

# Assessing the impacts of global competition on the Appalachian hardwood industry

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## Abstract

The membership of the Appalachian Hardwood Manufacturers, Inc. was surveyed in 2005 to determine the perceived impacts of globalization on large Appalachian sawmills. While much has been written regarding the impacts of globalization on secondary manufacturing, less is known about primary links in the hardwood supply chain. The results suggested that globalization issues ranked among the most important concerns of sawmill managers. More than 90 percent of respondents indicated that they were working harder to develop relationships with their customers as a result of globalization, and 75 percent indicated that they were now more aggressive in searching for new markets. Respondents indicated that export and flooring markets had picked up some of the volume loss associated with declining domestic furniture manufacturing, but these markets (particularly flooring) were perceived to be vulnerable to imports. Lumber sorting seemed to be an important area for capital investment for responding firms in the coming years. Training priorities that are suggested by these findings include communications and marketing while technology development priorities might include lumber sorting and decision-support tools.

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While much has been written regarding the decline in residential wood furniture manufacturing in the United States (e.g., Schuler and Buehlmann 2003), less attention has been paid to the impacts on suppliers to this and other secondary hardwood markets that are affected by globalization. The influences of globalization are numerous; these can include low-cost production of goods manufactured overseas, differing exchange rates, competition from foreign hardwood suppliers in domestic and export markets, as well as others. Increasingly, U.S. hardwoods are competing with temperate hardwoods from around the world (Hardwood Review 2003, Bowe et al. in press). The U.S. hardwood lumber industry realized declining annual production levels during a four-year period from 1999 to 2003 (Luppold 2006), due in part to mill closures and consolidation related to globalization forces. Data concerning hardwood lumber use over this period indicate that use by the furniture sector faced the steepest decline (-38%) while the cabinet and flooring sectors experienced increases (+17% and +7%, respectively) (Hardwood Market Report 2004).

Hardwood sawmill managers face other concerns in addition to globalization. Issues such as energy and transportation

costs, log and logger availability, timber quality, stumpage costs, and changes in domestic markets such as housing also are challenges that mill managers must address, often on a day-to-day basis. An assessment of the hardwood industry's utilization research needs conducted in the mid-1990's (National Hardwood Lumber Association 1996) did not explicitly mention globalization; however, the competitive environment has changed since that time. Knowledge of globalization's importance relative to other management challenges can be useful in determining training priorities for companies and industry research needs.

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The common denominator to most forest-based industries is the use of wood as the primary raw material input. The efficient use of this renewable resource can only be achieved if there are a variety of products that can be made from wood. By understanding trends and competitive positions in all sectors of the supply chain, a comprehensive approach to maintaining a viable forest products industry can be developed. The objective of this research was to determine the impacts of globalization on primary processors in the Appalachian hardwood region, an important link in the hardwood supply chain. The Appalachian region, as defined by Luppold and Bumgardner (in press) accounts for over 55 percent of the hardwood lumber produced in the eastern United States (USDC Bureau of the Census 2005).

### Data collection and sample description

The membership of the Appalachian Hardwood Manufacturers, Inc. (AHMI) was surveyed in the late summer and fall of 2005 to assess the impacts of globalization on larger sawmills in the Appalachian region. The membership of this organization numbers 53 sawmills. A test questionnaire was sent to 14 companies in July of 2005. Few changes were made as a result of the pretest. The first bulk mailing of the questionnaire (i.e., sent to the remaining AHMI member companies) occurred in August of 2005; all nonrespondents were sent a second questionnaire one month later. A total of 32 usable questionnaires were returned (5 test responses, 13 early responses, 14 late responses) for an overall response rate of 60.4 percent. Nearly 41 percent of the respondents were the CEO, President, or Owner of their company; 22 percent were the General Manager; and 12.5 percent each were the Vice President or the Sales Manager.

The average respondent had 169.7 employees (median = 98.0). Over 56 percent operated multiple facilities. Nearly 69 percent produced only hardwood lumber while 16 percent produced unfinished components and lumber. A small number of respondents also produced semifinished or finished components, flooring, moulding, and/or millwork along with hardwood lumber.<sup>1</sup> Nearly 85 percent of respondents had annual hardwood lumber production of 6 MMBF or more (nearly 41 percent exceeded 15 MMBF annually), which was consistent with overall Association figures. The state breakdown included nine respondents from West Virginia, seven from North Carolina, five from Virginia, three each from Kentucky and New York, and the remaining five respondents were located in Pennsylvania, Ohio, Tennessee, or Georgia.

<sup>1</sup> The multiple facility mills and mills producing products in addition to lumber likely pushed the mean (and median) number of employees higher than what would be expected for individual sawmill operations alone. Inclusion of truck drivers and loggers also might have affected reported mill employment in some cases.

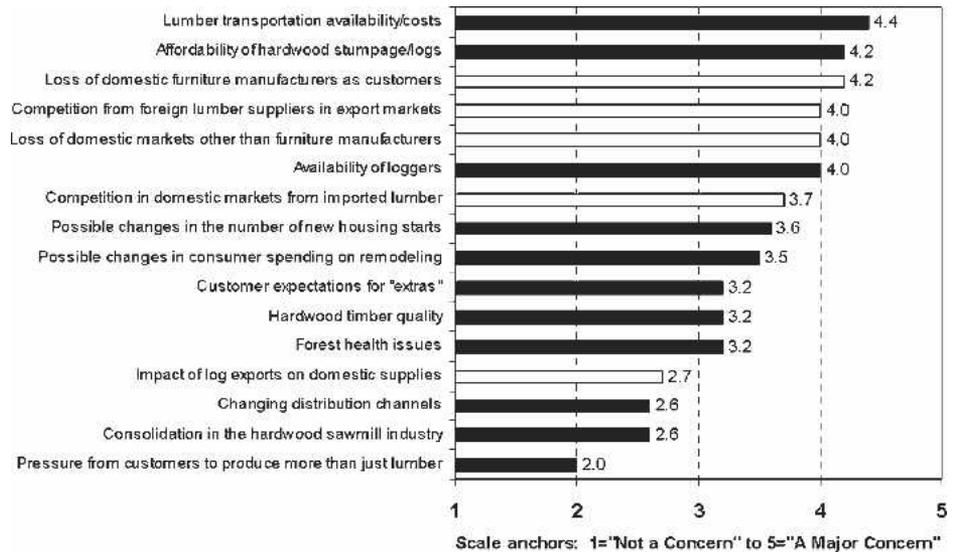


Figure 1. — Mean responses to level of concern over several issues potentially affecting the hardwood supply chain and markets. Standard errors of the means ranged from 0.13 to 0.21. Unshaded bars are those issues related to globalization.

As a check for nonresponse bias, early respondents were compared to late respondents on employment and lumber production, with the assumption that late respondents were similar to nonrespondents. Neither test was significant (Wilcoxon rank sum test  $p$ -value = 0.92 for employment and chi-square test  $p$ -value = 0.79 for lumber production), suggesting that nonresponse bias was not a significant factor in the study.

## Results and discussion

### Concerns over hardwood markets and supply chains

Respondents were asked to indicate their level of concern over several issues potentially affecting hardwood supply chains and markets. The issues chosen for inquiry were diverse and included several related to globalization, along with forest health issues, timber availability and quality, and day-to-day management of business operations. The results are shown in **Figure 1**. Table 1 While most of the globalization issues tended to be rated as somewhat major concerns, other high-scoring concerns included lumber transportation availability/costs, affordability of hardwood stumpage and logs, and availability of loggers<sup>2</sup>. Among the globalization issues, only the impact of log exports on domestic supplies was rated as a relatively minor concern. It was interesting that hardwood timber quality and forest health issues were rated more moderately as concerns and somewhat lower than several other issues. Overall, issues related to lumber transportation and raw material availability were at least as concerning to respondents as were globalization issues such as loss of domestic and export markets.

When asked separately which of the issues listed in **Figure 1** concerns them most for next year, 11 respondents indicated lumber transportation availability/costs, 6 respondents indicated loss of domestic furniture manufacturers as customers,

<sup>2</sup> The "globalization issues" were qualitatively assigned by the authors; it is recognized that other issues such as transportation costs also are indirectly related to globalization, as high fuel costs partially reflect increasing global demand.

and another 6 respondents indicated affordability of hardwood stumpage/logs. The remaining responses were scattered among availability of loggers ( $n = 2$ ), changes in housing starts ( $n = 2$ ), competition in domestic markets from imported lumber ( $n = 1$ ), loss of domestic markets other than furniture manufacturers ( $n = 1$ ), and competition from foreign lumber suppliers in export markets ( $n = 1$ ). Two respondents provided no usable answer.

Similarly, when asked what was most likely to be of greatest concern in three years, responses were more diverse. The leading issues were competition from foreign lumber suppliers in export markets, loss of domestic markets other than furniture, and affordability of hardwood stumpage/logs (five respondents each). These were closely followed by the issues of loss of domestic furniture manufacturers as customers and possible changes in the number of new housing starts (four respondents each). Remaining responses were scattered among consolidation in the hardwood sawmill industry ( $n = 2$ ), competition in domestic markets from imported lumber ( $n = 2$ ), lumber transportation availability/costs ( $n = 1$ ), availability of loggers ( $n = 1$ ), and customer expectations for “extras” ( $n = 1$ ). Two respondents provided no usable answer.

### Impacts of globalization on sales and marketing

Several potential impacts of globalization were investigated (Fig. 2). Not surprisingly, respondents were in strong agreement that lumber sales to furniture companies have declined over the past three years. Perhaps more alarming, they agreed almost as strongly that other markets might go the way of the furniture industry. Furthermore, there was fairly strong agreement that it is increasingly difficult to sell hardwood lumber. Impacts related to specific market segments are highlighted in Figure 2; it seems that exports and flooring have picked up more of the slack in lumber markets formerly dominated by furniture than have cabinets and moulding/millwork. In addition, respondents indicated they have rebounded from

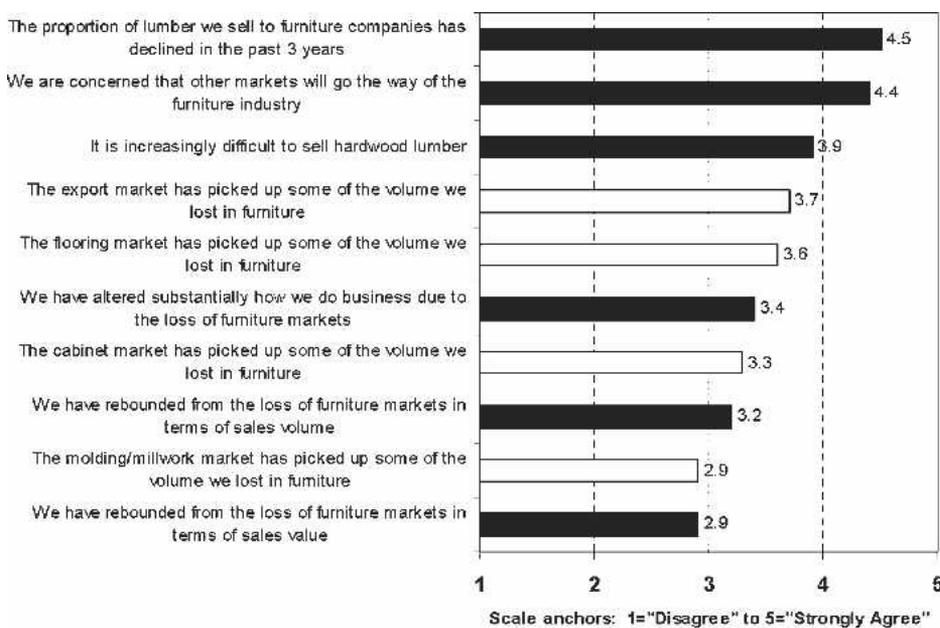


Figure 2. — Mean responses to level of agreement with several statements concerning the impacts of globalization on sales and marketing. Standard errors of the means ranged from 0.14 to 0.22. Unshaded bars are those issues related to specific markets for hardwood lumber.

the loss in furniture markets more favorably in terms of lumber sales *volume* than sales *value*; however, agreement was only moderate in both cases. This seems to make intuitive sense given flooring is a lower value product, on average, than furniture, and much of the growth in export markets has come from China, which is generally a low-price market.

When asked to describe qualitatively the impacts that domestic furniture manufacturing decline has had on the ability to sell specific grades and species, many respondents indicated that No. 1 Common red oak lumber was harder to sell. Others mentioned that No. 1 and No. 2 Common grades in general were affected across species. Poplar and ash also were mentioned by a few respondents as specific species that were now harder to sell in addition to red oak. Some respondents mentioned that green lumber sales to domestic furniture companies had been lost. Several companies indicated that they now rely more on export markets.

### Vulnerability of domestic markets

Respondents were asked to rate the major markets for hardwood lumber (excluding furniture) as to their perceived vulnerability to imported finished products. As shown in Figure 3, flooring was rated as the most vulnerable. Pallets and millwork were rated as the least vulnerable while cabinets, exports, and moulding were rated as somewhat to moderately vulnerable. Given the importance of flooring in picking up some of the volume lost to the furniture market (Fig. 2), this perceived vulnerability seems to pose an important challenge.

### Actions taken in response to globalization

Respondents were asked to indicate which of several actions they had undertaken to deal with globalization, as shown in Figure 4. More than 90 percent indicated that they work harder to develop relationships with customers, which was the most frequently cited action. Perhaps one manifestation of this is that nearly 44 percent of respondents also had developed

new grading criteria for specific customers. Also prominent among the actions taken were being more aggressive in searching for new markets (75.0%) and investing in new equipment (71.9%). Sorting services also scored somewhat highly; interestingly, percentages were identical for length and width sorting (62.5%) but slightly lower for color sorting (53.1%). More than 40 percent had hired or contracted with an overseas sales representative. Nearly 47 percent indicated that they are more flexible in delivery schedules and have shortened their lead times, and another 30 percent carry more finished inventory at the mill; these two changes might indicate that secondary manufacturers are adopting leaner manufacturing strategies and opting for more just-in-time deliveries, which ultimately affects sawmills. Collectively, it seems that sorting, flexible delivery, short lead times, and proprietary grade rules point to a wide-ranging

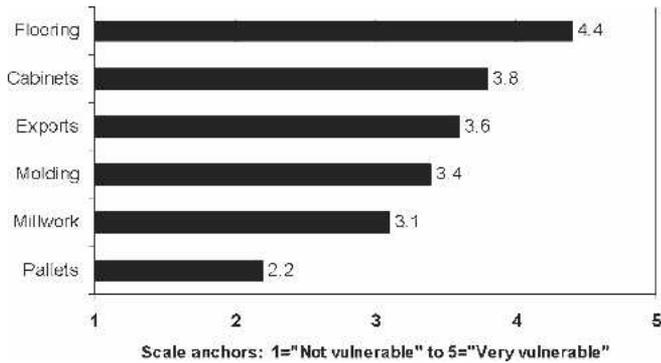


Figure 3. — Mean responses to perceived vulnerability of secondary markets to imported finished products. Standard errors of the means ranged from 0.13 to 0.23.

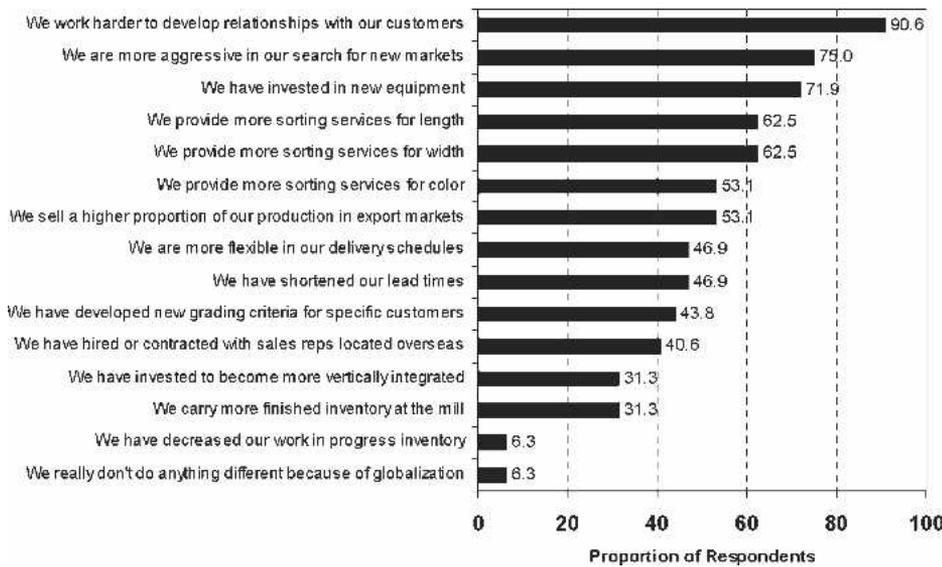


Figure 4. — Proportion of respondents that have undertaken each action to deal with globalization in hardwood markets.

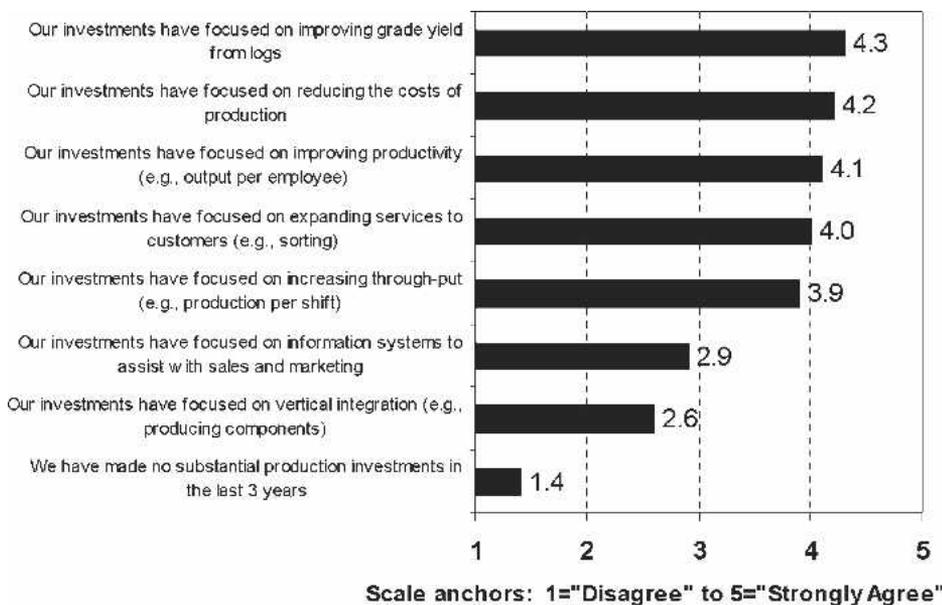


Figure 5. — Mean responses to level of agreement with several statements concerning the impacts of globalization on capital investments. Standard errors of the means ranged from 0.13 to 0.24.

effort to be more responsive to customer needs. Only 6 percent indicated that they do nothing different as a result of globalization.

Respondents also were asked to qualitatively describe elements of a successful strategy for U.S. hardwood lumber companies in the global economy. Emerging themes from this question included good product quality, an increasing focus on export markets, niche marketing and targeting specific customers, developing better relationships with customers (as one respondent indicated, “willing to meet customers in their place of business”), and becoming more cost conscious along with reducing costs. The term “flexibility” also was mentioned several times. Respondents were then asked if they had implemented the things they listed. Most responded in the affirmative; the few negative responses were attributed to a lack of capital and organizational resistance to change.

### Impacts of globalization on capital investments

Respondents were asked to indicate the impacts of globalization on capital investment at their companies. As shown in Figure 5, similar (and relatively high) ratings were given to improving yield from logs, reducing production costs, improving productivity, expanding services such as sorting, and increasing throughput. Lower ratings occurred for information systems for sales and marketing and vertical integration. On average, respondents disagreed that their mills had made no substantial production investments in the last three years. Separately, half of respondents indicated they planned to spend more than \$1 million in capital improvements over the next three years.

### Areas for capital improvements

Lastly, respondents were asked in what areas their companies will spend significant money to improve productivity or capabilities. As shown in Figure 6, lumber sorting was cited the most frequently, by 53 percent of respondents. This seems to represent a shift from 1999, when a national survey of the hardwood sawmill industry indicated that only 7 percent of mills had automated sorting technology in place at that time (Bowe et al. 2001). Among other areas for capital improvement, sawing was cited by 44 percent of respondents and lumber scanning and log scanning were cited by 37 percent and 34 percent of respondents, respectively.

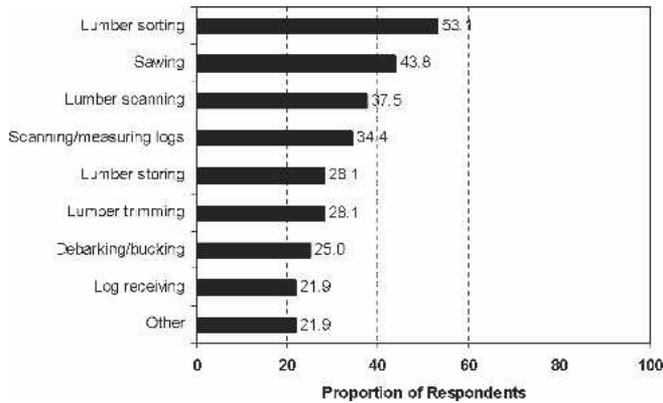


Figure 6. — Proportion of respondents that will spend significant amounts in each area to improve productivity or capabilities in the United States.

### Summary discussion

The results of this study suggest that hardwood lumber companies are concerned about more than just globalization. However, loss of markets, both those already gone (e.g., furniture) and those that might be lost in the future, are prominent among their concerns. Concerns surrounding transportation costs and log availability rivaled globalization, at least at the time of this study. Longer-term concerns shifted more toward housing starts, loss of domestic markets beyond furniture, and foreign competition in export markets, although log affordability remained a long-term concern as well. The export and flooring markets have picked up some of the volume loss caused by the decline of U.S. furniture manufacturing, but these markets (particularly flooring) are perceived to be vulnerable to imported products and do not always replace lost value. Marketing approaches, such as customer relationships and new market development, and manufacturing approaches, such as investment in equipment to reduce costs and improve yield and productivity, are being pursued to deal with globalization in the hardwood lumber industry. Nearly every respondent (more than 90%) indicated that they were working harder to develop relationships with their customers, and three out of four respondents indicated that they were more aggressive in searching for new markets.

Investments in lumber sorting, which can address both customer relationships and manufacturing improvements, seemingly will be a high priority for many larger Appalachian sawmills in the coming years. Others also have noted a trend toward production of more width-sorted hardwood products (Hardwood Review 2006). This likely reflects a desire by secondary manufacturers to reduce waste and more efficiently convert their raw materials; such manufacturers might prefer to buy lumber from mills providing sorting services. Demand for sorted products might also be the result of a shift to more customized products by secondary manufacturers, which requires more exacting specifications. The trend toward customization and other value-added options is likely to continue as a response to competition from low-wage foreign manufac-

turers and to strong demand for upscale housing and remodeling activity from aging baby boomers. Similar to the residential construction industry, the basis for competition for domestic hardwood suppliers might shift from a model of providing commodity-like products to helping customers find solutions to their increasingly specific manufacturing needs (Schuler et al. 2005).

These results also can lead to identification of potential training and research priorities. For example, in order for suppliers to get closer to their customers, suppliers may need training to develop better listening and relationship-building skills. Likewise secondary manufacturers may need to develop better communication skills. There likely will need to be more of a focus on marketing and new market development than on selling what the mill can produce. For example, a new proprietary grade may allow a flooring manufacturer to profitably tap into a new market opportunity in luxury housing; the supplier will need to work with the flooring manufacturer to produce this grade. In determining whether investment in sorting technology to meet specific customer-developed grading needs is economically attractive, computer and other analytic tools will be needed to help answer the “what if” questions, calculate rates of return, etc. Furthermore, both suppliers and secondary manufacturers will need the tools and information necessary to clearly understand their own cost structures.

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