

Trends in the US Hardwood Lumber Distribution Industry: Changing Products, Customers, and Services

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Abstract

Efficient and effective supply chains are the backbone of any industry, including the forest products industry. As the US secondary hardwood industry has undergone a profound transformation and large parts of the industry have moved offshore, the supply chain is adapting to these new realities. Remaining and new customers of US hardwood lumber distributors tend to be smaller and likely have a wide variety of unique needs and expectations. A survey conducted in the fall of 2008 of distributors of hardwood lumber assessed the sourcing needs and perceptions of the industry and describes the status of the industry as of 2007. The findings suggest that the US hardwood lumber industry is adapting to the new realities brought forth by the globalization of markets and slowing housing markets. Almost half of the respondents indicated that their average customer in 2007 was smaller than the average customer in 2003, and 75 percent of respondents indicated that the average order was smaller in 2007 versus 2003. To accommodate their customers, distributors added a plethora of new services, with provision of certified products being the fastest growing. Overall, the study depicts an ongoing transformation of the US hardwood lumber supply chain, where distributors are well positioned to meet the exacting specifications of numerous small and customized manufacturers.

Over the last two decades, ongoing economic globalization has brought considerable market share losses to manufacturers of hardwood products in the United States (Schuler et al. 2001; Buehlmann and Schuler 2002, 2009; Nwagbara et al. 2002; Becker 2003; Schuler and Buehlmann 2003; Quesada and Gazo 2006). Additionally, current economic turbulence has added to the challenges faced by the US hardwood value chain (Grushecky et al. 2006; Anonymous 2007; Buehlmann et al. 2007, 2008). While the economy seems to have reached a trough and is slowly recovering, the housing market, a critical driver for hardwood lumber producers, continues to reel from excessive inventories, foreclosures, and low demand for new construction.

US hardwood sawmills, which perform the first transformation in the hardwood value chain after logging by producing green or dried lumber, serve the secondary wood products industry including furniture, cabinetry, flooring, millwork, pallets, and railroad tie manufacturing. Other markets include the retail and export markets. US hardwood sawmill output dropped by 22 percent from 2004 to 2008, and while sales to traditional markets for hardwood lumber

like furniture (–46%) and cabinetry (–20%) declined, other market segments showed healthier growth (railroad ties, +22%; Hardwood Market Report 2009). This growth in lower value markets exemplifies the difficulty faced by sawmills in profitably procuring and processing higher grade logs and places more importance on efficient distribution systems to help reach customers in higher value market segments.

Despite the pronounced downturn in many hardwood markets, some evidence suggests that the smaller, customized manufacturing sector has fared better than the more traditional mass producers (Bumgardner et al. 2007,

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Buehlmann et al. 2008, Lihra et al. 2008). These smaller, customer-oriented manufacturers offer customized services and products and serve niche markets (Anderson 2006). Thus, they tend to face less competition from offshore producers and are able to make profits from small, special jobs with short lead times. While these small firms, which often focus on custom jobs in the residential, commercial, and public building construction markets, are widely dispersed throughout the nation, their hardwood lumber consumption on an individual basis is limited. However, their aggregate consumption is of increasing importance to hardwood lumber producers (Luppold and Bumgardner 2008). The dispersed and small nature of these firms requires specialized lumber delivery systems that allow for custom orders that may involve broken bundles, boards planed and/or sanded, sorted according to length, width, color, grain, and/or other characteristics, among other exacting requirements. Studies have documented the difficulties faced by very small secondary manufacturers in sourcing lumber to meet their specific needs (Kozak et al. 2003). While sawmills may not be equipped to profitably handle such small and diverse jobs, distribution yards appear to be well positioned as a key supply chain player to fulfill such orders.

Distribution yards are a marketing channel intermediary that take title to the goods traded, i.e., they buy, inventory, and resell lumber to manufacturers, retailers, or other wholesalers (Sinclair 1992). Marketing channels are characterized as an interorganizational system consisting of independent enterprises occupied with moving products, services, and/or ideas from the point of creation to the point of consumption (Stern and El-Ansary 1988). In the hardwood lumber industry, distribution yards specialize in the purchase of lumber to which they add value. Hardwood lumber distributors' yards (which can include NAICS 423310—Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers and NAICS 4441901—Lumber Retailing) provide services such as breaking and/or mixing bundles, sorting, drying, premanufacturing, and other value-added services for customers predominantly classified as secondary wood products manufacturers (NAICS 321 and 337, US Census Bureau 2007). Such third-party service providers might gain in importance as a higher share of the hardwood lumber output is consumed by smaller companies with specialized needs. The demand for customized lumber deliveries by these smaller manufacturers is in sharp contrast to the demands of the secondary wood products industries in the 20th century, when large furniture manufacturers bought green lumber by the truckload to be used at their extensive facilities, which were able to perform the necessary value-added steps in-house. However, distribution yards today are seemingly playing an increasingly important role in enabling the future competitiveness of hardwood-based manufacturing in the United States by providing an important link between lumber producers (sawmills) and lumber users. For example, distributors were found to be particularly important to furniture and cabinet producers in British Columbia for sourcing hardwood lumber to the exacting specifications required (Kozak et al. 2003).

To date, little research has been aimed specifically at the hardwood lumber distribution sector, which limits our understanding of the distribution yards' evolving role in

the hardwood industry. In fact, research from the early 1990s found that distribution yards were becoming less important as hardwood sawmills sought to shorten distribution channels, even as their customers requested increasingly specialized products and shorter lead times (Bush et al. 1991). However, there are reasons to believe that the hardwood lumber distribution function is changing; most notably, demand is increasing for services related to customized production, and such services are sought from more numerous small secondary manufacturers. The objective of this study was to identify trends in the hardwood lumber distribution industry, including the types of products and services being demanded and offered, changes in the customer base for hardwood lumber, and the perceptions of distribution yard managers concerning their emerging role in the hardwood lumber supply chain.

Materials and Methods

A mail survey involving all known hardwood lumber distribution enterprises in the United States was conducted. The questionnaire contained 27 questions and was accompanied by a cover letter explaining the study. Responses were tested for nonresponse bias, and the data were analyzed using statistical and graphical tools.

Questionnaire and data collection

Due to the large number of questions involved, Dillman's (1978) total design method was chosen as the best way to collect data. Some of the questions required internal data collection (Lees-Haley 1980), making the survey even more demanding on respondents. The questionnaire included five sections pertaining to (1) firm characteristics (five questions), (2) the distributor's operation (12 questions), (3) the distributor's customer base (three questions), (4) the distributor's suppliers (three questions), and (5) perceptions of the future of the hardwood distribution industry (four open-ended questions; although only one was included as results for this article). To obtain trend information, data from 2003 and 2007 were requested.

Information from the National Hardwood Lumber Association (NHLA), the North American Wholesale Lumber Association (NAWLA), and the Hardwood Distributors Association (HDA) was used to compile an encompassing address list for hardwood lumber distribution businesses in the United States. A total of 424 questionnaires were mailed, 388 in the United States, 32 to Canada, 3 to the United Kingdom, and 1 to Mexico. The foreign companies' addresses contained in the national associations' directories indicated that these companies conduct business in the United States. After correcting for undeliverable addresses (26) and respondents that indicated they were not in the hardwood lumber distribution business (10), the adjusted number of questionnaires mailed was 388. Four selected companies received the questionnaire and the cover letter as a pretest. After careful analysis of the returned pretest material, some minor adjustments were made to the questionnaire. The initial mailing started in August 2008 with a postage-paid return questionnaire accompanied by a cover letter, followed by a reminder postcard after 2 weeks. A second mailing, 2 weeks later, consisted of a postage-paid return questionnaire accompanied by a cover letter printed on light blue paper and was followed by a second reminder postcard. The survey concluded in October 2008. Sixty-nine

usable questionnaires were obtained for an adjusted response rate of 17.8%.

Data measures and analysis

In addition to questions related to firm characteristics, respondents were asked to indicate the species (domestic and imported) and market distribution of their sales for 2003 and 2007 (in percentages), as well as their hardwood lumber input and sales volumes for these 2 years (in board feet). They also were asked to indicate from predetermined lists (by the authors) what services they were offering and what services were being offered to them by their suppliers, as well as which of these were increasing in importance over the period. In terms of factors affecting their business in 2008, respondents were asked to rate a series of factors (selected by the authors) on a 7-point scale anchored by “no effect” and “major effect,” and also were asked two categorical response questions about the changes (or lack thereof) in order size and customer size experienced over the 2003 to 2007 period. Lastly, respondents answered an open-ended question regarding their perceptions of how their role as hardwood lumber distributors would change over the next 5 years.

After the closing of the survey, descriptive statistics were calculated first. When appropriate, statistical tests such as comparison of means (two-sample and paired *t* tests), chi-square tests, and tests of proportions were used (*z* tests). All tests were conducted at the 0.05 alpha level. Since the final number of usable responses was relatively small, outliers were analyzed to avoid skewing results excessively; one company’s lumber input and output data were excluded in that regard.

Assessment of potential nonresponse bias

To test for nonresponse bias, 31 nonrespondents were randomly selected and contacted after closing the survey (i.e., 3 months after the initial mailing) and asked to respond to a subset of questions from the original questionnaire (Malhotra 1996). Firm characteristics of nonrespondents were compared with those of companies that returned the questionnaire (Etter and Perneger 1997) for four characteristics: whether hardwood distribution was the sole business, species distribution, markets served, and lumber input. The proportion of both respondents (37.3%) and nonrespondents (41.9%) whose only business was hardwood lumber distribution was not significantly different ($P = 0.66$). A chi-square test of lumber purchases for 2007 across five categories (in million board feet [mmbf]: 1 to 5, 6 to 10, 11 to 15, 16 to 20, and 20+) also was not significantly different ($P = 0.16$), although respondents had a somewhat higher proportion in the 20+ mmbf category than did nonrespondents (22.9% vs. 6.5%). Thus, a degree of caution is warranted that the sample might have a slight overrepresentation of larger firms, although the overall distributions did not differ significantly. In terms of markets served, results were similar for both groups for species used (five investigated) and markets served (four investigated), with statistical differences occurring only for cherry (13.7% and 6.1%) and the furniture market (20.3% and 9.6%), respectively, with nonrespondents reporting a higher percentage on average in both cases (based on *t* tests). Thus, it was concluded that no major nonresponse bias

existed between survey respondents and nonrespondents, with the caveats noted above.

Firm characteristics

More than one-half of the respondents conducted business in a single facility (53%) and 37 percent of all respondents were solely in the hardwood lumber distribution business. On average, 63 percent (minimum 10%, maximum 100%) of respondents’ businesses were dedicated to hardwood lumber distribution, with the distribution of other wood products such as flooring, moulding, plywood, millwork, composites, and/or softwood lumber being other businesses respondents indicated being involved in. Additionally, a few respondents were involved in manufacturing (flooring, moulding, lumber), but fewer than five firms were involved in each of these individual categories. A few respondents also mentioned imports and exports as businesses that they pursue besides hardwood lumber distribution. The largest concentration of respondents was in the South (39%), followed by the Northeast (27%), the West (14%), the Midwest (13%), and 7 percent that were located outside the United States.

Study limitations

As with all mail surveys, limitations apply to the results obtained from this study (Alreck 2004). Most likely, results were obtained from a single person within each responding company. Although respondents mostly were owners and/or members of the senior management team, these respondents’ answers may not necessarily reflect the perspectives of other decisions-makers within the company. Also, because all respondents were members of at least one of the associations consisting of hardwood lumber distributors (NHLA, NAWLA, HDA) from whom addresses were obtained, caution is warranted in generalizing results discussed in this article to any nonmember companies. Since data were requested for the year 2007 and before, the slowing housing market and resulting economic slowdown most likely did not have as large an impact on respondents’ feedback as it might have if the study had been conducted the following year. Lastly, since part of the survey requested historical data from respondents, some of it up to 5 years old, this may have introduced a source of recall error in some of the data collected; however, the trend information uncovered by this study likely is valid.

Results and Discussion

Distributors’ hardwood lumber input and sales volume

As shown in Table 1, total sales volume of responding hardwood lumber distributors grew by 8 percent between 2003 and 2007 from 566 to 612 mmbf. Each distributor, on average, sold 12.0 and 12.8 mmbf hardwood lumber in 2003 and 2007, respectively, which was not statistically significant ($P = 0.22$). While the average sales volume increased by 7 percent between 2003 and 2007, the median sales volume decreased by 6 percent. Thus, sales increases were likely due to gains of a few, large hardwood distributors, with other participants losing sales.

The average US hardwood lumber distributor who responded to this survey purchased 12.0 mmbf of hardwood lumber in 2003, which grew to 13.2 mmbf in 2007, an increase of 10 percent (Table 1), but again not statistically

Table 1.—Average, standard deviation, median, and total volume for lumber purchased (input) and sold by distributors, 2003 and 2007 (n = 48).^a

	Lumber input			Lumber sales		
	2003 (mmbf)	2007 (mmbf)	Change (%)	2003 (mmbf)	2007 (mmbf)	Change (%)
Avg.	12.0	13.2	10	12.0	12.8	7
SD	12.1	11.1		8.8	9.6	
Median	10.1	10.0	-1	10.6	10.0	-6
Total	577.1	634.5	10	565.7	612.1	8

^a No significant difference between 2003 and 2007 for both lumber input and sales (paired *t* test, *P* = 0.13 and 0.22, respectively).

significant (*P* = 0.13). In the aggregate, responding hardwood lumber distributors purchased a total of 577 and 634 mmbf of lumber in 2003 and 2007, respectively. While the average purchase of hardwood lumber increased by 10 percent, the median purchase declined by 1 percent between 2003 and 2007, again indicating that growth in purchasing was not distributed evenly over all hardwood lumber distributors.

Species distribution

Red oak lost 33 percent in sales volume between 2003 and 2007 according to survey respondents (Fig. 1). Birch, basswood, cherry, and soft maple lost sales as well (-6%, -4%, -3%, and -2%, respectively). At the same time, ash, black walnut, beech, and hickory sales increased considerably (+88%, +88%, +86%, and +37%, respectively; Fig. 1). Other species, including aspen, gum, alder, cypress, and imported species gained as well (+41%), as did white oak (+8%) and yellow-poplar (+6%). Hard maple sales remained flat (±0%; Fig. 1). Changes for red oak and walnut were statistically significant (paired *t* test, *P* values of <0.001 and 0.003, respectively). There was also marginal evidence of differences for ash (*P* = 0.0698), hickory (*P* = 0.0882), and beech (*P* = 0.0640). These changes in species preferences are generally consistent with broader trends in lumber production for major species. For example, a study conducted by the Appalachian Hardwood Manufacturers (2008) found that oaks (red and white combined) represented 10 percent of the bedroom and dining room furniture displayed at the High Point, North Carolina, furniture market, while this figure was 20 percent 10 years earlier

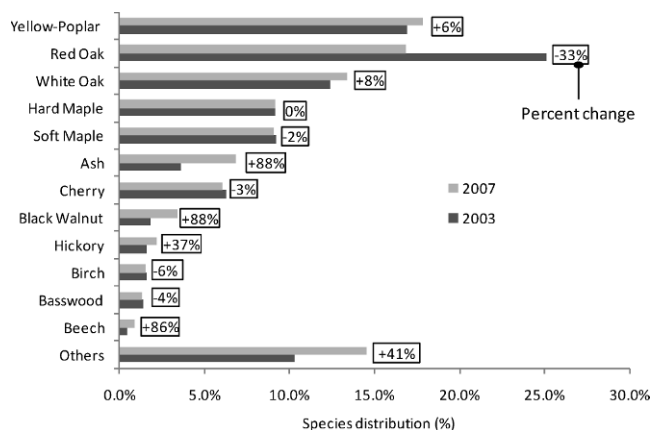


Figure 1.—Species distribution for typical respondent in 2003 and 2007 (board foot basis) and percent change (in boxes). Others includes aspen, gum, alder, cypress, and imported species.

(Luppold and Bumgardner 2007). During the same period, maple (hard and soft combined) remained relatively flat, falling to 9 percent from 10 percent.

Market distribution

With the ongoing realignment of industries due to changes in industrial policy (e.g., environmental considerations) and the globalization of economic activities (World Trade Organization 2008, Buehlmann and Schuler 2009), the importance of different industry segments to hardwood lumber distributors changed. Respondents' sales to the railroad tie industry segment grew by 103 percent from 2003 to 2007 (Fig. 2), although the share of this market on total sales was very small (0.5% in 2007). Retail (+40%), flooring (+34%), exports (+29%), millwork (+14%), and other (+23%) gained as well between 2003 and 2007 (Fig. 2). Furniture lost 37 percent of sales from 2003 to 2007, and cabinetry lost 3 percent. Statistically significant changes were found in furniture, flooring, retail, and other markets (paired *t* test, *P* values of 0.001, 0.025, 0.039, and 0.0548, respectively) and marginal evidence for millwork (*P* = 0.0823). The flat (i.e., unchanged) importance of the cabinet industry segment was a surprise because the industry generally was considered healthy until 2007, with strong demand from the new housing and remodeling markets. However, as Dicks (2008) observed, this finding might have been consistent with early signs of the coming recession.

Customer and order size

Forty-seven percent of respondents indicated that their average current customer (2007) was smaller than 5 years prior (2003), while 40 percent indicated that their customers' size stayed about the same (Table 2). Only 12 percent of

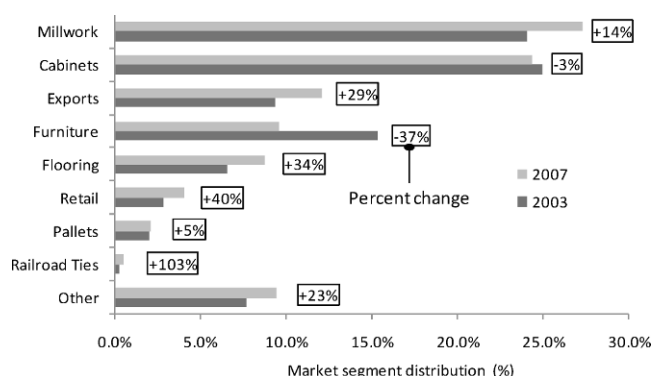


Figure 2.—Percentage of lumber going into different market segments for respondents in 2003 and 2007 (board foot basis) and percent change (in boxes).

Table 2.—Changes perceived by responding distributors (n = 68) in their average customer size and order size, 2003 to 2007.

Customer size (%)		Order size (%)	
Smaller	47	Decreased	75
Larger	12	Increased	12
About the same	40	About the same	13
Not sure	1	Not sure	0

respondents responded that their current customers were larger and 1 percent was not sure. However, 75 percent of all respondents indicated that the average order size (board feet) had decreased over the past 5 years, 13 percent indicated that average order size had remained about the same, and 12 percent stated that their average order size had increased over the past 5 years.

Smaller customer size and smaller order size may be related to the ongoing exodus of wood products manufacturing capacity from the United States (Buehlmann and Schuler 2009) in three ways. First, manufacturers moving capacity overseas are predominantly large businesses that can establish long-distance supply chains. Second, with larger manufacturers now coping with longer foreign supply chains and significantly increased lead times, smaller domestic shops that directly serve customers with customized products may be able to pick up some of the business that was previously covered by larger manufacturers. Finally, the results may indicate that more distributors are responding to “just-in-time” requirements of their customers.

Sales of imported lumber

Sales of imported lumber comprised 9.2 percent of respondents’ total sales in 2007 on average, up from an average of 6.9 percent in 2003, or a 33.3 percent increase. However, not all hardwood distributors responding to this survey were involved in selling imported hardwood lumber; 44.7 and 47.4 percent of respondents, respectively, said they imported species in 2003 and 2007, a 6 percent increase. For those who imported, the percentage of their total sales from imported lumber was, on average, 15.3 and 19.3 percent for 2003 and 2007, e.g., a 26 percent increase from 2003 to 2007.

Mahogany lost market share between 2003 and 2007. Respondents’ sales of mahogany dropped from 55.8 percent of imported lumber sales to 43.1 percent (based on 35 respondents) while sapele increased from 5.1 percent in 2003 to 15.3 percent in 2007 (based on 29 respondents). Similarly, European beech increased from 6.8 percent in 2003 to 10.1 percent in 2007 (23 respondents). Other imported species commonly reported were jatoba, purple heart, padauk, zebrawood, African mahogany, and Spanish cedar. The changes reported were statistically significant only for sapele and mahogany (paired *t* test, *P* values of 0.005 and 0.005, respectively).

Services offered by suppliers

Survey respondents were asked an open-ended question about requests for new services, “What new services are your hardwood lumber customers requesting?” Fourteen respondents stated “width-related”; 12 indicated “color sorting”; 11 mentioned “finishing/sanding”; six each wrote “length-related” and “grade/defect-related”; five each

wrote “S4S” and “JIT [just-in-time] or short-notice shipments”; three each indicated “other dimension-related,” “smaller orders,” and “wider range of products”; and two each wrote “mixed loads” and “sap- or bark-free.”

Similarly, on a predetermined list of 16 services, distributors were asked, “Please indicate the services that your company offered in 2003 and 2007. Also, please indicate if the services offered increased in importance to customers from 2003–2007.” Figure 3 shows the frequency of services offered by respondents in 2003 and in 2007, the change in frequency from 2003 to 2007, and the percentage of respondents who indicated that the service increased in importance between 2003 and 2007.

Surfacing two sides of the lumber (S2S) was the most frequently offered service in 2007 by hardwood lumber distributors who responded to this survey. In 2007, 76 percent of respondents offered this service, followed by quick delivery (73%), break bundles (72%), and just-in-time deliveries (72%). Other value-added services, such as special grading, double end trim, color sorting, width sorting, or surfacing four sides (S4S) was also offered by more than half of all respondents in 2007.

In 2003, only eight of the responding firms provided certified products to their customers. By 2007, 29 did so, an increase of 21 providers or 263 percent. Thus, offering certified products was the fastest growing service offered by hardwood lumber distributors between 2003 and 2007, followed by finishing (+133%), custom moulding (+100%), and priming (e.g., applying a first coat of finishing to the material; +100%). Width sorting was the only service that was offered less frequently in 2007 compared with 2003, declining by 29 percent or 16 companies. However, 59 percent of respondents indicated that width sorting had increased in importance to customers from 2003 to 2007. Possibly, width sorting has become an expectation for which customers are not willing to pay a premium. Thus, hardwood lumber distributors may have reduced emphasis on the service, despite knowing that width sorting is a service with increased importance.

The survey also asked hardwood lumber distributors to “. . . select the services that your suppliers offered in 2003 and 2007” from the same list of 16 services. Between 2003 and 2007, the number of suppliers offering certified products grew by 313 percent, from 8 to 33, followed by

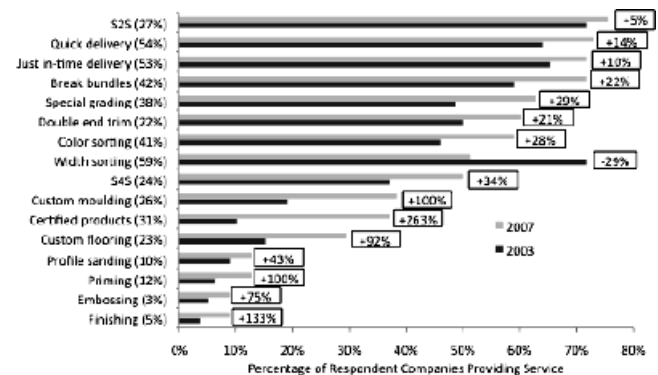


Figure 3.—Frequency of services offered by responding distributors in 2003 and 2007 (bars) and percent change (in boxes). Also, percentage of responding companies indicating that a particular service increased in importance (in parentheses behind service name).

an increase of just-in-time deliveries (+89%, from 18 to 34), break bundles (+83%, 12 to 22), priming (+75%, 4 to 7), color sorting (+67%, 21 to 35), and quick delivery (+52%, 21 to 32). The remaining services offered by suppliers to hardwood lumber distributors had growth rates below 50 percent or declined such as width sorting (-26%, 39 to 29). Figure 4 shows the frequency of services offered by suppliers to hardwood lumber distributors and the change in frequency from 2003 to 2007.

Factors affecting the hardwood lumber distribution business

Respondents were asked to rate 18 factors that might currently be affecting their hardwood lumber distribution business on a 7-point scale anchored by 1 (no effect) and 7 (major effect). Average ratings for this question are shown in Figure 5. Although the survey specifically asked for answers for 2007, it appears that the housing market collapse, which was gathering steam when this survey was conducted in 2008, influenced the answers from respondents. The slowing housing market received the most attention (mean = 6.0) by respondents as the factor affecting the hardwood lumber distribution business, followed by fuel costs (5.4), changing customer demand (4.7), energy costs for production (4.6), and lumber costs (4.5). All other factors received average ratings below 4.5, with branding of hardwood lumber (2.6) and carrier-required backhauls (2.5) being rated as the least important factors. Respondents were also given space to indicate other factors that they believed affected the hardwood lumber distribution business. Factors listed included log availability, taxes, credit crisis, health care, exchange rates, government waste, quality of staff, and slow payments.

Future of the hardwood lumber distribution business

Respondents were asked, "How do you feel the role of hardwood lumber distributors will change in the next five years?" Responses to this open-ended question were categorized as follows: wider product range (11 responses); customization (8); smaller orders (7); improved services (6); faster service, concentration/consolidations, and certification (4 each); customer-orientation and diverse inventory (3 each); and efficiency and flexibility (2 each). As the US wood products industry is adapting to the globalization of

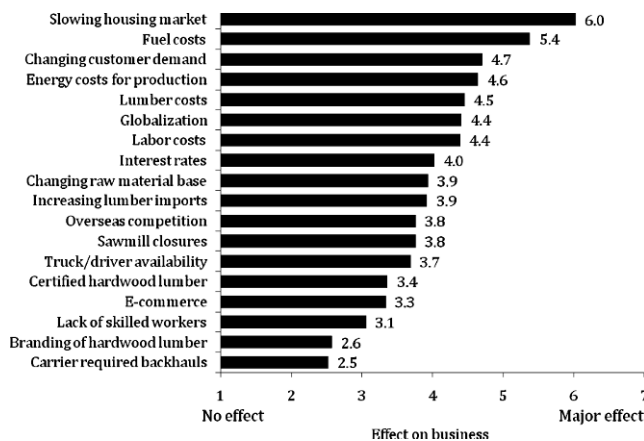


Figure 5.—Factors affecting hardwood lumber distribution business (scale anchors: 1 = no effect, 7 = major effect). Standard deviations ranged from 1.3 for slowing housing market and labor costs to 2.0 for overseas competition.

markets and the large, vertically integrated manufacturers of wood products (especially furniture) are being replaced by smaller, local producers of customized products, distributors are seemingly emphasizing the need to facilitate wider product ranges, customized manufacturing, and placement of smaller orders. To be competitive, smaller manufacturers need to obtain limited quantities of specific products with short lead times at a reasonable price to satisfy their customers and make a profit.

Summary and Conclusions

In 2007, the average lumber distributor purchased 13.2 mmbf and sold 12.8 mmbf of hardwood lumber. These amounts were up modestly since 2003, but the increases were not statistically significant. However, it is noteworthy that overall US hardwood lumber production was down by 1.4 billion board feet (bbf) (-12%) over the same period (Hardwood Market Report 2009), suggesting that distributors are becoming increasingly important in the hardwood supply chain. Sales of red oak by lumber distributors declined by 33 percent from 2003 to 2007, while sales of walnut increased. Sales of imported species grew overall, but there were species differences. Mahogany dropped 55.8 percent from 2003 to 2007, while sales of sapele increased by 200 percent.

For hardwood lumber distributors, sales to the furniture industry declined by 37 percent while sales to the flooring industry increased by 34 percent. Interestingly, sales to retail outlets also grew significantly, although the overall volume remained relatively small. However, this latter trend does suggest the increasing importance of small and even hobby users of hardwood lumber as globalization and slow housing markets take their toll on demand from larger furniture, cabinet, and other hardwood consuming companies. It is also noteworthy that "other" markets have become increasingly important relative to traditional markets, including sales to other distributors. Importantly, almost half of the respondents indicated that their current average customer is smaller today than in 2003, and a full 75 percent indicated that the average order size in 2007 was smaller than it was 5 years earlier. The former figures seem to indicate that customers are becoming smaller in size, which seemingly is an important reflection of a shift in the

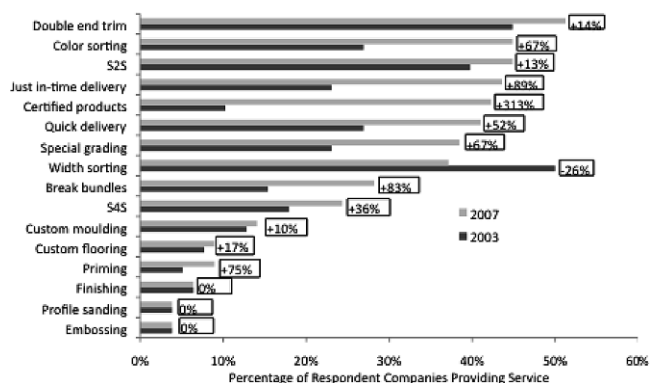


Figure 4.—Frequency of services offered by suppliers to responding hardwood lumber distributors in 2003 and 2007 (bars) and percent change (in boxes).

domestic industry toward smaller, more specialized manufacturers.

Providing certified products was the fastest growing service offered by respondents in 2007, growing 263 percent between 2003 and 2007. However, hardwood lumber distributors also added finishing, custom moulding, priming, special grading, custom flooring, and other services to their repertoire to accommodate customer needs. Suppliers to the hardwood lumber distributors, too, added services to accommodate their clientele. Providing certified products was the fastest growing service (+313%) provided by suppliers to hardwood lumber distributors, followed by just-in-time deliveries, breaking bundles, priming, and color sorting, among other services. Increased demand by secondary manufacturers for specialized products and just-in-time deliveries, as found in the current study, are a continuation of trends seen emerging in the early 1990s (Bush et al. 1991). However, at that time, the role of distributors was seen as becoming less important since mills were attempting to shorten distribution channels. Today, distribution yards seem well positioned to help fulfill these demands, which increasingly come from smaller, more flexible secondary manufacturers and also from larger firms that have turned to mass customization strategies as a means of competing with low-cost offshore production.

Hardwood lumber distributors indicated that their future success depends on offering a wider product range, offering environmentally friendly/certified products, filling smaller and more exacting orders, and faster service. These are important developments, demonstrating the evolving role of distribution in enabling a competitive domestic manufacturing base. The results also show the continuing pressures on the US industry from the globalization of economies.

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Literature Cited

- Alreck, P. L. 2004. *The Survey Research Handbook*. Vol. xxv. 3rd ed. McGraw-Hill/Irwin, Boston. 463 pp.
- Anderson, C. 2006. *The Long Tail*. Hyperion, New York. 238 pp.
- Anonymous. 2007. Special report. In the shadow of prosperity—Trade's victims. *The Economist* 382:29.
- Appalachian Hardwood Manufacturers. 2008. Furniture makers utilize more solids, veneers. *Appalachian Hardwood Manufacturers*, High Point, North Carolina. 7 pp.
- Becker, D. 2003. The fight to furnish. Special report. Made in China—A two-day series focusing on the impact of global competition in the triad. *Greensboro News and Record*. March 1. p. A1.
- Buehlmann, U., M. Bumgardner, A. Schuler, and M. Barford. 2007. Assessing the impacts of global competition on the Appalachian hardwood industry. *Forest Prod. J.* 57(3):89–93.
- Buehlmann, U., M. Bumgardner, A. Schuler, and J. Crissey. 2008. Managing the downturn. *Modern Woodworking*. April. pp. 40–49.
- Buehlmann, U. and A. Schuler. 2002. Benchmarking the wood household furniture industry in a global market. *Wood Digest*. November. pp. 52–57.
- Buehlmann, U. and A. Schuler. 2009. The U.S. household furniture manufacturing industry in 2008—Status and opportunities. *Forest Prod. J.* 59(9):20–28.
- Bumgardner, M., R. Romig, and W. Luppold. 2007. Wood use by Ohio's Amish furniture cluster. *Forest Prod. J.* 57(12):6–12.
- Bush, R. J., S. A. Sinclair, and P. A. Araman. 1991. A qualitative investigation of competition in the U.S. hardwood lumber industry. *Forest Prod. J.* 41(11/12):43–49.
- Dicks, G. 2008. The U.S. recession. *Econ. Outlook* 4(10):1–4.
- Dillman, D. A. 1978. *Mail and Telephone Surveys: The Total Design Method*. John Wiley & Sons, New York. 325 pp.
- Etter, J.-F. and T. V. Perneger. 1997. Analysis of non-response bias in a mailed health survey. *J. Clin. Epidemiol.* 50:1123–1128.
- Grushecky, S. T., U. Buehlmann, A. Schuler, W. Luppold, and E. Cesa. 2006. Decline in the US furniture industry: A case study of the impacts to the hardwood lumber supply chain. *Wood Fiber Sci.* 38(2):365–376.
- Hardwood Market Report. 2009. 2008: The year at a glance—12th annual statistical analysis of the North American hardwood marketplace. *Hardwood Market Report*, Memphis, Tennessee. 78 pp.
- Kozak, R. A., T. C. Maness, and T. Caldecott. 2003. Solid wood supply impediments for secondary wood producers in British Columbia. *Forestry Chron.* 79(6):1107–1119.
- Lees-Haley, P. R. 1980. *The Questionnaire Design Handbook*. Lees-Haley Associates, Huntsville, Alabama. 103 pp.
- Lihra, T., U. Buehlmann, and R. Beauregard. 2008. Mass customization of wood furniture as a competitive strategy. *Int. J. Mass Customisation* 2(3/4):200–215.
- Luppold, W. and M. Bumgardner. 2007. Examination of lumber price trends for major hardwood species. *Wood Fiber Sci.* 39(3):404–413.
- Luppold, W. and M. Bumgardner. 2008. Forty years of hardwood lumber consumption: 1963 to 2002. *Forest Prod. J.* 58(5):6–12.
- Malhotra, N. K. 1996. *Marketing Research: An Applied Orientation*. Prentice Hall, Upper Saddle River, New Jersey. 890 pp.
- Nwagbara, U., U. Buehlmann, and A. Schuler. 2002. Impact of globalization on North Carolina industries: The case of the furniture industry. Research report. North Carolina Department of Commerce, Policy, Research, and Strategic Planning Division and North Carolina State University, Raleigh. 45 pp.
- Quesada, H. J. and R. Gazo. 2006. Mass layoffs and plant closures in the U.S. wood products and furniture manufacturing industries. *Forest Prod. J.* 56(10):101–106.
- Schuler, A. and U. Buehlmann. 2003. Identifying future competitive business strategies for the U.S. residential wood furniture industry: Benchmarking and paradigm shifts. General Technical Report NE-304. USDA Forest Service, Northern Research Station, Newtown Square, Pennsylvania. 18 pp.
- Schuler, A., R. Taylor, and P. Araman. 2001. Competitiveness of U.S. wood furniture manufacturers—Lessons learned from the softwood moulding industry. *Forest Prod. J.* 51(7/8):14–20.
- Sinclair, S. A. 1992. *Forest Products Marketing*. McGraw-Hill, New York. 403 pp.
- Stern, L. W. and A. I. El-Ansary. 1988. *Marketing Channels*. 3rd ed. Prentice-Hall, Englewood Cliffs, New Jersey.
- US Census Bureau. 2007. 2007 NAICS definitions. <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007>. Accessed June 13, 2009.
- World Trade Organization. 2008. What is the WTO? <http://www.wto.org/>. Accessed April 5, 2008.