# Domestic competitiveness in secondary wood industries

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**Abstract**

As imports capture a substantial portion of the domestic wood furniture market, there is much speculation and concern as to the future of this and related industries. This study sought to obtain an industry perspective of trends in domestic manufacturing and importing, and to identify factors that might enhance domestic competitiveness. A mail survey was conducted between August and November of 2002 involving manufacturers in three secondary industry sectors and in two employment size categories randomly selected from the distribution list of a major wood products trade publication. Results indicate that perspectives as to the current and future state of the domestic industry differ by firm type and firm size, as do some opinions on ways to enhance the competitive situation of domestic manufacturers. This information can be used to assess the import pressures specific sectors and company sizes are experiencing and to develop plans for survival in an increasingly global marketplace.

Many wood products industries in the United States are facing ever-increasing pressure from foreign competition. For example, there are indications that many major U.S. manufacturers of residential furniture may have lost their competitive edge and little evidence exists that a turnaround is in the making. In fact, a leading trend has been for U.S. manufacturers to close domestic plants and substitute components or complete lines of furniture with imported products. Foreign manufacturers, led by China, Canada, and Italy, have nearly doubled their share of the U.S. wood household furniture market since 1990 (Buehlmann et al. 2003). Approximately 40 percent of all wood household furniture sold in the United States was imported from foreign countries in 2001 and the trend is upward (**Fig. 1**). This estimate of import share is derived from data furnished by the U.S. Department of Commerce (2002); it is calculated by dividing imports by consumption, where consumption is equal to shipments plus imports minus exports (based on value in U.S. dollars). It is important to note that consumption is probably overstated because some imported components and finished furniture is likely included in domestic shipments, resulting in a conservative estimate of import share.

While the impact of imports on the U.S. residential wood furniture market has been especially pronounced, imports have also increased their share of the market for wood office furniture, wood kitchen cabinets, and upholstered furniture (**Fig. 1**). Some reasons for domestic market share losses include increasing globalization exposing companies previously sheltered from international competition, improvements in containerized shipping technology that lower transportation costs and reduce damage, a U.S. economy that has outperformed the rest of the world thereby attracting foreign products, and lower wage and regulation costs in many parts of the world (Buehlmann and Schuler 2002). In view of such trends, it is not surpris-

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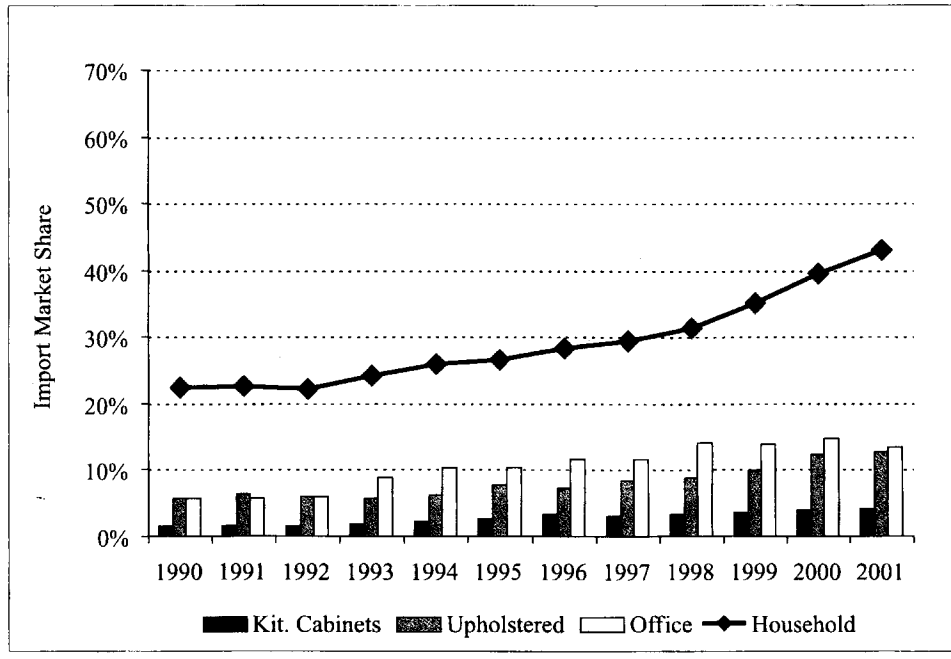


*Figure 1. — Import market shares in the United States for wood kitchen cabinets, upholstered furniture, wood office furniture, and wood household furniture, 1990 to 2001.*

ing that many observers question what the future holds for wood products industries in the United States (e.g., Hardwood Review Weekly 2003). Numerous entities maintain a keen interest in the viability of secondary wood manufacturers beyond these companies themselves, including suppliers and local and state officials to name a few. For example, the furniture and cabinet sectors accounted for approximately 32 percent of domestic hardwood lumber consumption in the late 1990s (Hansen and West 1998).

Several ideas for improving domestic competitiveness in the household furniture industry have been discussed in the literature (e.g., Hoff et al. 1997, Schuler et al. 2001, Buehlmann and Schuler 2002, Bullard 2002, Bullard and West 2002, Schuler and Buehlmann 2003). There are also reports of companies taking steps to enhance their competitiveness through implementation of various actions, including customization and shorter lead times (e.g., Morse 2002). However, there is little information concerning how industry representatives feel about proposed solutions for residential furniture and other globally challenged wood manufacturing sectors.

The objectives of this research were to: 1) obtain industry perspectives of emerging trends in domestic manufacturing and importing; and 2) identify factors that can enhance domestic competitiveness. Given the different impacts that imports are having on various sectors (**Fig. 1**), the research was designed to allow comparisons between several firm types. Comparisons between smaller and larger companies also were of interest. Small firms and large firms each have certain advantages that may help them be globally competitive (Hoff et al. 1997, Bullard and West 2002).

## Methods

### Data collection

Prior to the survey, an undeclared pretest was conducted by mailing the questionnaire to companies listed in the 2001 Wood 100, an annual list compiled by *Wood and Wood Products* magazine of secondary wood products firms with the largest growth in sales from the previous year (Freund and Maffia 2001). Thirty questionnaires were returned in the pretest, and these returns gave little evidence of difficulty in completing the questionnaire. However, a few minor adjustments were made involving question wording and overall questionnaire layout.

The initial mailing list for the survey contained 2,100 firms, randomly drawn from the distribution list for *Wood and Wood Products* magazine, which contains over 50,000 persons at over 30,000 locations and is geared toward the furniture, fixtures, millwork, and cabinet industries. The vast majority of companies on the distribution list are located in the United States. The magazine is published monthly and was established in 1896. Stratified sampling was employed, with the mailing list being split between household furniture (HF), kitchen and bath cabinets (KBC), and office/hospitality/contract furniture (OHC) manufacturers. The sample was further stratified by size to include those firms with 20 to 99 employees (small firms) and those firms with 100 or more employees (large firms).

Initially, an attempt was made to stratify proportionally (equal number of small and large firms within each product type, or 350 per stratification), but some strata were not adequately represented in the sampling frame to achieve this. Approximately 350 firms were randomly selected within each stratum for small HF, large HF, small KBC, and large OHC firms; 130 large KBC and 508 small OHC firms also were randomly selected for inclusion in the mailing list, reflecting their relative presence in the sampling frame. Two questionnaire/cover letter mailings and a reminder postcard were sent as part of the survey in August and September of 2002. The questionnaire mailings included postage-paid return envelopes.

The number of usable questionnaires returned was 341. After adjusting for non-deliverable addresses, firms out of business, and firms not actually manufacturing the products of interest, the re-

*Table 1. — Responses (counts with column percentages in parentheses) to whether companies have increased use of wood imports in their product lines over the last 5 years.*[a]

| | Small HF | Large HF | Small OHC | Large OHC | Small KBC | Large KBC | Total |
|---|---|---|---|---|---|---|---|
| Imported finished products | 4 (7.7) | 8 (14.6) | 5 (5.1) | 2 (4.1) | 4 (6.7) | 1 (3.7) | 24 |
| Imported components | 10 (19.2) | 2 (3.6) | 11 (11.2) | 10 (20.4) | 7 (11.6) | 8 (29.6) | 48 |
| Both | 7 (13.5) | 23 (41.8) | 9 (9.2) | 10 (20.4) | 4 (6.7) | 2 (7.4) | 55 |
| No | 31 (59.6) | 22 (40.0) | 73 (74.5) | 27 (55.1) | 45 (75.0) | 16 (59.3) | 214 |
| Total | 52 (100.0) | 55 (100.0) | 98 (100.0) | 49 (100.0) | 60 (100.0) | 27 (100.0) | 341 |

[a]Chi-square = 57.6; $p < 0.01$.

sponse rate was 18 percent. Sixty-two percent of the sample had less than 100 employees and 59 percent generated less than $10 million in sales in 2001. The sample breakdown by firm category was as follows: small HF = 52; large HF = 55; small OHC = 98; large OHC = 49; small KBC = 60; and large KBC = 27.

To test for nonresponse bias, responses to two questions were analyzed by comparing respondents to the first ($n$ = 177) and second ($n$ = 164) questionnaire mailings. This procedure assumes that persons responding to the second wave did so because of the increased stimulus and are therefore similar to nonrespondents (Armstrong and Overton 1977). It was possible that firms with a high level of concern regarding threats posed by imports were more likely to respond than less concerned firms. The first question asked how committed the company was to maintaining a domestic manufacturing presence using a seven-point response scale (1 = not at all committed; 7 = very committed). The second question asked the extent to which respondents agreed with a statement that by the end of the decade little will remain of domestic wood furniture and other wood products manufacturing in the United States (the response categories were strongly agree, agree, disagree, strongly disagree, and not sure).

For the first question, there was no evidence of significant differences between the two groups ($t$ = 0.66, $p$ = 0.51). Likewise, there was no evidence to support significant differences between groups on the second question (chi-square = 3.21, $p$ = 0.52). From these results, it was concluded that nonresponse bias was not a significant factor in the survey. However, it should be noted that the sampling frame was comprised of subscribers to *Wood and Wood Products* magazine. It is possible that subscribers are different from non-subscribers, so caution is warranted in generalizing beyond the population of *Wood and Wood Products* subscribers.

### Data analysis

An alpha level of 0.10 was chosen for all tests. Questions regarding emerging trends in domestic manufacturing and importing (Objective 1) were primarily structured with categorical responses. These questions were analyzed using chi-square tests for independence with firm category. A significant result indicated that there was dependence between firm category and the categorical variable in question, or stated another way, that there were differences among firm categories.

Questions regarding factors that can enhance domestic competitiveness (Objective 2) were grouped into four sets of scaled items. The scaled items were chosen by the authors and based largely on previous literature, although some new ideas were also incorporated. Multivariate analysis of variance (MANOVA) was used to determine if overall differences existed between the two levels of firm size (small and large) and three levels of firm type (HF, KBC, OHC), with the item sets serving as the dependent variables in four separate MANOVA analyses. In each set, the dependent variables exhibited moderate positive correlation, suggesting appropriate use of MANOVA (Malhotra 1996). When a significant MANOVA result was obtained, an analysis of variance (ANOVA) was performed on each dependent variable to determine the source(s) of differences. When a significant ANOVA result was obtained, the Tukey-Kramer test was used to determine differences in adjusted group means.

Prior to analysis, responses were transformed (row centered) in each set of items by subtracting the individual's average score from each item's score (Schaninger and Buss 1986) and adding a constant so that all transformed data had a positive value (Malhotra 1996). This transformation was carried out because individuals may perceive and use scales of importance differently (Woodside et al. 1988), e.g., they may use only the lower or upper half of the scale or restrict responses to near the scale midpoint. Since the interest was in potential *relative* differences between groups and not absolute differences, no data information was lost in this transformation (Moriarty and Reibstein 1986). In essence, this procedure places all respondents on "equal footing" as to their answers to scale questions.

## Results and discussion

### Trends in domestic manufacturing and importing

*Increased use of wood imports.* — Respondents were asked, "Over the last 5 years, have you increased use of wood imports in your product line?" Statistically, there was a significant difference among the firm categories. There are several interesting trends apparent in **Table 1**. First, with the exception of small HF, small companies were more likely to have not increased use of imports over the last 5 years compared to large companies. Second, increased use of imported finished products alone was generally low across all firm categories (less than 15%). Lastly, large HF manufacturers were especially likely to have increased the use of both imported finished products and components in their product lines. Large HF firms were the only firm category to exhibit a higher proportion of imported finished products compared to imported components. This could reflect that HF products often require little customization and thus can be imported from the lowest cost supplier. An inherent danger is that firms may become channel intermediaries that could quickly lose relevance if foreign manufacturers develop marketing and distribution systems adequate to bypass their domestic business partners.

*Lost business due to imports.* — Respondents were asked, "Over the last 5 years, have you lost significant business

*Table 2. — Responses (counts with column percentages in parentheses) to whether companies have lost significant business over the last 5 years due to imports.*[a]

| | Small HF | Large HF | Small OHC | Large OHC | Small KBC | Large KBC | Total |
|---|---|---|---|---|---|---|---|
| Yes | 21 (40.4) | 36 (65.4) | 36 (37.5) | 19 (39.6) | 11 (18.3) | 2 (7.7) | 125 |
| No | 25 (48.1) | 10 (18.2) | 48 (50.0) | 22 (45.8) | 44 (73.4) | 22 (84.6) | 171 |
| Not sure | 6 (11.5) | 9 (16.4) | 12 (12.5) | 7 (14.6) | 5 (8.3) | 2 (7.7) | 41 |
| Total | 52 (100.0) | 55 (100.0) | 96 (100.0) | 48 (100.0) | 60 (100.0) | 26 (100.0) | 337 |

[a]Chi-square = 49.8; $p < 0.01$.

*Table 3. — Estimates (counts with column percentages in parentheses) of the percent of sales that will come from domestically produced and/or sourced products in 3 years.*[a]

| | Small HF | Large HF | Small OHC | Large OHC | Small KBC | Large KBC | Total |
|---|---|---|---|---|---|---|---|
| 0% to 40% | 7 (13.5) | 6 (10.9) | 4 (4.1) | 6 (12.5) | 1 (1.7) | 0 (0.0) | 24 |
| 41% to 80% | 6 (11.5) | 16 (29.1) | 23 (23.5) | 9 (18.8) | 6 (10.3) | 4 (14.8) | 64 |
| 81%+ | 33 (63.5) | 25 (45.5) | 59 (60.2) | 29 (60.4) | 40 (69.0) | 19 (70.4) | 205 |
| Don't know | 6 (11.5) | 8 (14.5) | 12 (12.2) | 4 (8.3) | 11 (19.0) | 4 (14.8) | 45 |
| Total | 52 (100.0) | 55 (100.0) | 98 (100.0) | 48 (100.0) | 58 (100.0) | 27 (100.0) | 338 |

[a]Chi-square = 25.5; $p = 0.04$.

*Table 4. — Planned level of spending (counts with column percentages in parentheses) on capital improvements over the next 3 years, small firms and large firms.*

| | HF | KBC | OHC | Total |
|---|---|---|---|---|
| Small firms[a] | | | | |
| < $500 K | 42 (80.8) | 38 (64.4) | 60 (63.8) | 140 |
| $500 K to $1 M | 8 (15.4) | 17 (28.8) | 22 (23.4) | 47 |
| > $1 M | 2 (3.8) | 4 (6.8) | 12 (12.8) | 18 |
| Total | 52 (100.0) | 59 (100.0) | 94 (100.0) | 205 |
| Large firms[b] | | | | |
| < $1 M | 21 (42.0) | 10 (37.0) | 31 (64.6) | 62 |
| $1 M to $5 M | 19 (38.0) | 12 (44.5) | 11 (22.9) | 42 |
| > $5 M | 10 (20.0) | 5 (18.5) | 6 (12.5) | 21 |
| Total | 50 (100.0) | 27 (100.0) | 48 (100.0) | 125 |

[a]Chi-square = 7.2; $p = 0.13$.
[b]Chi-square = 7.4; $p = 0.12$.

due to imports?" As shown in **Table 2**, there was a statistically significant difference among the firm categories. Most notably, KBC firms, both small and large, were most likely to respond with "no" (73.4% and 84.6%, respectively). Large HF firms were most likely to indicate that they had lost significant business to imports, with over 65 percent answering "yes" and another 16.4 percent indicating that they were "not sure." Small HF, small OHC, and large OHC were very similar in their responses, with approximately one-half indicating that they had not lost significant business to imports.

*Commitment to domestic manufacture.* — Respondents were asked, "How committed is your company to maintaining a domestic manufacturing presence?" Responses were based on a scale ranging from 1 = not at all committed to 7 = very committed. There were no differences among firm categories (ANOVA $p$-value = 0.48), but commitment was generally rated quite high (overall mean of 6.1). This suggests an overall general desire to keep at least a portion of their manufacturing in the United States. However, as the responses to the questions above demonstrate, different industry sectors achieve this desire with mixed success.

*Sales from domestic production/sourcing.* — There was a statistically significant difference among the firm categories concerning the percent of sales expected to come from domestically produced and/or sourced products in 3 years (**Table 3**). Large HF firms were substantially less likely than the others to expect a large proportion of sales (more than 80%) to be generated from domestically produced and/or sourced products. The results indicate that KBC manufacturers (especially small KBC) are less certain about the future in this regard than are HF and OHC manufacturers, but still expect the largest proportion of their sales to be composed of domestic products.

*Capital investment.* — Respondents were asked how much money they planned to spend on capital improvements of U.S. manufacturing plants over the next 3 years. **Table 4** shows that there were no statistically significant differences among small firms or large firms, respectively, across firm type, although the $p$-values of the chi-square tests were near the significance level.

*Future of the domestic industry.* — Respondents were presented with the following statement and question; "Many industry observers predict that by the end of the decade, little will remain of domestic wood furniture and other wood products manufacturing in the United States. Looking at trends in your company's market segment, do you:" with five response categories as shown in **Table 5**. There was a statistically significant difference among the firm categories. Generally, HF firms were the most likely to agree with the statement, especially large HF firms,

*Table 5. — Level of agreement (counts with column percentages in parentheses) with a statement suggesting that little will remain of wood furniture and other wood products manufacturing in the United States by the end of the decade.*[a]

| | Small HF | Large HF | Small OHC | Large OHC | Small KBC | Large KBC | Total |
|---|---|---|---|---|---|---|---|
| Strongly agree | 13 (26.5) | 13 (24.1) | 14 (14.7) | 7 (14.3) | 4 (6.8) | 0 (0.0) | 51 |
| Agree | 10 (20.4) | 20 (37.0) | 19 (20.0) | 9 (18.4) | 6 (10.2) | 9 (33.3) | 73 |
| Disagree | 14 (28.6) | 9 (16.7) | 25 (26.3) | 18 (36.7) | 25 (42.4) | 11 (40.8) | 102 |
| Strongly disagree | 7 (14.3) | 8 (14.8) | 23 (24.3) | 8 (16.3) | 14 (23.7) | 5 (18.5) | 65 |
| Not sure | 5 (10.2) | 4 (7.4) | 14 (14.7) | 7 (14.3) | 10 (16.9) | 2 (7.4) | 42 |
| Total | 49 (100.0) | 54 (100.0) | 95 (100.0) | 49 (100.0) | 59 (100.0) | 27 (100.0) | 333 |

[a]Chi-square = 39.9; $p = 0.01$.

*Table 6. — MANOVA results and dependent variable ANOVA for importance of factors to companies wishing to maintain a strong domestic manufacturing presence.*[a] *Variables listed in approximate order of rated importance.*

| MANOVA | Wilks' λ *p*-value |
|---|---|
| Interaction | 0.99 |
| Firm size | 0.27 |
| Firm type | 0.08 |

| ANOVA for dependent variables | Mean | Mean | Mean | |
|---|---|---|---|---|
| *Firm type* | HF | KBC | OHC | *p*-value |
| Better product quality | 5.9 | 5.9 | 5.9 | 0.96 |
| More timely delivery to customers | 5.8 | 5.8 | 6.0 | 0.14 |
| Better control over manufacturing[b] | **5.6** | **5.5** | **5.3** | **0.05** |
| Quality of the workforce | 5.0 | 5.2 | 5.3 | 0.17 |
| Closer interaction between marketing/design and manufacturing | 5.2 | 5.0 | 5.0 | 0.26 |
| Less shipping damage to product | 5.1 | 5.1 | 5.2 | 0.89 |
| Closer to end-markets | 4.9 | 4.5 | 4.7 | 0.19 |
| Commitment to the community | 4.4 | 4.6 | 4.4 | 0.33 |
| Reduced need for warehousing | 4.4 | 4.5 | 4.7 | 0.18 |
| Opportunities for workforce education | 4.3 | 4.6 | 4.5 | 0.26 |
| Public relations/promotional advantages | 4.3 | 4.2 | 4.0 | 0.19 |

[a]Based on the following scale: 1 = not at all important to 7 = very important.
[b]Based on the Tukey-Kramer test, there are two groups: (HF, KBC) (KBC, OHC).

with over 60 percent of large HF firms either agreeing or strongly agreeing. Large HF firms and large KBC firms were more likely to agree with the statement than were their smaller counterparts, but none of the large KBC firms strongly agreed.

## Factors that can enhance competitiveness

The MANOVA results are shown in **Tables 6** through **9**, along with the adjusted group means. Three of the four MANOVA tests were significant.

*Factors inherent to a strong domestic manufacturing base.* — As shown in **Table 6**, there was a significant firm type effect when respondents were asked to rate the importance of several factors inherent to maintaining a strong domestic manufacturing presence. The subsequent dependent variable ANOVAs indicated that the source of this effect was *better control over manufacturing*, which HF firms rated as significantly more important than did OHC firms. Overall, *better product quality* and *more timely deliveries to customers* were rated as the most important while *public relations/promotional advantages* was rated as the least important.

*Potential themes for industry-wide promotion.* — Respondents were asked, "In your opinion, if an industry-wide promotion campaign for domestically produced furniture and cabinets were to be initiated, which of the following points should it focus on for maximum effect?" The ratings of the scale items are shown in **Table 7**. There was a significant firm type effect. The subsequent dependent variable ANOVAs indicated that the source of this effect was *the tradition of American furniture manufacturing* and *use of environmentally certified wood*. HF firms agreed more with the manufacturing tradition theme than did OHC firms, while OHC firms agreed most with the environmental certification theme. Overall, *quality of construction* was the theme with the highest agreement rating while *use of environmentally certified wood* was rated lowest.

Perhaps a Made in America theme has some justification. When asked "In your opinion, do the majority of consumers generally know where their furniture or cabinets were made?" respondents were generally in agreement that customers

*Table 7. — MANOVA results and dependent variable ANOVA for focus of industry-wide promotion campaign for domestically produced furniture and cabinets to achieve maximum effect.[a] Variables listed in approximate order of rated importance.*

| MANOVA | Wilks' λ *p*-value |
|---|---|
| Interaction | 0.18 |
| Firm size | 0.57 |
| Firm type | 0.07 |

| ANOVA for dependent variables | Mean | Mean | Mean | |
|---|---|---|---|---|
| *Firm type* | HF | KBC | OHC | *p*-value |
| Quality of construction | 5.7 | 5.8 | 5.8 | 0.47 |
| A "Made in America" theme and logo | 5.6 | 5.3 | 5.4 | 0.26 |
| Quality of materials used | 5.4 | 5.4 | 5.4 | 0.99 |
| The tradition of American furniture manufacturing[b] | **5.0** | **4.9** | **4.7** | **0.05** |
| Use of familiar U.S. species | 4.7 | 4.8 | 4.7 | 0.63 |
| The tradition of American furniture designs | 4.5 | 4.6 | 4.4 | 0.65 |
| Use of environmentally certified wood[c] | **4.2** | **4.2** | **4.6** | **0.01** |

[a]Based on the following scale: 1 = strongly disagree to 7 = strongly agree.
[b]Based on the Tukey-Kramer test, there are two groups: (HF, KBC) (KBC, OHC).
[c]Based on the Tukey-Kramer test, there are two groups: (OHC) (HF, KBC).

*Table 8. — MANOVA results for helpfulness of public sector assistance to firms wishing to maintain a strong domestic manufacturing presence.[a] Variables listed in approximate order of rated importance.*

| MANOVA | Wilks' λ *p*-value |
|---|---|
| Interaction | 0.50 |
| Firm size | 0.89 |
| Firm type | 0.43 |

| Dependent variables included | Overall mean |
|---|---|
| Better tax treatment for capital improvements | 5.9 |
| Low interest loan program for capital improvements | 5.6 |
| More information on new manufacturing technologies and processes | 5.3 |
| More information on market trends | 5.0 |
| More favorable exchange rates | 5.0 |
| Tariffs on imported products | 4.6 |
| More information on import/export statistics | 4.3 |
| Import quotas | 4.3 |

[a]Based on the following scale: 1 = not at all helpful to 7 = very helpful.

do not know where their furniture or cabinets are made (53.7% said no, 10.3% were not sure). Statistically, there were no differences between firm categories (chi-square = 13.2, $p = 0.21$)

*Public sector assistance.* — Respondents were asked to rate how helpful several types of public sector assistance would be to firms wishing to maintain a strong domestic manufacturing presence. As shown in **Table 8**, no significant effects were found. All firm types and sizes were in general agreement on the helpfulness of public sector assistance. Overall, *better tax treatment for capital improvements* was rated as the most helpful, while *import quotas* and *more information on import/export statistics* were rated as least helpful. In general, financial types of assistance were rated as most helpful, while protection policies were rated as least helpful. Information assistance was rated somewhere in the middle.

*Enhancing competitiveness.* — Respondents were asked to rate the potential of several factors to enhance the competitiveness of companies wishing to maintain a strong domestic manufacturing presence. **Table 9** shows that there were significant firm size and firm type effects. Large firms rated *realization of shorter lead times* as having higher potential than did small firms, while small firms rated *greater use of outsourced labor* as having higher potential than did large firms. With regard to firm type, HF firms rated *production of customized products* as having less potential than did KBC and OHC firms. KBC firms rated *workforce training/education* as having more potential than did HF and OHC firms. Finally, OHC firms rated *greater use of outsourced labor* as having more potential than did KBC firms to enhance domestic competitiveness.

## Conclusions

The results suggest that HF firms, especially large HF firms, are facing the most import pressures. Compared to the other firm categories, large HF firms were the most likely to: 1) have increased use of wood imports in their product lines over the past years (60.0%); 2) lost significant business to imports over the last 5 years (65.4%); and 3) agree that little will remain of the domestic industry by the end of the decade (61.1%). Nearly half of small HF firms also agreed with this view of the future. In addition, only 45.5 percent of large HF firms indicated that more than 80 percent of sales would come from domestically produced and/or sourced products in 3 years.

*Table 9. — MANOVA results and dependent variable ANOVA for potential of factors to enhance the competitiveness of companies wishing to maintain a strong domestic manufacturing presence.[a] Variables listed in approximate order of rated importance.*

| MANOVA | Wilks' λ *p*-value |
|---|---|
| Interaction | 0.13 |
| Firm size | 0.06 |
| Firm type | 0.05 |

| ANOVA for dependent variables | Mean | Mean | |
|---|---|---|---|
| *Firm size* | small | large | *p*-value |
| Realization of shorter lead times | **5.7** | **6.0** | **0.02** |
| Technological innovations in the plant | 5.5 | 5.7 | 0.13 |
| Innovations in product design | 5.5 | 5.5 | 0.71 |
| Greater use of lean manufacturing techniques | 5.3 | 5.5 | 0.16 |
| Production of customized products | 5.5 | 5.4 | 0.82 |
| Workforce training/education | 5.1 | 5.1 | 0.56 |
| Greater use of outsourced materials | 4.8 | 4.9 | 0.74 |
| Development of wider brand awareness | 4.7 | 4.7 | 0.74 |
| Greater use of consumer research | 4.7 | 4.5 | 0.25 |
| Company promotion efforts | 4.6 | 4.6 | 0.76 |
| Industry-wide promotion efforts | 4.5 | 4.5 | 0.69 |
| Greater use of outsourced labor | **4.3** | **3.8** | **<0.01** |

| ANOVA for dependent variables | Mean | Mean | Mean | |
|---|---|---|---|---|
| *Firm type* | HF | KBC | OHC | *p*-value |
| Realization of shorter lead times | 5.8 | 5.7 | 5.9 | 0.42 |
| Technological innovations in the plant | 5.5 | 5.8 | 5.5 | 0.18 |
| Innovations in product design | 5.5 | 5.6 | 5.4 | 0.46 |
| Greater use of lean manufacturing techniques | 5.4 | 5.2 | 5.5 | 0.30 |
| Production of customized products[b] | **5.1** | **5.8** | **5.5** | **<0.01** |
| Workforce training/education[c] | **4.9** | **5.4** | **5.0** | **0.01** |
| Greater use of outsourced materials | 4.9 | 4.7 | 4.9 | 0.37 |
| Development of wider brand awareness | 4.9 | 4.6 | 4.6 | 0.13 |
| Greater use of consumer research | 4.7 | 4.5 | 4.6 | 0.56 |
| Company promotion efforts | 4.7 | 4.6 | 4.5 | 0.54 |
| Industry-wide promotion efforts | 4.6 | 4.5 | 4.4 | 0.48 |
| Greater use of outsourced labor[d] | **4.1** | **3.98** | **4.2** | **0.07** |

[a]Based on the following scale: 1 = low potential to 7 = high potential.
[b]Based on the Tukey-Kramer test, there are two groups: (KBC, OHC) (HF).
[c]Based on the Tukey-Kramer test, there are two groups: (KBC) (OHC, HF).
[d]Based on the Tukey-Kramer test, there are two groups: (OHC, HF) (HF, KBC).

KBC firms seemed to be facing the least pressure from imports. Small KBC firms and large KBC firms were the least likely to have lost significant business to imports over the last 5 years, with 73.4 and 84.6 percent answering "no" to this question, respectively. Small and large KBC firms also reported that a higher percentage of sales (more than 80%) would come from domestically produced and/or sourced products in 3 years compared to the other firm categories at 69.0 percent and 70.4 percent, respectively.

Overall, responding firms indicated a strong commitment to maintaining a domestic manufacturing presence. However, many also agreed that the domestic industry would be smaller by the end of the decade. Taken together, this seems to suggest that while individual firms are committed to some form of domestic manufacture, they still worry that the industry at large is not positioned to follow up on such a commitment, or that commitment alone may not ensure domestic competitiveness.

Several interesting differences were found among firm types concerning factors to enhance competitiveness. HF firms rated control over manufacturing as more important than did OHC and KBC firms. This may be an indication that they have enough experience with importing to know that at least some control over manufacturing is lost when imported products and/or components are incorporated into the product mix. HF firms also would put more emphasis on the tradition of American manufacturing than would OHC firms, perhaps because household furniture is generally a more mature product type than are OHC products.

HF firms did not see the potential in customized products that KBC and OHC firms did. Perhaps this indicates that HF firms recognize the ability of foreign competitors to mimic "customized" products. It could also reflect a commodity mentality on the part of HF manufacturers, or that HF manufacturing facilities are not set up to expedite changes in product designs and materials. It also may be that KBC firms are already farther down the customization road than are HF firms, as evidenced by the variety of styles, species, and finishes consumers can now choose from at big box retailers.

KBC firms see the greatest potential in workforce training and education. Perhaps this reflects a higher level of automation and computerized processes in cabinet facilities compared to HF facilities, and more customized products compared to OHC products. OHC firms saw more potential in outsourcing labor than did KBC firms. This might coincide with KBC firms' higher rating for the potential of workforce training. OHC firms also saw the highest potential in promotion of environmentally certified wood, which might reflect their primarily corporate customer base, as opposed to HF and KBC firms that sell more to consumers. Some corporations are under increasing pressure to purchase environmentally certified products and may be more open to such products.

Small firms rated use of outsourced labor as having higher potential to enhance competitiveness than did large firms. Perhaps this suggests that smaller firms struggle to recruit, hire, and retain qualified workers, and would prefer to avoid some of the hassles of being an employer. Large firms see more potential in reducing lead times as a means to enhance competitiveness than do small firms.

Across all firm types and sizes, more information on new manufacturing technologies and market trends was rated as more helpful than more information on import/export statistics, maybe suggesting that firms already understand import/export developments given the current amount of information available. It also may indicate a primarily domestic market mentality. The relatively low rating of protection-type policies suggest that many companies would prefer to receive financial and information assistance. Quality, timeliness, and innovation in manufacturing and design were recurrent themes that emerged as especially important to domestic competitiveness.

## Literature cited


Armstrong, J.S. and T.S. Overton. 1977. Estimating nonresponse bias in mail surveys. J. of Marketing Research 14(3):396-402.

Buehlmann, U. and A. Schuler. 2002. Benchmarking the wood household furniture industry: A basis for identifying competitive business strategies for today's global economy. *In*: Proc. of the NHLA 30th Annual Hardwood Symp. NHLA, Memphis, TN. pp. 122-128.

_____, M. Bumgardner, A. Schuler, and R. Christianson. 2003. How can the U.S. wood products industry compete? Wood and Wood Prod. 108(1):37-46.

Bullard, S.H. 2002. Innovate or evaporate . . . business concept innovation in the furniture industry in the age of information. Bull. FP228. Forest and Wildlife Research Center, Mississippi State Univ., Mississippi State, MS. 8 pp.

_____ and C.D. West. 2002. Furniture manufacturing and marketing: Eight strategic issues for the 21st century. Bull. FP227. Forest and Wildlife Research Center, Mississippi State Univ., Mississippi State, MS. 24 pp.

Freund, B. and J. Maffia. 2001. 12th annual WOOD 100 report. Wood and Wood Products 106(10):61-92.

Hansen, B. and C. West. 1998. Trends in domestic/export hardwood markets. *In*: Proc. of the NHLA 26th Annual Hardwood Symposium. NHLA, Memphis, TN. pp. 1-9.

Hardwood Review Weekly. 2003. The forest products industry in peril. Hardwood Review Weekly 19(20):1,21,23.

Hoff, K., N. Fisher, S. Miller, and A. Webb. 1997. Sources of competitiveness for secondary wood products firms: A review of literature and research issues. Forest Prod. J. 47(2): 31-37.

Malhotra, N.K. 1996. Marketing Research: An Applied Orientation. Prentice Hall, Upper Saddle River, NJ.

Moriarty, R.T. and D.J. Reibstein. 1986. Benefit segmentation in industrial markets. J. of Business Research 14:463-486.

Morse, D. 2002. Tennessee producer tries new tactic in sofas: Speed. The Wall Street J. November 19:A1,A20.

Schaninger, C.M. and W.C. Buss. 1986. Removing response-style effects in attribute determinance ratings to identify market segments. J. of Business Research 14:237-252.

Schuler, A. and U. Buehlmann. 2003. Identifying future competitive business strategies for the U.S. furniture industry: Benchmarking and paradigm shifts. Gen. Tech. Rept. NE-304. USDA Forest Serv., Northeastern Res. Sta., Newtown Square, PA. 15 pp.

_____, 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.

U.S. Department of Commerce. 2002. Trade database (FT900). U.S. Dept. of Commerce, Census Bureau, Federal Trade Div., Washington, DC.

Woodside, A.G., R.L. Nielsen, F. Walters, and G.D. Muller. 1988. Preference segmentation of health care services: The old-fashioneds, value conscious, affluents, and professional want-it-alls. J. of Health Care Marketing 8(2): 14-24.