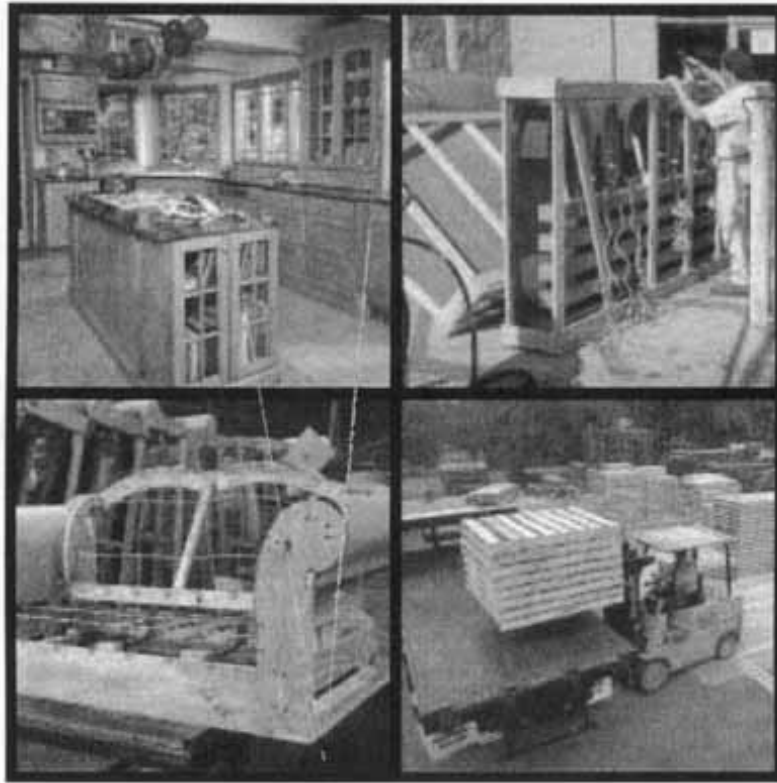


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Wood Use in Industrial Markets in the United States — 2000

by

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Abstract

The main objective of this study was to gather information on the volume of wood products used by industrial manufacturers across the United States (U.S.). Specific objectives included the following:

1. To identify and categorize the main industrial manufacturing industries in the U.S. that are likely to use wood products (using the North American Industrial Classification System - NAICS);
2. To quantify the type and volume of wood products used by these manufacturers;
3. To see whether that volume has increased, decreased or stayed the same from the past few years and if it is expected to increase, decrease or remain the same in the near future;
4. To document wood/non-wood substitutions;
5. To identify specific industrial manufacturing categories for follow-up market research (i.e., identify industries where either wood product's market share is at risk or represents opportunities for growth).

Through a phone survey of nearly 2,500 respondents spanning 20 identified NAICS industries where it was felt that wood use could be significant (and a lump sum of an equal number of identified "low wood use" NAICS industries), these objectives were met. *Note, however, that these identified NAICS industries will not represent 100% of potential wood product usage; while this is a limitation of this study, surveying in more depth would have been at a prohibitive cost.*

Total wood-use estimates from this study of industrial applications in the U.S. are shown in the following table: respondent usage rates of wood products per \$1,000 of sales were expanded to make an estimate of total U.S. sales.

Total wood-use quantities spanning 20 industrial NAICS industries

Industry shipments (U.S. \$1,000)	Lumber (1,000 board feet)		
	Softwood	Hardwood	Total
1997 \$120,710,060	10,951,162	11,883,111	22,834,273
1998 \$131,386,891	11,648,542	12,531,763	24,180,304
1999 \$141,532,444	12,392,539	13,328,513	25,721,052
2000 \$144,629,166	12,680,536	13,726,489	26,407,025

	Structural panels (1,000 ft ² , 3/8" basis)			Nonstructural panels (1,000 ft ² , 3/8" basis)				
	Softwood plywood	OSB	Total	Hardwood plywood	Particle- board	MDF	Hardboard	Total
1997	2,541,510	822,596	3,364,106	1,956,910	4,537,248	3,777,195	274,032	10,545,386
1998	2,725,733	889,956	3,615,689	2,137,951	4,903,133	4,094,063	297,695	11,432,841
1999	2,991,035	962,235	3,953,270	2,322,683	5,192,930	4,398,365	322,302	12,236,280
2000	3,170,525	978,279	4,148,804	2,343,469	5,502,181	4,626,348	329,664	12,801,662

In addition to wood-use statistics, valuable information was collected on usage trends, substitution trends, species breakdowns, and the quantification in the growth of prefabricated component inputs in manufacture.

In spite of the noted limitations of this study, this report details the most comprehensive estimate of softwood and hardwood lumber and non-structural wood-based panel usage in industrial applications since a USDA Forest Service study done for 1977 (McKeever and Martens, 1983). Combined with a more detailed analysis done by APA - *The Engineered Wood Association* for structural wood-based panels for 1998 (APA, 1999), the wood products industry now has fairly reliable and up-to-date information of wood usage in this significant end-use market in the US..

As a recommendation for further research, it will be important to more deeply investigate individual industrial manufacturers where wood has a large market share but is at threat of decline, and/or industries where wood does not have the market share that it could. Follow-up studies in either case should be of a market research nature, with an attempt to quantify and qualify specific attributes that these industrial manufacturers are looking for in their input materials, and where wood products are most likely to offer a competitive solution.

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1 Objective

The main objective of this study was to gather information on the volume of wood products used by industrial manufacturers across the United States (U.S.). Specific objectives included the following:

1. To identify and categorize the main industrial manufacturing industries in the U.S. that are likely to use wood products (using the North American Industrial Classification System);
2. To quantify the type and volume of wood products used by these manufacturers;
3. To see whether that volume has increased, decreased or stayed the same from the past few years and if it is expected to increase, decrease or remain the same in the near future;
4. To document wood/non-wood and non-wood/wood substitutions;
5. To identify specific industrial manufacturing categories for follow-up market research (i.e., identify industries where either wood product's market share is at risk or represent opportunities for growth).

2 Introduction

The Wood Products Council (WPC) is a group of associations that pool their resources to promote wood products and increase industry knowledge about end use markets. Forintek Canada Corporation was selected by the WPC to conduct a study of wood products used in industrial markets. Those funding the study were: APA -- *The Engineered Wood Association*, Canadian Wood Council, Forintek Canada Corporation, Southern Forest Products Association, the US Forest Service Forestry Sciences Laboratory, Princeton WV and the Western Wood Products Association.

This report provides an estimate of wood products used by selected industrial manufacturers in 2000. The last time when a study of such magnitude was conducted was in 1977, by David McKeever and David Martens at the USDA Forest Products Laboratory in Madison, Wisconsin.

Twenty industrial manufacturing categories were identified (based on the North American Industrial Classification System) for their potential for significant wood product usage, either as a component of what they manufacture, use in the manufacturing process, or for packaging (Table 2.1). Descriptions of these 20 industry categories are offered in Appendix One, including attention to industry concentration. It was found that most of these industries are highly concentrated, with most of the output coming from the large players. A further 18 categories were identified for their potential to use moderate quantities of wood products, and studied in aggregate. As the numbers of respondents in this category were so few, the results were considered insignificant and not reported in this report.

The wood product usage of interest in this study included softwood and hardwood lumber, softwood and hardwood plywood, oriented strand board (OSB), and nonstructural wood panels.

In addition to quantifying wood product usage in U.S. industrial manufacture, this study quantified/qualified changes over the past few years and expected over the coming few years and demanded characteristics of the wood products (use of pre-fabricated components versus commodity lumber/panels, species, size and quality information, and wood/non-wood substitution patterns).

Table 2.1. Selected U.S. industrial markets, identified for their potential for wood use (U.S. Bureau of the Census, 1997, 2000).

NAICS	Industry Type	1997 value of shipments (\$U.S. Billion)	2000 value of shipments (\$U.S. Billion)	Percentage of shipments by employee size class, 1997		Percentage of establishments by employee size class, 1997	
				≤ 99 employees	> 100 employees	≤ 99 employees	≥ 100 employees
321911	Wood Window and Door Mfg.	8.7	11.2	29.1%	70.9%	90.7%	9.3%
321918	Other Millwork (including flooring)	4.5	5.1	45.4%	54.6%	93.9%	6.1%
321920	Wood Container and Pallet Mfg.	4.5	5.1	85.5%	14.5%	98.3%	1.7%
321992	Prefabricated Wood Building Mfg.	3.0	3.6	49.2%	50.8%	91.3%	8.7%
321999	All Other Miscellaneous Wood Products Mfg.	3.9	4.5	63.1%	36.9%	97.6%	2.4%
336211	Motor Vehicle Body Mfg.	9.0	10.7	23.3%	76.7%	87.6%	12.4%
336212	Truck Trailer Mfg.	5.5	6.4	15.7%	84.3%	80.4%	19.6%
336213	Motor Home Mfg.	3.9	4.2	3.4%	96.6%	59.3%	40.7%
336214	Travel Trailer & Camper Mfg.	4.6	6.3	33.0%	67.0%	89.3%	10.7%
336510	Railroad Rolling Stock Mfg.	8.3	10.1	9.3%	90.7%	69.1%	30.9%
336611	Ship Building & Repairing	10.5	11.4	9.7%	90.3%	84.8%	15.2%
336612	Boat Building	5.6	8.3	24.5%	75.5%	90.4%	9.6%
337110	Wood Kitchen Cabinet & Countertop Mfg.	9.0	11.7	51.1%	48.9%	98.4%	1.6%
337121	Upholstered Household Furniture Mfg.	8.2	9.8	19.2%	80.8%	87.4%	12.6%
337122	Non-upholstered Wood Household Furniture Mfg.	11.3	13.9	23.3%	76.7%	93.3%	6.7%
337127	Institutional Furniture Mfg.	4.6	5.1	39.0%	61.0%	91.4%	8.6%
337211	Wood Office Furniture Mfg.	3.0	4.3	30.3%	69.7%	89.3%	10.7%
337212	Custom Architectural Woodwork & Millwork Mfg.	2.2	2.7	74.2%	25.8%	96.5%	3.5%
337215	Showcase, Partition, Shelving, and Locker Mfg.	8.0	8.7	44.8%	55.2%	92.3%	7.7%
337920	Blind & Shade Mfg.	2.4	2.7	24.6%	75.4%	89.7%	10.3%
Total		\$U.S. 120.7	\$U.S. 145.8				

3 Past studies on the volume of wood products used in industrial markets

3.1 Wood Use in Industrial Markets, 1977

The last time a comparable study on wood product usage was done for the industrial sector was in 1977. In this study the total volume of all wood products consumed was estimated at around 22.1 billion square feet (1" basis). As illustrated in Figure 3.1, solid lumber accounted for approximately 75% of the total volume (**roughly 16 billion board feet**), followed by particleboard and plywood at 10% (**roughly 6 billion board feet, 3/8 inch basis**) and 5% (**roughly 3 billion square feet, 3/8 inch basis**), respectively. Table 3.1 shows that the wood use in the U.S. was very much concentrated in a few manufacturing industries. Overall, six industries were found to be responsible for the majority (54%) of the total wood use within the industrial markets. These are millwork, wood pallets and skids, wood products not elsewhere classified, wood household furniture (except upholstered), mobile homes, and structural wood members not elsewhere classified (McKeever and Martens, 1983).

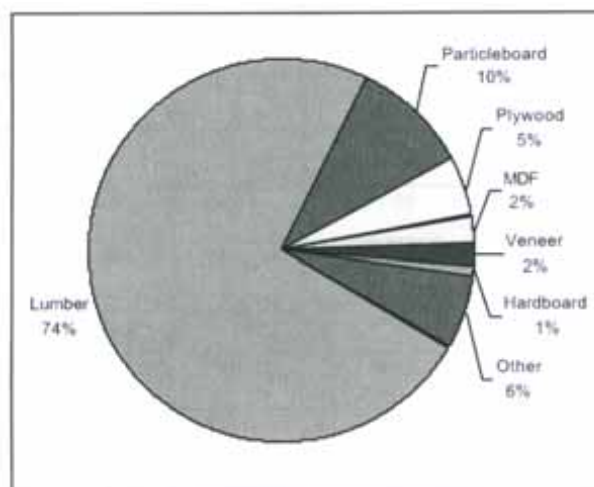


Figure 3.1. Wood used in U.S. manufacturing industries, 1977 (McKeever, 1983)

Table 3.1. Percent volume of all wood products used by high incidence manufacturing industries in 1977 (McKeever and Martens, 1983)

Industry Type	% Volume
millwork plants	13%
wood pallets and skids	12%
wood products not elsewhere classified	9%
wood household furniture	9%
mobile homes	6%
structural members not elsewhere classified	5%
all other industries	46%
Total	100%

This study sampled 59 of the 452 industries as described by the 1972 Standard Industrial Classification (SIC) manual. These industries were estimated to consume 90% of the total volume of wood used by all industrial manufacturers. The sample for the study included approximately 4,600 establishments from the 59 industries. Information was collected by mail survey.

As the 1997 study is the only other comprehensive industrial wood-use study in recent history, some detail is offered in the remainder of this section by wood product type.

3.1.1 Lumber

The total volume of lumber consumed by manufacturing industries in 1977 in the U.S. was estimated to be 16.4 billion board feet. 10.2 billion board feet of this volume was softwood lumber and 6.2 billion board feet was hardwood lumber. Table 3.2 shows the breakdown of consumption.

Table 3.2. Lumber use by manufacturing industry, 1977 (McKeever and Martens, 1983)

Industry Type	% Volume
wood pallets and skids	15%
millwork	15%
wood Products not elsewhere classified	10%
wood household furniture	9%
structural wood members not elsewhere classified	7%
prefabricated wood buildings	5%
mobile homes	5%
all other industries	34%
Total	100%

3.1.2 Particleboard

The total volume of particleboard consumed by manufacturing industries in the U.S. in 1977 was 2.9 billion square feet (3/4" basis). Table 3.3 shows the breakdown of use by industry.

Table 3.3. Particleboard use by manufacturing industry, 1977 (McKeever and Martens, 1983)

Industry Type	% Volume
radio and TV communication equipment	28%
mobile homes	9%
wood household furniture	8%
wood kitchen cabinets	8%
millwork plants	6%
wood partitions and fixture	5%
metal partitions and fixture	5%
all other industries	31%
Total	100%

3.1.3 Plywood

The total volume of plywood consumed by manufacturing industries in the U.S. was estimated to be 3.0 billion square feet (3/8" basis). 1.8 billion square feet (3/8" basis) or 60% of the total volume of plywood consumed was softwood. Table 3.4 shows the breakdown of use by industry.

Table 3.4. Plywood use by manufacturing industry, 1977 (McKeever and Martens, 1983)

Industry Type	% Volume
mobile homes	18%
millwork plants	8%
wood partitions and fixture	8%
wood kitchen cabinets	6%
boat building and repairing	5%
wood household furniture	5%
all other industries	50%
Total	100%

3.1.4 Veneer

The total volume of veneer consumed by the industrial manufacturers across the US. was estimated to be 1.1 billion square feet (3/8" basis). The majority of veneer consumed by the industrial manufacturers in the U.S. was hardwood (70%). Table 3.5 shows the breakdown of use by industry.

Table 3.5. Veneer use by manufacturing industry, 1977 (McKeever and Martens, 1983)

Industry Type	% Volume
Millwork	28%
wood household furniture	22%
household refrigerators and freezers	8%
wood containers not elsewhere classified	6%
all other industries	36%
Total	100%

3.1.5 Medium Density Fiberboard

The total volume of medium density fiberboard (MDF) consumed by manufacturing industries in the U.S. was estimated to be 0.51 billion square feet (3/4" basis). Table 3.6 shows the breakdown of use by industry.

Table 3.6. MDF use by manufacturing industry, 1977 (McKeever and Martens, 1983)

Industry Type	% Volume
wood household furniture	41%
wood partitions and fixture	7%
millwork plants	6%
wood kite hen cabinets	6%
metal partitions and fixture	6%
all other industries	34%
Total	100%

3.1.6 Hardboard

The total volume of hardboard consumed by manufacturing industries in the U.S. was estimated at 2.1 billion square feet (1/8" basis). Table 3.7 shows the breakdown of use by industry.

Table 3.7. Hardboard use by manufacturing industry, 1977 (McKeever and Martens, 1983)

Industry Type	% Volume
radio and TV communication equipment	17%
millwork	17%
household refrigerators and freezers	10%
wood household furniture	9%
wood partitions and fixtures	7%
mobile homes	6%
wood products not elsewhere classified	5%
all other industries	29%
Total	100%

3.2 Structural Panel Use in Industrial Markets, 1998

APA - The Engineered Wood Association undertook a study in 1998, focusing on structural wood usage in industrial manufacturing. Total estimated usage was 6.2 billion square feet, 94% of which was softwood plywood and 6% was OSB. They segmented this consumption under the following industries:

- furniture
- transportation (includes truck and bus bodies, motor vehicle parts, motor homes, aircraft, boats, etc.)
- wood products (includes millwork, wood kitchen cabinets and misc. wood products)
- manufactured materials handling (includes nailed wood boxes, wood pallets and skids, and wood containers)
- industries with a lower incidence of structural panel use (16 in total)

As shown in Figure 3.2, the furniture group consumed the highest volume of structural panels, at 1.873 billion square feet. This was followed by the transportation group with 1.650 billion square feet, then the wood products group with 1.027 billion square feet.

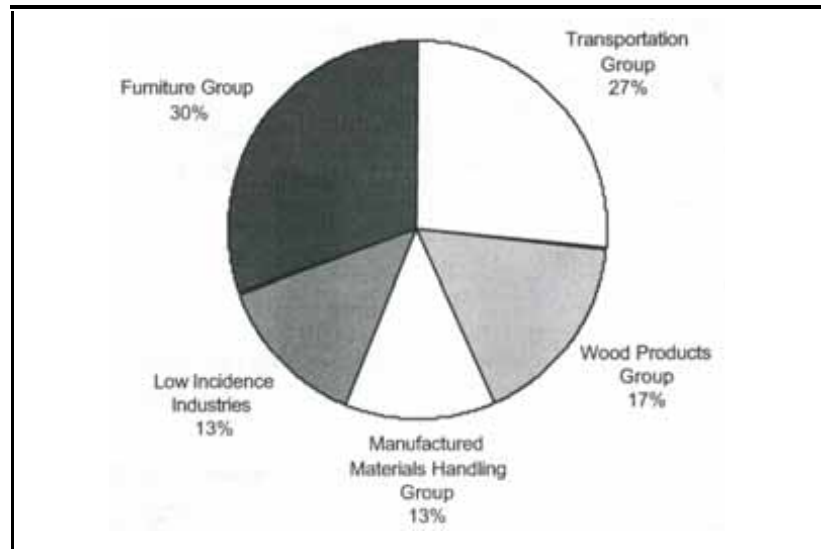


Figure 3.2. 1998 structural panel use by industry type (Adair, 1999)

APA - The Engineered Wood Association did a similar study in 1992. Figure 3.3 illustrates how consumption had changed over these two study years.

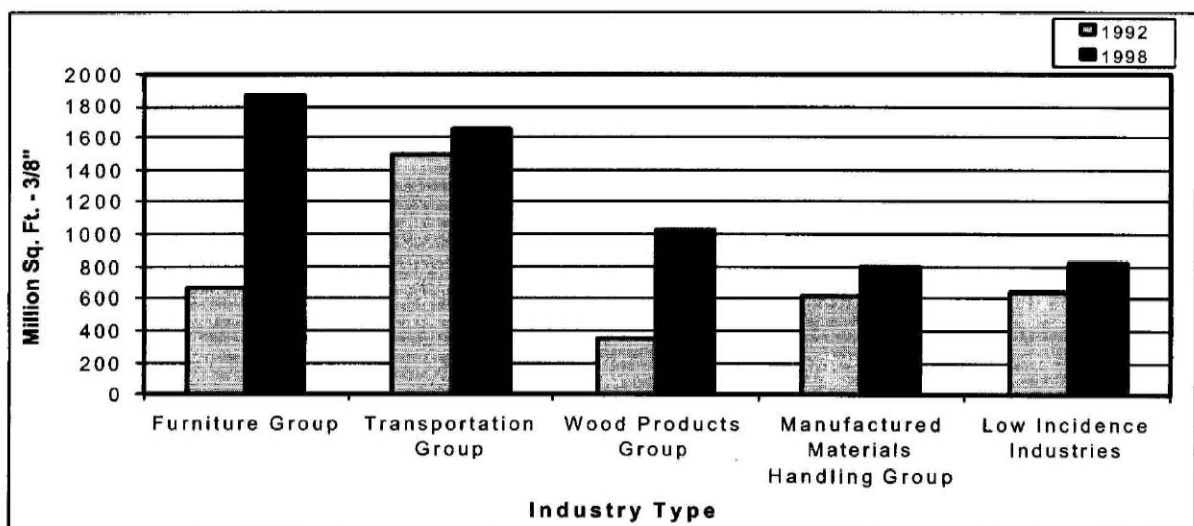


Figure 3.3. Volume of structural panels used by various U.S. industrial groups in 1992 and 1998 (Adair, 1999)

3.3 Wood Use Trends in the Pallet and Container industry: 1992-1999

There have been a number of studies reported in the literature on wood use within single industrial categories. An example of these which is fairly current, and represents a high wood usage, is Bejune, 2001 (Virginia Polytechnic Institute and State University), with a study on the U.S. Pallet and Container Industry. A mail survey implemented with manufacturers included Standard Industrial Classifications 2448, 2441 and 2449 for 1999 production.

Roughly 700 usable responses were generated, with the following breakdown of primary business: new pallets and skids, 61%; repaired/recycled pallets and skids, 25%; containers, 7%; pallet parts, 2%; pallet broker, 1 %; and “other,” 4%.

Frequency of new wood material usage over all respondents is shown in Figure 3.4.

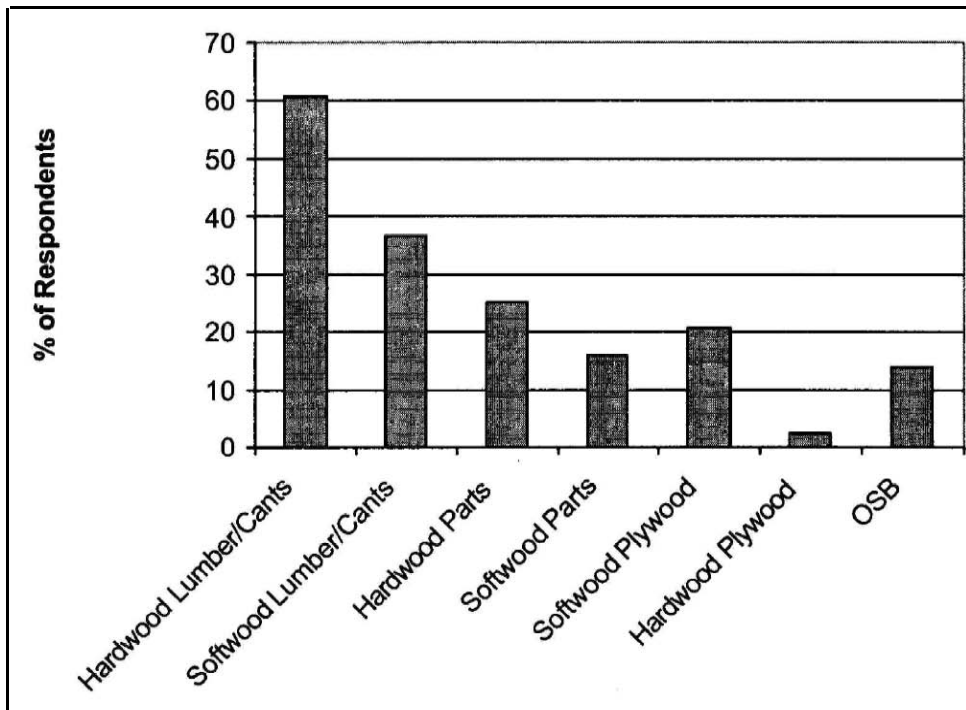


Figure 3.4. Frequency of U.S. wood use in the pallet and container industry, 1999 (Bejune, 2001)

While the author made no attempt to gross up the wood-use numbers to the population, the sample size was considerable, so the following numbers may be fairly representative of U.S. totals:

Hardwood lumber/cants	3.70 billion board feet
Hardwood parts	707 million board feet
Softwood lumber/cants	1.52 billion board feet
Softwood parts	610 million board feet
Softwood plywood	208 million square feet
Hardwood plywood	5 million square feet
OSB	77 million square feet

4 Research Methods

4.1 Survey Methodology

In 2001, Forintek Canada Corp. drafted a survey questionnaire, targeting the major industrial wood consuming industries across the US. The questionnaire was pre-tested by the representative of the Wood Product Council prior to its administration. A total of 20 industry groups were selected as high wood end-use industries. The goal of this study was to obtain 50 to 100 complete surveys for these high incidence industry groups, depending on the industry. For low-incidence industrial sectors, the objective was to find enough examples of wood product users to make a general prediction of industry consumption. The groups were defined according to the North American Industry Classification System (NAICS).

A list of 18,654 industrial manufacturers was purchased from a commercial list provider. A simple random sample was taken within those NAICS categories whose population was greater than 1,000 firms. In instances where population size was relatively small (approximately 1,000), a complete population list was purchased. The final list included 14,604 establishments with company size employing fewer than 100 individuals, 3,188 with more than 100 employees, and 862 within the miscellaneous categories (low-incidence industries). Extra effort was taken to ensure that at least 10% of completed responses included larger companies with more than 100 employees. This was crucial because although large companies make up only a small portion of the industrial population, they are responsible for the majority of shipments.

A telephone-interviewing firm in Seattle, Washington was selected to administer the questionnaire. All interviewers were trained in product knowledge for this study. The interviewers were instructed to continue with the calls until they reached the desired number of complete surveys. In addition, interviewers were told to only interview those companies whose primary business was in the stated NAICS code. By primary business, it was meant that at least 50% of a company's revenues be in the specified NAICS category. Although having this restriction made the data collection much more difficult, nonetheless, it was a necessary step to ensure that the sample chosen was representative of the general population. In the case of low-incidence industries, the upper limit for the number of calls was set at 862 randomly selected firms.

A further 18 NAICS codes were identified and grouped by their potential for some use of wood products. These "lesser-use" NAICS are listed in Table 4.1. The survey company was provided with a list of 50 random companies from each of these NAICS industries, for a total of 900. Their instructions were to contact all 900 and fill in a full survey if they used at least one wood product. Out of the 900 companies, roughly 600 of them were reached and identified to be in the appropriate NAICS category, yet only 37 companies were reported having used any wood products in 2000. As a result of this small number, results are not presented in this report for this group.

Table 4.1. List of "lesser-use" NAICS Codes

311 - Food Manufacturing
312 - Beverage and Tobacco Product Manufacturing
313 - Textile Mills
314 - Textile Product Mills
315 - Apparel Manufacturing
316 - Leather and Allied Product Manufacturing
323 - Printing and Related Support Activities
324 - Petroleum and Coal Products Manufacturing
325 - Chemical Manufacturing
326 - Plastics and Rubber Products Manufacturing
327 - Nonmetallic Mineral Product Manufacturing
331 - Primary Metal Manufacturing
332 - Fabricated Metal Product Manufacturing
333 - Machinery Manufacturing
334 - Computer and Electronic Product Manufacturing
335 - Electrical Equipment, Appliance, and Component Manufacturing
339 - Miscellaneous Manufacturing
337215 - Wood Television, Radio, and Sewing Machine Cabinet Manufacturing

4.2 Wood Use Volume Estimation Methodology

A ratio estimate in a stratified random sample procedure was used to estimate wood products use within each major wood using industry as listed in Table 2.1. NAICS Industry 337110, Wood kitchen cabinet & countertop manufacturing, is used here to illustrate the estimation procedure. A total of 123 individual establishments were surveyed in NAICS 33711. Data collected included total establishment sales (value of shipments) and employment, and the total amounts of lumber (softwood and hardwood), structural panels (softwood plywood and OSB), and nonstructural panels (particleboard, MDF, hardwood plywood, and hardboard) used. The sample was then stratified into two groups—those which reported that wood was used in one or more manufacturing applications, i.e., either in their final product, during the manufacturing process for jigs or patterns, for packaging or crating, or for other miscellaneous uses, and those which reported that no wood was used. Ninety-eight establishments reported that wood was used, 25 reported that no wood was used. Within the wood-using stratum, data were further stratified into those establishments with fewer than 20 employees, and those with 20 or more employees. This stratification helped to capture both the frequency and magnitude of wood products *use* differences between smaller and larger establishments. Sales, employment, and wood products consumption was then summed within each size class stratum. Statistics on the amounts of each wood product used per \$1,000 of sales, and per employee were calculated. Table 4.2 summarizes the data by employee size class and manufacturing application for softwood lumber for the 98 sampled establishments in NAICS 337110 which reported using wood.

Next, total sales (value of industry shipments) for NAICS 33711 for the years 1997 through 2000 were obtained from the U.S. Department of Commerce, Bureau of the Census. Data for 1997 were available by employee size class from the 1997 Census of Manufactures. Revised totals for 1997, and

data for 1998 through 2000 were available from the 2000 Annual Survey of Manufactures. Since data from the Annual Survey of Manufactures is not available by size class, size class distributions for 1997 from the 1997 Census of Manufactures were used to distribute sales by size class for subsequent years. Table 4.3 summarizes total sales by size class for surveyed establishments in NAICS 337110 that reported using wood, and surveyed establishments that reported no wood use stratified by employee size class. The proportion of sales by surveyed establishments that reported using wood was then applied to sales by all NAICS 337110 establishments stratified by employee size class to estimate industry-wide sales by all establishments that use wood, and by all establishments that do not use wood.

Next, industry-wide sales for establishments which use wood and had fewer than 20 employees were estimated for 1998, 1999 and 2000 by multiplying the proportion of sales by wood using establishments with fewer than 20 employees in the survey to total sales of all establishments. Similar calculations were made for establishments with 20 or more employees. These sales values were then multiplied by the average amounts of each wood product used per \$1,000 of sales by each application for establishments in the survey with fewer than 20 employees, and with 20 or more employees. The result was the estimated amount of each wood product used by size class and application. Amounts were then summed across both size class and all applications to yield estimated wood products consumption in NAICS 337110 for the years 1997, 1998, 1999 and 2000. Table 4.4 summarizes sales by wood-using establishments in NAICS 337110, and softwood lumber consumption estimates for 1997 through 2000.

Consumption estimates from Table 4.4 were then divided by total industry sales (sales by both wood using, and non-wood using establishments) to estimate industry-wide wood use factors, or the average amounts of each wood product used per \$1,000 of overall industry sales (Table 4.5). These wood use factors can be used to estimate consumption in future years if one is willing to assume that the basic relationships between wood products consumption and sales is fairly stable over the short run. They can also be used to compare relative levels of wood products consumption between different industries, or industry groups, and can also be used to estimate consumption by closely related industries.

This procedure was applied to each of the remaining 19 major wood using industries, and summed across all industries.

Table 4.2. Respondents reported softwood lumber usage in wood kitchen cabinet & countertop manufacturing- 2000

Employee size class	Sales (\$1,000)	Employ- ees (No.)	Establishments		SOFTWOOD LUMBER							
			with		Use	Applications						
			<20 employees	20+		Finished (%)	product (Bf)	Jigs & (%)	patterns (Bf)	Packing & (%)	crating (Bf)	Other (%)
Establishments with fewer than 20 employees:												
Total	44,196	436	58		1,459,722	--	1,448,227	--	1,500	--	0	-- 9,995
Average	762	8			25,168	--	24,969	--	26	--	0	-- 172
			Per \$1,000 of sales		33	--	33	--	0	--	0	-- 0
			Per employee		3,348	--	3,322	--	3	--	0	-- 23
			Average, wood using estbs only		47,088	99	46,717	0	48	0	0	1 322
Establishments with 20 or more employees:												
Total	1,181,943	10,508		40	371,488	--	219,651	--	69,404	--	69,404	-- 13,030
Average	29,549	263			9,287	--	5,491	--	1,735	--	1,735	-- 326
			Per \$1,000 of sales		0	--	0	--	0	--	0	-- 0
			Per employee		35	--	21	--	7	--	7	-- 1
			Average, wood using estbs only		19,552	59	11,561	19	3,653	19	3,653	4 686
Total, all establishments:												
Total	1,226,138	10,944	58	40	1,831,210	--	1,667,878	--	70,904	--	69,404	-- 0
Average	12,512	112			18,686	--	17,019	--	724	--	708	-- 0
			Per \$1,000 of sales		1	--	1	--	0	--	0	-- 0
			Per employee		167	--	152	--	6	--	6	-- 0
			Average, wood using estbs only		36,624	91	33,358	4	1,418	4	1,388	0 461

Table 4.3. Wood kitchen cabinet & countertop manufacturing - 1997 value of shipments

Category	Value of industry shipments (sales)					
	Establishments with fewer than 20 employees		Establishments with 20 or more employees		Total, all employees	
	(\$1,000)	%	(\$1,000)	(%)	(\$1,000)	(%)
Sample estimates						
Wood using establishments	44,196	80.84%	1,181,943	99.11%	1,226,138	98.31%
Non-wood using establishments	10,474	19.16%	10,648	0.89%	21,122	1.69%
Total	54,670	100.00%	1,192,590	100.00%	1,247,260	100.00%
Original 1997 estimates ^a						
Wood using establishments	2,024,371	80.84%	6,508,688	99.11%	8,533,059	94.06%
Non-wood using establishments	479,763	19.16%	58,634	0.89%	538,397	5.94%
Total	2,504,134	100.00%	6,567,322	100.00%	9,071,456	100.00%
1997 (2000 Survey of Manufactures) ^b						
Wood using establishments	2,015,082	80.84%	6,478,825	99.11%	8,493,907	94.06%
Non-wood using establishments	477,562	19.16%	58,365	0.89%	535,927	5.94%
Total	2,492,644	100.00%	6,537,190	100.00%	9,029,834	100.00%

^aSource: U.S. Department of Commerce, Bureau of the Census. 1999. 1997 Census of Manufactures.

<http://www.census.gov/prod/ec97/97m3371a.pdf>

^bSource: U.S. Department of Commerce, Bureau of the Census. 2002. 2000 Annual Survey of Manufactures.

<http://www.census.gov/prod/2002pubs/m00as-1.pdf>

Table 4.4. Final estimates of softwood lumber usage for wood kitchen cabinet & countertop manufacturing - 2000

Year/employee size class	Value of industry shipments by wood using establishments		SOFTWOOD LUMBER				
	(\$1,000)	%	Finished products (Bf)	Jigs & patterns (Bf)	Pack- aging, crating (Bf)	Other (Bf)	Total (Bf)
Survey use per \$1,000 of industry shipments							
Fewer than 20 employees	--	--	32.7686	0.0339	0.0000	0.2262	33.0287
20 or more employees	--	--	0.1858	0.0587	0.0587	0.0110	0.3143
Total	--	--	1.3603	0.0578	0.0566	0.0000	1.4747
Estimated total industry wood products use							
1997 ^a							
Fewer than 20 employees	2,015,082	24%	66,031,345	68,392	0	455,723	66,555,460
20 or more employees	6,478,825	76%	1,204,016	380,436	380,436	71,424	2,036,313
Total	8,493,907	100%	67,235,361	448,828	380,436	527,147	68,591,773
1998 ^a							
Fewer than 20 employees	2,188,155	--	71,702,686	74,266	0	494,864	72,271,817
20 or more employees	7,035,282	--	1,307,428	413,112	413,112	77,558	2,211,209
Total	9,223,437	--	73,010,114	487,378	413,112	572,423	74,483,026
1999 ^a							
Fewer than 20 employees	2,379,923	--	77,986,661	80,775	0	538,234	78,605,669
20 or more employees	7,651,850	--	1,422,010	449,316	449,316	84,355	2,404,998
Total	10,031,773	--	79,408,670	530,091	449,316	622,589	81,010,667
2000 ^a							
Fewer than 20 employees	2,610,996	--	85,558,591	88,617	0	590,492	86,237,701
20 or more employees	8,394,788	--	1,560,076	492,942	492,942	92,546	2,638,505
Total	11,005,784	--	87,118,668	581,559	492,942	683,038	88,876,206

^aValue of industry shipments by size class estimates based on size class percentages from the 1997 Census of Manufactures, and value of industry shipments from the 2000 Annual Survey of Manufactures.

Table 4.5. Total woodproducts consumption for wood kitchen cabinets & countertops, 1997-2000

		1997			1998	1999	2000
		Use per	Total use		Total use	Total use	Total use
		\$1,000 of shipments	Amount (1,000)	Percent	(1,000)	(1,000)	(1,000)
Industry shipments ^a	(\$)	--	\$9,029,834	--	\$9,805,394	\$10,664,732	\$11,700,199
Lumber							
Softwood	(Bf)	7.60	68,592	7%	74,483	81,011	88,876
Hardwood	(Bf)	96.27	869,301	93%	943,964	1,026,692	1,126,377
Total	(Bf)	103.87	937,893	100%	1,018,447	1,107,703	1,215,253
Structural panels							
Softwood plywood	(Ft ² , 3/8")	8.22	74,267	94%	80,646	87,713	96,230
OSB	(Ft ² , 3/8")	0.49	4,397	6%	4,775	5,193	5,698
Total	(Ft ² , 3/8")	8.71	78,664	100%	85,420	92,907	101,927
Nonstructural panels							
Hardwood plywood	(Ft ² , 3/8")	42.82	386,692	19%	419,905	456,705	501,047
Particleboard	(Ft ² , 3/8")	141.00	1,273,188	62%	1,382,541	1,503,705	1,649,704
MDF	(Ft ² , 3/8")	41.91	378,399	18%	410,899	446,910	490,302
Hardboard	(Ft ² , 3/8")	1.11	9,991	0%	10,849	11,800	12,946
Total	(Ft ² , 3/8")	226.83	2,048,271	100%	2,224,194	2,419,121	2,654,000

^aIndustry shipments from the 2000 Annual Survey of Manufactures.

5 Results

There were 1,338 completed phone surveys under the twenty primary identified North American Industrial Classification System (NAICS), 37 for the identified combined lesser-use industries, and 1,065 surveys that indicated that they “did not use any wood products” and were in the appropriate NAICS category, for a total of 2,440. Table 5.1 details the breakdown. Table 5.2 shows the number of wood-using respondents by NAICS industry code and product type.

Table 5.1 Breakdown of completed surveys by NAICS code

NAICS Code	Description	Under 20 employees	20 - 50 employees	50 - 100 employees	Over 100 employees	TOTAL
321911	Wood window & door	63	18	4	14	99
321918	Other millwork	70	17	10	3	100
321920	Wood container & pallet	61	23	6	10	100
331992	prefab wood building	47	13	6	4	70
321999	Misc. wood products	26	5	6	12	49
336211	Motor vehicle body	44	7	4	5	60
336212	Truck & trailer	39	7	1	15	62
336213	Motor home	12	4	2	2	20
336214	Travel trailer & camper	40	10	6	4	60
336510	Railroad rolling stock	7	2	0	3	12
336611	Ship building & repair	8	6	1	1	16
336612	Boat building	39	8	3	0	50
337110	Wood kitchen cabinets & countertop	57	13	10	17	97
337121	Upholstered household furniture	58	22	8	15	103
337122	Non-upholstered household furniture	62	22	5	14	103
337127	Institution furniture	50	21	6	23	100
337211	Wood office furniture	50	16	8	16	90
337212	Custom architectural woodwork & millwork	56	21	6	18	101
337215	Showcase, partition, shelving, locker	24	5	3	3	35
337920	Blinds & shades	8	2	0	1	11
	Sub-Total	821	242	95	180	1,338
	Lesser-use industries	22	3	0	12	37
	Non-wood users					1,065
	TOTAL					2,440

Table 5.2. Number of wood-using completed surveys by NAICS code and product type - 2000

NAICS	Industry Type	Softwood Lumber	Hardwood Lumber	Softwood Plywood	Hardwood Plywood	OSB	Particle- board	MDF	Hardboard
321911	Wood Window and Door Mfg.	61	75	7	22	11	17	29	12
321918	Other Millwork (including flooring)	31	85	19	27	3	13	19	8
321920	Wood Container and Pallet Mfg.	60	80	23	7	16	5	0	11
321992	Prefabricated Wood Building Mfg.	69	6	10	7	30	11	0	6
321999	All Other Miscellaneous Wood Products Mfg.	49	29	33	9	7	10	0	6
336211	Motor Vehicle Body Mfg.	24	38	5	6	2	0	0	0
336212	Truck Trailer Mfg.	39	25	8	6	2	0	0	0
336213	Motor Home Mfg.	2	2	28	6	1	0	0	1
336214	Travel Trailer & Camper Mfg.	42	13	45	5	4	7	0	2
336510	Railroad Rolling Stock Mfg.	3	9	29	2	1	0	0	1
336611	Ship Building & Repairing	11	10	27	2	0	0	0	0
336612	Boat Building	31	32	32	26	3	0	0	3
337110	Wood Kitchen Cabinet & Countertop Mfg.	97	91	22	82	8	57	56	33
337121	Upholstered Household Furniture Mfg.	103	91	38	38	7	0	0	3
337122	Non-upholstered Wood Household Furniture Mfg.	103	88	13	59	4	16	32	10
337127	Institutional Furniture Mfg.	26	64	1	43	8	25	24	14
337211	Wood Office Furniture Mfg.	24	70	0	44	13	66	48	32
337212	Custom Architectural Woodwork & Millwork Mfg.	101	33	0	28	3	57	36	12
337215	Showcase, Partition, Shelving, and Locker Mfg.	35	16	8	9	1	19	11	3
337920	Blind & Shade Mfg.	3	6	0	0	0	0	0	0
	Total	604	863	348	428	124	303	255	157

Section 5.1 and 5.2 present the results of the volume of wood product usage and qualification of this usage, respectively. This corresponds to the first two questions of the survey for wood-use, and the balance of the questions for its qualification. The full survey is included as Appendix Two.

5.1 Volume of Wood Use in U.S. Industrial Markets

The summary of wood product usage for the 20 identified industrial NAICS codes is offered in Table 5.3. Table 5.4 through Table 5.6 identify the top 10 industries for lumber, structural and nonstructural panel usage among the 20, respectively. Finally, Table 5.7 details wood product usage for each of the identified industrial NAICS codes.

Lumber

The most striking result of this study for lumber is the level of increase for 2000 from that reported for 1977 by McKeever and Martens, particularly for hardwoods. Total consumption for 2000 was estimated at nearly 13 billion board feet and 14 billion board feet for softwood and hardwood lumber, respectively, for the 20 identified industrial NAICS industries. This compares to 10.2 billion board feet and 6.2 billion board feet, respectively, for industrial usage as defined by McKeever and Martens.

Second, the top three industrial categories for lumber consumption are estimated to be Wood Products, “not elsewhere classified” (36% of total lumber consumption), Wood Container & Pallet Manufacturers (25%) and Other Millwork (including Flooring) (12%). Except for the order and total percentage, this is virtually identical to the 1977 results: Wood Pallets and Skids (15%), Millwork (15%) and Wood Products, “not elsewhere classified” (10%). Total percentage of lumber use for the top three in 2000 is 73% as compared to 40% in 1977!

Resource Information Systems, Inc. (RISI), which publishes wood-use estimates in their “North American Lumber Annual Historical Data” publication (Paperloop, 2002), reports industrial softwood lumber consumption for 2000 of 13.15 billion board feet, in line with the present study’s estimate. RISI does not publish hardwood lumber estimates.

Structural Panels

2000 estimates for structural panels are 4.2 billion square feet, 3/8" basis. 76% of this was softwood plywood, and the balance OSB. This compares to 1.8 billion square feet of softwood plywood, 3/8" basis, for 1977 as reported by McKeever and Martens (and zero OSB). The top three industrial categories for 2000 were Boat Building (26%), Prefabricated Wood Building Manufacturing (23%), and Showcase, Partition, etc., Manufacturing (16%). This compares to 1977 as follows: Wood Partitions and Fixtures (1 O%), Mobile Homes (10%), and Boat Building and Repair (7%).

It must be noted that the present study’s 2000 estimates are considerably lower than 1998 estimates made by the APA - The Engineered Wood Association (1999). Their estimate for total industrial manufacturer softwood plywood consumption was 6.2 billion square feet, 3/8" basis. Further, their estimate of industrial OSB consumption was only 364 million square feet, 3/8" basis.

³ It is important to note that these figures are not directly comparable. First, the 1977 industrial manufacturers were identified by the Standard Industrial Classification System, as opposed to today’s NAICS. Second, the 1977 industrial manufacturers included industries not surveyed in the present study.

RISI also estimates softwood plywood consumption for industrial end-uses at a level comparable to the APA (which is where they get much of their information for structural panel usage), with 2000 level at 6.27 billion square feet, 3/8" basis (Paperloop, 2002). RISI's estimate for industrial OSB consumption for 2000 was 2.19 billion square feet, 3/8" basis.

There are a number of possible explanations for the significant difference in these results. Perhaps the most obvious is that the present study had a respondent sample quota (limited by cost) for each of the identified 20 NAICS industries based on *wood usage of any type*, whereas the APA study had a sample quota based on structural panel usage alone. This led to a sample size for the present study for softwood plywood users, for example, of 348 over all 20 industries, and APA reported a sample size of 741 (more than twice the size). Given the small number of softwood plywood and OSB users in a large number of the 20 individual industries investigated in this study, variances will be quite large as compared to the APA study.

APA's current estimate for structural panel use in all industrial markets is 7.225 billion square ft. 3/8" basis for 2000 and 5.825 for 2001. The reason for the decline in 2001 is the severe drop in U.S. manufacturing activity that has affected key markets such as motor homes, recreational vehicles, furniture, and all types of packaging and materials handling. The table below shows APA's estimates by market segment.

Structural Panels Used in Industrial Markets

Billion sq. ft. 3/8"	<u>2000</u>	<u>2001</u>
Transportation	1.400	1.187
Materials Handling	1.770	1.501
Furniture & Fixtures	2.265	1.812
Other Industrial	1.790	1.325
Total U.S. Industrial Use	7.225	5.825

Nonstructural Panels

2000 estimates for nonstructural panels are 12.8 billion square feet, 3/8" basis; 2.3 billion square feet 3/8" basis of this was hardwood plywood, 5.5 particleboard, 4.6 MDF, and .329 hardboard. This compares to 1.2 billion square feet 3/8" basis for hardwood plywood in 1977 (McKeever and Martens), 2.9 for particleboard, .508 for MDF, and 2.1 for hardboard.

Principal end-use industries were again fairly comparable with 1977 and 2000 estimates for hardwood plywood, but did vary for other nonstructural panels. For hardwood plywood, the top three users in 2000 were estimated to be Showcase, Partition, etc., Manufacturers; Wood Kitchen Cabinet & Countertop Manufacturers; and Motor Home Manufacturers. In 1977 the top three in order were Mobile Homes; Millwork; and Wood Kitchen Cabinets. For particleboard as a second example, the top three users in 2000 were Wood Kitchen Cabinet & Countertop Manufacturers; Showcase, Partition, etc., Manufacturers; (with Wood Window & Door Manufacturers a very close 4th). In 1977, this was Radio & Television Communication Equipment (a vast change!); Mobile homes; Non-upholstered Furniture; (and Wood Kitchen Cabinets a close 4th).

While RISI does not publish estimates for hardwood plywood usage, their 2000 estimates for particleboard in industrial applications were 6.4 billion square feet 3/8" basis, 2.6 MDF, and .592 hardboard (Paperloop, 2002).

Table 5.3. Summary total of wood-use quantities, the 20 industrial NAICS codes combine - 2000

	Industry shipments (U.S. \$1,000)	Lumber (1,000 board feet)						
		Softwood	Hardwood	Total				
1997	\$120,710,060	10,951,162	11,883,111	22,834,273				
1998	\$131,386,891	11,648,542	12,531,763	24,180,304				
1999	\$141,532,444	12,392,539	13,328,513	25,721,052				
2000	\$144,629,166	12,680,536	13,726,489	26,407,025				

	Structural panels (1,000 ft ² , 3/8" basis)			Nonstructural panels (1,000 ft ² , 3/8" basis)				
	Softwood plywood	OSB	Total	Hardwood plywood	Particle- board	MDF	Hardboard	Total
1997	2,541,510	822,596	3,364,106	1,956,910	4,537,248	3,777,195	274,032	10,545,386
1998	2,725,733	889,956	3,615,689	2,137,951	4,903,133	4,094,063	297,695	11,432,841
1999	2,991,035	962,235	3,953,270	2,322,683	5,192,930	4,398,365	322,302	12,236,280
2000	3,170,525	978,279	4,148,804	2,343,469	5,502,181	4,626,348	329,664	12,801,662

Table 5.4. Top ten lumber users among the 20 industrial NAICS codes - 2000

NAICS	(1,000 board feet)	Softwood	Hardwood	Total	
321999 - All Other Misc. Wood Product Mfg.		6,243,183	3,228,253	9,471,436	35.9%
321920 - Wood Container & Pallet Mfg.		2,105,533	4,550,295	6,655,828	25.2%
321918 - Other Millwork (including flooring)		151,318	2,999,863	3,151,182	11.9%
321992 - Prefabricated Wood Building Mfg.		1,624,757	16,483	1,641,240	6.2%
337122 - Non-upholstered Wood Household Furniture Mfg.		1,048,740	386,422	1,435,161	5.4%
321911 - Wood Window & Door Mfg.		1,226,465	183,514	1,409,979	5.3%
337110 - Wood Kitchen Cabinet & Countertop Mfg.		88,876	1,126,377	1,215,253	4.6%
337215 - Showcase, Partition, Shelving, & Locker Mfg.		14,132	412,482	426,614	1.6%
337121 - Upholstered Household Furniture Mfg.		10,292	308,507	318,799	1.2%
337211 - Wood Office Furniture Mfg.		55,028	239,204	294,232	1.1%
All other					1.5%

Table 5.5. Top ten structural panel users among the 20 industrial NAICS codes - 2000

NAICS	(1,000 ft ² , 3/8" basis)	Softwood plywood	OSB	Total	
336612 - Boat Building		1,068,158	1,156	1,069,314	25.8%
321992 - Prefabricated Wood Building Mfg.		285,074	654,900	939,973	22.7%
337215 - Showcase, Partition, Shelving, & Locker Mfg.		663,221	131	663,352	16.0%
321920 - Wood Container & Pallet Mfg.		340,448	47,030	387,478	9.3%
337121 - Upholstered Household Furniture Mfg.		314,985	12,316	327,302	7.9%
321999 - All Other Misc. Wood Product Mfg.		24,538	128,393	152,931	3.7%
337110 - Wood Kitchen Cabinet & Countertop Mfg.		96,230	5,698	101,927	2.5%
321911 - Wood Window & Door Mfg.		26,685	67,110	93,796	2.3%
337122 - Non-upholstered Wood Household Furniture Mfg.		66,295	5,129	71,423	1.7%
337212 - Custom Architectural Woodwork & Millwork Mfg.		68,838	65	68,903	1.7%
All other					6.6%

Table 5.6. Top ten nonstructural panel users among the 20 industrial NAICS codes - 2000

NAICS	(1,000 ft ² , 3/8" basis)	Hardwood plywood	Particle- board	MDF	Hardboard	Total	
337110 - Wood Kitchen Cabinet & Countertop Mfg.		501,047	1,649,704	490,302	12,946	2,654,000	20.7%
321911 - Wood Window & Door Mfg.		66,515	526,089	1,918,103	74,417	2,585,124	20.2%
337122 - Non-upholstered Wood Household Furniture Mfg.		69,097	563,765	1,347,942	27,605	2,008,410	15.7%
337215 - Showcase, Partition, Shelving, & Locker Mfg.		513,035	1,076,856	183,300	118	1,773,309	13.9%
337211 - Wood Office Furniture Mfg.		390,036	384,564	144,967	17,352	936,919	7.3%
337212 - Custom Architectural Woodwork & Millwork Mfg.		12,643	453,816	52,657	9,869	528,985	4.1%
321992 - Prefabricated Wood Building Mfg.		0	302,620	113,817	108,144	524,582	4.1%
321999 - All Other Misc. Wood Product Mfg.		12,030	241,490	189,761	27,423	470,704	3.7%
336213 - Motor Home Mfg.		436,279	20,044	1,283	12,910	470,517	3.7%
337127 - Institutional Furniture Mfg.		36,619	72,002	131,103	28,916	268,640	2.1%
All other							4.5%

Table 5.7. Summary wood usage in industrial manufacturing by NAICS code

NAICS (U.S. \$1,000)	Industry shipments	Lumber (1,000 board feet)			Structural panels (1,000 ft ² , 3/8" basis)			Nonstructural panels (1,000 ft ² , 3/8" basis)					
		Softwood	Hardwood	Total	Softwood plywood	OSB	Total	Hardwood plywood	Particle-board	MDF	Hardboard	Total	
321911 -Wood Window & Door Mfg.													
1997	\$8,673,423	950,708	142,253	1,092,960	20,685	52,021	72,707	51,560	407,803	1,486,838	57,685	2,003,886	
1998	\$9,359,956	1,025,960	153,513	1,179,472	22,323	56,139	78,462	55,641	440,083	1,604,527	62,251	2,162,501	
1999	\$10,309,993	1,130,095	169,094	1,299,189	24,588	61,837	86,426	61,288	484,751	1,767,387	68,569	2,381,995	
2000	\$11,189,194	1,226,465	183,514	1,409,979	26,685	67,110	93,796	66,515	526,089	1,918,103	74,417	2,585,124	
321918 - Other Millwork (Including Flooring)													
1997	\$4,442,404	131,342	2,603,830	2,735,172	19,552	4,530	24,083	33,059	177,246	16,550	4,046	230,902	
1998	\$4,632,487	136,962	2,715,243	2,852,205	20,389	4,724	25,113	34,474	184,830	17,259	4,220	240,782	
1999	\$5,105,390	150,943	2,992,427	3,143,370	22,470	5,206	27,677	37,993	203,699	19,020	4,650	265,362	
2000	\$5,118,078	151,318	2,999,863	3,151,182	22,526	5,219	27,746	38,087	204,205	19,068	4,662	266,022	
321920 - Wood Container & Pallet Mfg.													
1997	\$4,489,070	1,868,024	4,037,011	5,905,035	302,044	41,725	343,770	3,625	2,157	10,643	4,333	20,757	
1998	\$4,684,805	1,949,474	4,213,035	6,162,509	315,214	43,545	358,759	3,783	2,251	11,107	4,522	21,663	
1999	\$4,868,008	2,025,710	4,377,789	6,403,499	327,541	45,247	372,788	3,931	2,339	11,542	4,698	22,510	
2000	\$5,059,831	2,105,533	4,550,295	6,655,828	340,448	47,030	387,478	4,086	2,431	11,997	4,883	23,397	
321992 - Prefabricated Wood Building Mfg.													
1997	\$3,028,520	1,373,006	13,929	1,386,934	240,902	553,425	794,327	0	255,730	96,182	91,387	443,299	
1998	\$3,296,201	1,494,361	15,160	1,509,521	262,195	602,340	864,535	0	278,333	104,683	99,465	482,481	
1999	\$3,569,713	1,618,360	16,418	1,634,778	283,951	652,321	936,273	0	301,429	113,369	107,718	522,516	
2000	\$3,583,823	1,624,757	16,483	1,641,240	285,074	654,900	939,973	0	302,620	113,817	108,144	524,582	
321999 - All Other Misc. Wood Product Mfg.													
1997	\$3,917,038	5,493,439	2,840,572	8,334,011	21,591	112,975	134,566	10,585	212,489	166,973	24,130	414,177	
1998	\$4,136,119	5,800,688	2,999,446	8,800,134	22,799	119,293	142,092	11,178	224,374	176,312	25,480	437,342	
1999	\$4,389,304	6,155,767	3,183,052	9,338,819	24,194	126,596	150,790	11,862	238,108	187,104	27,039	464,114	
2000	\$4,451,635	6,243,183	3,228,253	9,471,436	24,538	128,393	152,931	12,030	241,490	189,761	27,423	470,704	

NAICS (U.S. \$1,000)	Industry shipments	Lumber (1,000 board feet)			Structural panels (1,000 ft², 3/8" basis)			Nonstructural panels (1,000 ft², 3/8" basis)				
		Softwood	Hardwood	<i>Total</i>	Softwood plywood	OSB	<i>Total</i>	Hardwood plywood	Particle-board	MDF	Hardboard	<i>Total</i>
336211 - Motor Vehicle Body Mfg.												
1997	\$9,008,512	17,159	130,061	147,219	14,890	244	15,134	5,171	1,890	0	0	7,061
1998	\$9,695,984	18,468	139,986	158,454	16,027	262	16,289	5,565	2,034	0	0	7,599
1999	\$10,520,313	20,038	151,887	171,925	17,389	284	17,674	6,039	2,207	0	0	8,245
2000	\$10,650,985	20,287	153,774	174,061	17,605	288	17,893	6,114	2,234	0	0	8,348
336212 - Truck Trailer Mfg.												
1997	\$5,504,115	27,173	5,904	33,078	47,016	603	47,619	4,642	149	0	0	4,790
1998	\$6,380,428	31,500	6,844	38,344	54,501	699	55,200	5,381	172	0	0	5,553
1999	\$6,721,755	33,185	7,210	40,395	57,417	736	58,153	5,669	182	0	0	5,850
2000	\$6,379,582	31,496	6,843	38,339	54,494	699	55,193	5,380	172	0	0	5,552
336213 - Motor Home Mfg.												
1997	\$3,894,350	944	2,433	3,377	2,310	2,235	4,545	403,392	18,533	1,186	11,937	435,048
1998	\$4,465,757	1,082	2,791	3,873	2,649	2,563	5,211	462,580	21,253	1,360	13,689	498,882
1999	\$5,311,038	1,287	3,319	4,606	3,150	3,048	6,198	550,138	25,275	1,618	16,280	593,310
2000	\$4,211,844	1,021	2,632	3,652	2,498	2,417	4,915	436,279	20,044	1,283	12,910	470,517
336214 - Travel Trailer & Camper Mfg.												
1997	\$4,600,691	21,290	7,287	28,577	21,071	18,931	40,002	488	1,460	14,190	2	16,141
1998	\$5,247,098	24,281	8,311	32,593	24,031	21,591	45,622	557	1,666	16,184	2	18,409
1999	\$5,966,081	27,609	9,450	37,059	27,324	24,549	51,874	633	1,894	18,401	3	20,931
2000	\$6,273,256	29,030	9,937	38,967	28,731	25,813	54,544	666	1,991	19,349	3	22,009
336510 - Railroad Rolling Stock Mfg.												
1997	\$8,263,395	1,683	1,858	3,541	394	35	429	116	0	0	44	160
1998	\$9,256,810	1,885	2,081	3,966	441	40	481	130	0	0	50	180
1999	\$10,352,310	2,108	2,328	4,436	494	44	538	145	0	0	55	201
2000	\$10,063,176	2,049	2,263	4,312	480	43	523	141	0	0	54	195

NAICS	Industry shipments (U.S. \$1,000)	Lumber (1,000 board feet)			Structural panels (1,000 ft², 3/8" basis)			Nonstructural panels (1,000 ft², 3/8" basis)				
		Softwood	Hardwood	Total	Softwood plywood	OSB	Total	Hardwood plywood	Particle-board	MDF	Hardboard	Total
336611 - Ship Building & Repairing												
1997	\$10,542,961	3,699	559	4,258	363	0	363	31	21	0	0	52
1998	\$11,143,246	3,910	591	4,501	384	0	384	32	22	0	0	55
1999	\$11,070,960	3,884	587	4,472	381	0	381	32	22	0	0	54
2000	\$11,387,799	3,996	604	4,600	392	0	392	33	23	0	0	56
336612 - Boat Building												
1997	\$5,607,298	1,538	7,696	9,233	717,766	777	718,543	17,136	40	1,545	2	18,724
1998	\$5,938,598	1,628	8,150	9,779	760,175	823	760,997	18,149	42	1,636	2	19,830
1999	\$7,436,028	2,039	10,206	12,245	951,854	1,030	952,884	22,725	53	2,049	3	24,830
2000	\$8,344,610	2,288	11,453	13,741	1,068,158	1,156	1,069,314	25,502	60	2,299	3	27,864
337110 - Wood Kitchen Cabinet & Countertop Mfg.												
1997	\$9,029,834	68,592	869,301	937,893	74,267	4,397	78,664	386,692	1,273,188	378,399	9,991	2,048,271
1998	\$9,805,394	74,483	943,964	1,018,447	80,646	4,775	85,420	419,905	1,382,541	410,899	10,849	2,224,194
1999	\$10,664,732	81,011	1,026,692	1,107,703	87,713	5,193	92,907	456,705	1,503,705	446,910	11,800	2,419,121
2000	\$11,700,199	88,876	1,126,377	1,215,253	96,230	5,698	101,927	501,047	1,649,704	490,302	12,946	2,654,000
337121 - Upholstered Household Furniture Mfg.												
1997	\$8,232,635	8,650	259,297	267,947	264,742	10,352	275,094	190,085	95	317	301	190,798
1998	\$8,971,462	9,427	282,567	291,994	288,501	11,281	299,782	207,143	104	345	328	207,921
1999	\$9,601,031	10,088	302,396	312,484	308,746	12,072	320,819	221,680	111	370	351	222,512
2000	\$9,795,044	10,292	308,507	318,799	314,985	12,316	327,302	226,159	113	377	358	227,008
337122 - Non-upholstered Wood Household Furniture Mfg.												
1997	\$11,318,807	913,433	336,566	1,249,999	57,741	4,467	62,208	60,182	491,029	1,174,033	24,044	1,749,288
1998	\$12,372,652	998,479	367,902	1,366,381	63,117	4,883	68,000	65,785	536,747	1,283,342	26,282	1,912,157
1999	\$12,995,810	1,048,768	386,432	1,435,200	66,296	5,129	71,425	69,099	563,781	1,347,979	27,606	2,008,464
2000	\$12,995,458	1,048,740	386,422	1,435,161	66,295	5,129	71,423	69,097	563,765	1,347,942	27,605	2,008,410

NAICS (U.S. \$1,000)	Industry shipments	Lumber (1,000 board feet)			Structural panels (1,000 ft ² , 3/8" basis)			Nonstructural panels (1,000 ft ² , 318" basis)				
		Softwood	Hardwood	Total	Softwood plywood	OSB	Total	Hardwood plywood	Particle-board	MDF	Hardboard	Total
337127 - Institutional Furniture Mfg.												
1997	\$4,554,577	5,672	42,959	48,631	40,083	979	41,063	32,487	63,877	116,308	25,653	238,324
1998	\$5,051,833	6,292	47,649	53,941	44,460	1,086	45,546	36,034	70,851	129,006	28,453	264,343
1999	\$5,216,224	6,496	49,200	55,696	45,906	1,121	47,028	37,206	73,156	133,204	29,379	272,945
2000	\$5,133,944	6,394	48,424	54,818	45,182	1,104	46,286	36,619	72,002	131,103	28,916	268,640
337211 - Wood Office Furniture Mfg.												
1997	\$3,021,800	39,023	169,632	208,655	31,281	14,728	46,008	276,595	272,715	102,804	12,305	664,419
1998	\$3,226,753	41,670	181,137	222,807	33,402	15,727	49,129	295,355	291,212	109,776	13,140	709,483
1999	\$3,617,685	46,718	203,083	249,801	37,449	17,632	55,081	331,138	326,493	123,076	14,732	795,439
2000	\$4,261,141	55,028	239,204	294,232	44,110	20,768	64,878	390,036	384,564	144,967	17,352	936,919
337212 - Custom Architectural Woodwork & Millwork Mfg.												
1997	\$2,205,019	12,484	18,828	31,312	56,238	53	56,292	10,329	370,754	43,019	8,062	432,165
1998	\$2,419,287	13,697	20,658	34,355	61,703	58	61,762	11,333	406,781	47,200	8,846	474,159
1999	\$2,544,363	14,405	21,726	36,131	64,893	61	64,955	11,918	427,812	49,640	9,303	498,673
2000	\$2,699,024	15,280	23,047	38,327	68,838	65	68,903	12,643	453,816	52,657	9,869	528,985
337215 - Showcase, Partition, Shelving, & Locker Mfg.												
1997	\$7,949,346	12,967	378,473	391,440	608,540	120	608,660	470,736	988,071	168,187	109	1,627,103
1998	\$8,526,734	13,909	405,963	419,872	652,740	129	652,869	504,927	1,059,838	180,403	116	1,745,285
1999	\$8,350,351	13,621	397,565	411,186	639,237	126	639,363	494,482	1,037,914	176,671	114	1,709,182
2000	\$8,663,651	14,132	412,482	426,614	663,221	131	663,352	513,035	1,076,856	183,300	118	1,773,309
337920 - Blind & Shade Mfg.												
1997	\$2,426,265	338	14,661	14,999	32	0	32	0	0	20	0	20
1998	\$2,775,287	386	16,770	17,157	36	0	36	0	0	23	0	23
1999	\$2,921,355	407	17,653	18,060	38	0	38	0	0	25	0	25
2000	\$2,666,892	371	16,115	16,487	35	0	35	0	0	22	0	22

5.2 Qualification of Wood Use in U.S. Industrial Markets

Use of pre-cut components

- See Table 5.8 for details.
- An average of 30% of all wood-using respondents used pre-cut components (as opposed to lumber and panels for in-house manufacture) for greater than one-half of their material inputs in manufacture. The percentage of respondents was largest for Wood Office Furniture Manufacturing (84%), Truck Trailer Manufacturing (73%), and Railroad Rolling Stock Manufacturing (67%). Low incidence of component usage was found in Other Millwork (including flooring) (3%), Ship Building and Repair (6%), Non-upholstered Wood Household Furniture Manufacturing (10%), Motor Vehicle Body Manufacturing (10%), and Custom Architectural Woodwork (11%).

Change in wood usage in 2000 as compared to 1997

- See Table 5.9 through Table 5.22 for details. The changes reported are expected changes in volumes, not market shares, so they will to some degree reflect anticipated changes in the use of all input materials/manufacturing levels.
- **Softwood lumber:** Of all NAICS industries investigated, 23% of respondents felt that there was an increase in usage, by an average of 19%. 16% felt there was a decrease, by an average of 24%. 57% felt usage stayed the same and the remaining 4% did not know. The highest usage increases were reported for Wood Window and Door Manufacturers, Wood Container and Pallet Manufacturers, Truck Trailer Manufacturers, Wood Kitchen Cabinet and Countertop Manufacturers, and Non-upholstered Wood Household Furniture Manufacturers.
- **Hardwood lumber:** Of all NAICS industries investigated, 31% of respondents felt that there was an increase in usage, by an average of 19%. 18% felt there was a decrease, by an average of 21%. 50% felt usage stayed the same and the remaining 2% did not know. The highest usage increases were reported for “Other Millwork” (including flooring), Prefabricated Wood Building Manufacturers, and Wood Office Furniture Manufacturers.
- **Softwood plywood:** Of all NAICS industries investigated, 24% of respondents felt that there was an increase in usage, by an average of 15%. 20% felt there was a decrease, by an average of 22%. 55% felt usage stayed the same and the remaining 2% did not know. The highest usage increases were reported for Truck Trailer Manufacturers and Wood Office Furniture.
- **Hardwood plywood:** Of all NAICS industries investigated, 38% of respondents felt that there was an increase in usage, by an average of 18%. 13% felt there was a decrease, by an average of 18%. 48% felt usage stayed the same and the remaining 2% did not know. The highest usage increases were reported for “Other Millwork” (including flooring), Truck Trailer Manufacturing, Motor Home Manufacturers, Boat Building, and Wood Office Furniture Manufacturers.
- **OSB:** Of all NATCS industries investigated, 31% of respondents felt that there was an increase in usage, by an average of 23%. 15% felt there was a decrease, by an average of 23%. 54% felt usage stayed the same. The highest usage increases were reported for Wood Window and Door Manufacturers, Wood Container and Pallet Manufacturers, and Wood Office Furniture Manufacturers.
- **Particleboard:** Of all NAICS industries investigated, 36% of respondents felt that there was an increase in usage, by an average of 17%. 20% felt there was a decrease, by an average of 22%. 42% felt usage stayed the same and the remaining 3% did not know. The highest usage increases were reported for Wood Container and Pallet Manufacturers, Wood Office Furniture Manufacturers, and Custom Architectural Woodwork & Millwork Manufacturers.

- **MDF:** Of all NAICS industries investigated, 38% of respondents felt that there was an increase in usage, by an average of 18%. 14% felt there was a decrease, by an average of 20%. 48% felt usage stayed the same and the remaining 2% did not know. The highest usage increases were reported for Travel Trailer & Camper Manufacturers, Wood Office Furniture Manufacturers and Showcase, Partition, Shelving Manufacturers.
- **Hardboard:** Qualitative analysis was not done on hardboard because of low response rates for these questions.

Expected change in wood usage in 2003 as compared to 2000

- See Table 5.9 through Table 5.22 for details.
- **Softwood lumber:** Of all NAICS industries investigated, 29% of respondents felt that they expected an increase in usage, by an average of 17%. 12% expected a decrease, by an average of 19%. 49% expected usage to stay the same and the remaining 11% did not know. The highest expected usage increases were reported for Prefabricated Wood Building Manufacturers, Truck Trailer Manufacturers, Travel Trailer and Camper Manufacturers, Institutional Furniture Manufacturers and Wood office Furniture Manufacturers.
- **Hardwood Lumber:** Of all NAICS industries investigated, 35% of respondents felt that they expected an increase in usage, by an average of 18%. 8% expected a decrease, by an average of 26%. 48% expected usage to stay the same and the remaining 10% did not know. The highest expected usage increases were reported for “Other Millwork” (including flooring), Truck Trailer Manufacturers, Travel Trailer & Camper Manufacturers, and Wood Office Furniture Manufacturers.
- **Softwood Plywood:** Of all NAICS industries investigated, 29% of respondents felt that they expected an increase in usage, by an average of 15%. 7% expected a decrease, by an average of 24%. 58% expected usage to stay the same and the remaining 6% did not know. The highest expected usage increases were reported for Wood Container and Pallet Manufacturers, Prefabricated Wood Building Manufacturers, and Wood Office Furniture Manufacturers.
- **Hardwood Plywood:** Of all NAICS industries investigated; 35% of respondents felt that they expected an increase in usage, by an average of 17%. 8% expected a decrease, by an average of 25%. 49% expected usage to stay the same and the remaining 9% did not know. The highest expected usage increases were reported for Motor Vehicle Body Manufacturers, Truck Trailer Manufacturers, Motor Home Manufacturers, Travel Trailer & Camper Manufacturers, and Boat Building.
- **OSB:** Of all NAICS industries investigated, 33% of respondents felt that they expected an increase in usage, by an average of 14%. 8% expected a decrease, by an average of 30%. 49% expected usage to stay the same and the remaining 10% did not know. The highest expected usage increases were reported for Prefabricated Wood Building Manufacturers, Institutional Office Furniture Manufacturers and Wood Office Furniture Manufacturers.
- **Particleboard:** Of all NAICS industries investigated, 34% of respondents felt that they expected an increase in usage, by an average of 18%. 6% expected a decrease, by an average of 27%. 46% expected usage to stay the same and the remaining 14% did not know. The highest expected usage increases were reported for Prefabricated Wood Buildings.
- **MDF:** Of all NAICS industries investigated, 33% of respondents felt that they expected an increase in usage, by an average of 21%. 7% expected a decrease, by an average of 20%. 49% expected usage to stay the same and the remaining 11% did not know. The highest expected usage increases were reported for Prefabricated Wood Building Manufacturers, Travel Trailer & Camper Manufacturers and Wood Office Furniture Manufacturers.

Average Breakdown of Wood Use

See Table 5.23 through Table 5.26 for details

	Component*	Jig	Packaging	Other
Softwood Lumber	77%	4%	12%	7%
Hat-wood Lumber	88	1	2	9
Softwood Plywood	81	3	10	6
Hardwood Plywood	94	2	2	2
OSB	70	1	26	4
Particleboard	95	2	2	1
MDF	88	6	4	2

*As a component of the manufactured product.

Average Wood Product Usage Where Appearance Matters

See Table 5.27 for details.

Softwood Lumber	53%
Hardwood Lumber	73
Softwood Plywood	44
Hardwood Plywood	72
OSB	15
Particleboard	37
MDF	60

Wood/Non-wood Substitution

While the number of respondents that answered questions related to material substitution was small, the summary results are:

	Wood to Other	From Other to Wood
Softwood Lumber	MDF, plywood, plastic, HW lumber	Plywood, steel, HW lumber
Hardwood Lumber	MDF, plywood, plastic, SW lumber	Plywood, SW lumber
Softwood Plywood	OSB, lumber, particleboard, MDF	Lumber
Hardwood Plywood	MDF, lumber, particleboard	Lumber, MDF
OSB	n.a.	Plywood, lumber
Particleboard	MDF, plywood	MDF, plywood
MDF	Plywood, lumber	Plywood

Average Lumber Thickness

See Table 5.28 for details.

	< 1 inch	1-2 inches	>2 inches	Don't know
Softwood Lumber	42%	41%	10%	7%
Hardwood Lumber	52	32	11	5

Average Softwood Plywood Treatment Type

See Table 5.29 for details.

	Preservative	Fire	Not Treated	Other	Don't know
Softwood Plywood	10%	6%	72%	2%	10%

Average Softwood Lumber by Species

See Table 5.30 for details.

Canadian SPF	21%
Hemlock / Hem-fir	3
Douglas-fir	10
Yellow Cedar	1
Western red cedar	3
Sitka spruce	1
Southern yellow pine	25
Other*	19
Don't know	16

* “Other” was primarily identified as pine (in addition to the pine in SPF)

Average Hardwood Lumber by Species

See Table 5.31 for details.

Oak	40%
Cherry	6
Maple	11
Birch	2
Aspen, etc.	8
Beech	1
Other*	28
Don't know	4

Table 5.8. Proportion of respondents using pre-cut components for greater than 1/2 of their inputs in 2000

NAICS	Industry Type	"n"	Greater than 1/2 of input is precut (% of respondents)
321911	Wood Window and Door Mfg.	99	38%
321918	Other Millwork (including flooring)	100	3%
321920	Wood Container and Pallet Mfg.	100	25%
321992	Prefabricated Wood Building Mfg.	70	36%
321999	All Other Miscellaneous Wood Products Mfg.	49	18%
336211	Motor Vehicle Body Mfg.	60	10%
336212	Truck Trailer Mfg.	62	73%
336213	Motor Home Mfg.	20	20%
336214	Travel Trailer & Camper Mfg.	60	15%
336510	Railroad Rolling Stock Mfg.	12	67%
336611	Ship Building & Repairing	16	6%
336612	Boat Building	50	30%
337110	Wood Kitchen Cabinet & Countertop Mfg.	97	13%
337121	Upholstered Household Furniture Mfg.	103	16%
337122	Non-upholstered Wood Household Furniture Mfg.	103	10%
337127	Institutional Furniture Mfg.	100	23%
337211	Wood Office Furniture Mfg.	90	84%
337212	Custom Architectural Woodwork & Millwork Mfg.	101	11%
337215	Showcase, Partition, Shelving, and Locker Mfg.	35	20%
337920	Blind & Shade Mfg.	11	64%
	Lesser-use industries	37	49%
	Average		30%

Table 5.9 Softwood Lumber: Change from three years ago

NAICS	Industry Type	"n"	Increase	by average %	Decrease	by average %	stay the same	Don't know
321911	Wood Window and Door Mfg.	61	41.0%	11.0%	11.5%	23.6%	32.8%	14.8%
321918	Other Millwork (including flooring)	31	35.5%	24.1%	9.7%	25.0%	54.8%	0.0%
321920	Wood Container and Pallet Mfg.	60	48.3%	18.8%	23.3%	30.7%	28.3%	0.0%
321992	Prefabricated Wood Building Mfg.	69	33.3%	20.7%	18.8%	25.0%	40.6%	7.2%
321999	All Other Miscellaneous Wood Products Mfg.	29	17.2%	9.0%	44.8%	22.7%	31.0%	6.9%
336211	Motor Vehicle Body Mfg.	24	0.0%	n.a.	29.2%	20.7%	62.5%	8.3%
336212	Truck Trailer Mfg.	39	46.2%	48.7%	25.6%	22.0%	25.6%	2.6%
336213	Motor Home Mfg.	2						
336214	Travel Trailer & Camper Mfg.	42	45.2%	19.2%	21.4%	28.3%	31.0%	2.4%
336510	Railroad Rolling Stock Mfg.	3						
336611	Ship Building & Repairing	11	0.0%	n.a.	0.0%	n.a.	81.8%	18.2%
336612	Boat Building	31	22.6%	19.3%	19.4%	48.3%	54.8%	3.2%
337110	Wood Kitchen Cabinet & Countertop Mfg.	51	21.6%	17.7%	9.8%	19.0%	68.6%	0.0%
337121	Upholstered Household Furniture Mfg.	18	5.6%	15.0%	11.1%	25.0%	83.3%	0.0%
337122	Non-upholstered Wood Household Furniture Mfg.	49	24.5%	10.8%	10.2%	11.0%	61.2%	4.1%
337127	Institutional Furniture Mfg.	26	42.3%	29.5%	15.4%	17.5%	34.6%	7.7%
337211	Wood Office Furniture Mfg.	24	50.0%	14.6%	29.2%	19.3%	20.8%	0.0%
337212	Custom Architectural Woodwork & Millwork Mfg.	23	21.7%	23.0%	21.7%	33.0%	52.2%	4.3%
337215	Showcase, Partition, Shelving, and Locker Mfg.	8	0.0%	n.a.	25.0%	10.0%	75.0%	0.0%
337920	Blind & Shade Mfg.	3						
	Lesser-use industries	20	30.0%	10.0%	10.0%	20.0%	60.0%	0.0%
	Average		23.1%	19.4%	16.0%	23.6%	57.1%	3.8%

Table 5.10. Softwood Lumber: Expected change three years from now

NAICS	Industry Type	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	61	34.4%	10.6%	8.2%	17.9%	42.6%	14.8%
321918	Other Millwork (including flooring)	31	32.3%	13.0%	9.7%	18.3%	51.6%	6.5%
321920	Wood Container and Pallet Mfg.	60	31.7%	19.2%	11.7%	24.3%	45.0%	11.7%
321992	Prefabricated Wood Building Mfg.	69	49.3%	15.9%	4.3%	15.0%	36.2%	10.1%
321999	All Other Miscellaneous Wood Products Mfg.	29	31.0%	10.6%	13.8%	7.5%	31.0%	24.1%
336211	Motor Vehicle Body Mfg.	24	16.7%	15.0%	8.3%	10.0%	50.0%	25.0%
336212	Truck Trailer Mfg.	39	48.7%	16.1%	7.7%	5.0%	30.8%	12.8%
336213	Motor Home Mfg.	2						
336214	Travel Trailer & Camper Mfg.	42	50.0%	26.4%	7.1%	31.7%	40.5%	2.4%
336510	Railroad Rolling Stock Mfg.	3						
336611	Ship Building & Repairing	11	27.3%	41.7%	0.0%	n.a.	45.5%	27.3%
336612	Boat Building	31	25.8%	26.3%	16.1%	19.0%	54.8%	3.2%
337110	Wood Kitchen Cabinet & Countertop Mfg.	51	11.8%	18.3%	5.9%	18.3%	80.4%	2.0%
337121	Upholstered Household Furniture Mfg.	18	22.2%	20.0%	5.6%	15.0%	66.7%	5.6%
337122	Non-upholstered Wood Household Furniture Mfg.	49	12.2%	14.2%	8.2%	12.5%	69.4%	10.2%
337127	Institutional Furniture Mfg.	26	46.2%	10.0%	11.5%	11.7%	34.6%	7.7%
337211	Wood Office Furniture Mfg.	24	50.0%	14.2%	25.0%	15.8%	16.7%	8.3%
337212	Custom Architectural Woodwork & Millwork Mfg.	23	21.7%	13.0%	21.7%	21.0%	43.5%	13.0%
337215	Showcase, Partition, Shelving, and Locker Mfg.	8	0.0%	n.a.	0.0%	n.a.	50.0%	50.0%
337920	Blind & Shade Mfg.	3						
	Lesser-use industries	20	45.0%	9.4%	10.0%	10.0%	45.0%	0.0%
	Average		28.9%	17.2%	11.5%	18.5%	48.5%	11.2%

Table 5.11. *Hardwood Lumber: Change from three years ago*

NAICS	IndustryType	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	75	33.3%	15.2%	8.0%	21.7%	57.3%	1.3%
321918	Other Millwork (including flooring)	85	49.4%	18.6%	12.9%	29.5%	36.5%	1.2%
321920	Wood Container and Pallet Mfg.	80	32.5%	23.5%	26.3%	20.2%	41.3%	0.0%
321992	Prefabricated Wood Building Mfg.	6	50.0%	21.7%	16.7%	15.0%	33.3%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	29	27.6%	8.1%	27.6%	1.9%	37.9%	6.9%
336211	Motor Vehicle Body Mfg.	38	13.2%	19.0%	44.7%	27.9%	34.2%	7.9%
336212	Truck Trailer Mfg.	25	40.0%	14.0%	36.0%	28.3%	20.0%	4.0%
336213	Motor Home Mfg.	2						
336214	Travel Trailer & Camper Mfg.	13	38.5%	17.0%	30.8%	50.0%	15.4%	15.4%
336510	Railroad Rolling Stock Mfg.	9	22.2%	40.0%	11.1%	5.0%	66.7%	0.0%
336611	Ship Building & Repairing	10	10.0%	5.0%	0.0%	n.a.	90.0%	0.0%
336612	Boat Building	32	28.1%	17.2%	15.6%	25.0%	53.1%	3.1%
337110	Wood Kitchen Cabinet & Countertop Mfg.	91	31.9%	16.4%	9.9%	16.1%	57.1%	1.1%
337121	Upholstered Household Furniture Mfg.	91	27.5%	17.8%	26.4%	20.4%	42.9%	3.3%
337122	Non-upholstered Wood Household Furniture Mfg.	88	23.9%	22.1%	10.2%	28.3%	64.8%	1.1%
337127	Institutional Furniture Mfg.	64	29.7%	23.4%	18.8%	24.2%	51.6%	0.0%
337211	Wood Office Furniture Mfg.	70	52.9%	16.4%	25.7%	20.0%	20.0%	1.4%
337212	Custom Architectural Woodwork & Millwork Mfg.	33	21.2%	23.6%	24.2%	20.0%	54.5%	0.0%
337215	Showcase, Partition, Shelving, and Locker Mfg.	16	37.5%	13.3%	6.3%	15.0%	56.3%	0.0%
337920	Blind & Shade Mfg.	6	16.7%	35.0%	0.0%	n.a.	83.3%	0.0%
	Lesser-use industries	13	53.8%	16.4%	15.4%	10.0%	30.8%	0.0%
	Average		30.5%	19.2%	17.5%	27.0%	49.9%	2.2%

Table 5.12. Hardwood Lumber: Expected change three years from now

NAICS	Industry Type	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	75	37.3%	14.6%	1.3%	15.0%	58.7%	2.7%
321918	Other Millwork (including flooring)	85	50.6%	17.1%	14.1%	13.3%	24.7%	10.6%
321920	Wood Container and Pallet Mfg.	80	37.5%	17.3%	10.0%	17.5%	45.0%	7.5%
321992	Prefabricated Wood Building Mfg.	6	33.3%	20.0%	0.0%	n.a.	66.7%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	29	51.7%	18.3%	0.0%	n.a.	34.5%	13.8%
336211	Motor Vehicle Body Mfg.	38	26.3%	11.0%	10.5%	22.5%	23.7%	39.5%
336212	Truck Trailer Mfg.	25	64.0%	18.1%	4.0%	15.0%	28.0%	4.0%
336213	Motor Home Mfg.	2						
336214	Travel Trailer & Camper Mfg.	13	76.9%	23.0%	7.7%	75.0%	15.4%	0.0%
336510	Railroad Rolling Stock Mfg.	9	0.0%	n.a.	0.0%	n.a.	88.9%	11.1%
336611	Ship Building & Repairing	10	20.0%	45.0%	10.0%	15.0%	60.0%	10.0%
336612	Boat Building	32	34.4%	12.3%	9.4%	28.3%	53.1%	3.1%
337110	Wood Kitchen Cabinet & Countertop Mfg.	91	27.5%	19.8%	7.7%	15.0%	58.2%	6.6%
337121	Upholstered Household Furniture Mfg.	91	31.9%	13.6%	7.7%	33.6%	42.9%	17.6%
337122	Non-upholstered Wood Household Furniture Mfg.	88	18.2%	28.1%	3.4%	28.3%	62.5%	15.9%
337127	Institutional Furniture Mfg.	64	42.2%	16.1%	17.2%	18.6%	34.4%	6.3%
337211	Wood Office Furniture Mfg.	70	44.3%	11.5%	21.4%	15.0%	21.4%	12.9%
337212	Custom Architectural Woodwork & Millwork Mfg.	33	24.2%	10.0%	9.1%	15.0%	51.5%	15.2%
337215	Showcase, Partition, Shelving, and Locker Mfg.	16	31.3%	19.0%	6.3%	75.0%	50.0%	12.5%
337920	Blind & Shade Mfg.	6	33.3%	25.0%	0.0%	n.a.	66.7%	0.0%
	Lesser-use industries	13	46.2%	6.7%	7.7%	5.0%	30.8%	15.4%
	Average		34.8%	18.2%	7.0%	25.5%	48.4%	9.7%

Table 5.13. Softwood Plywood: Change from three years ago

NAICS	IndustryType	"n"	Increase		Decrease		Stay the same	Don't know
				average %		average %		
321911	Wood Window and Door Mfg.	13	15.4%	5.0%	0.0%	n.a.	84.6%	0.0%
321918	Other Millwork (including flooring)	9	33.3%	11.7%	22.2%	5.0%	44.4%	0.0%
321920	Wood Container and Pallet Mfg.	29	34.5%	16.0%	27.6%	25.0%	37.9%	0.0%
321992	Prefabricated Wood Building Mfg.	27	37.0%	16.0%	25.9%	23.6%	37.0%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	7	0.0%	n.a.	28.6%	75.0%	71.4%	0.0%
336211	Motor Vehicle Body Mfg.	19	15.8%	11.7%	31.6%	13.3%	52.6%	0.0%
336212	Truck Trailer Mfg.	23	43.5%	14.0%	21.7%	21.0%	26.1%	8.7%
336213	Motor Home Mfg.	10	0.0%	n.a.	30.0%	15.0%	70.0%	0.0%
336214	Travel Trailer & Camper Mfg.	33	36.4%	15.8%	21.2%	22.1%	39.4%	3.0%
336510	Railroad Rolling Stock Mfg.	5	0.0%	n.a.	20.0%	5.0%	80.0%	0.0%
336611	Ship Building & Repairing	8	50.0%	7.5%	0.0%	n.a.	50.0%	0.0%
336612	Boat Building	28	25.0%	17.9%	25.0%	26.4%	46.4%	3.6%
337110	Wood Kitchen Cabinet & Countertop Mfg.	45	15.6%	20.7%	4.4%	10.0%	80.0%	0.0%
337121	Upholstered Household Furniture Mfg.	29	31.0%	15.0%	6.9%	20.0%	62.1%	0.0%
337122	Non-upholstered Wood Household Furniture Mfg.	27	11.1%	25.0%	18.5%	27.0%	66.7%	3.7%
337127	Institutional Furniture Mfg.	32	28.1%	20.6%	28.1%	21.7%	40.6%	3.1%
337211	Wood Office Furniture Mfg.	22	40.9%	19.4%	27.3%	8.3%	31.8%	0.0%
337212	Custom Architectural Woodwork & Millwork Mfg.	38	26.3%	16.0%	10.5%	12.5%	60.5%	2.6%
337215	Showcase, Partition, Shelving, and Locker Mfg.	13	30.8%	12.5%	23.1%	28.3%	38.5%	7.7%
337920	Blind & Shade Mfg.	1						
	Lesser-use industries	8	37.5%	15.0%	37.5%	35.0%	25.0%	0.0%
	Average		24.4%	15.3%	19.5%	21.9%	54.5%	1.5%

Table 5.14. Softwood Plywood: Expected change three years from now

NAICS	IndustryType	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	13	15.4%	5.0%	0.0%	n.a.	84.6%	0.0%
321918	Other Millwork (including flooring)	9	44.4%	15.0%	22.2%	20.0%	33.3%	0.0%
321920	Wood Container and Pallet Mfg.	29	69.0%	18.0%	0.0%	n.a.	31.0%	0.0%
321992	Prefabricated Wood Building Mfg.	27	70.4%	18.2%	0.0%	n.a.	29.6%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	7	0.0%	n.a.	14.3%	15.0%	57.1%	28.6%
336211	Motor Vehicle Body Mfg.	19	36.8%	15.0%	0.0%	n.a.	52.6%	10.5%
336212	Truck Trailer Mfg.	23	30.4%	17.9%	13.0%	8.3%	52.2%	4.3%
336213	Motor Home Mfg.	10	0.0%	n.a.	10.0%	75.0%	90.0%	0.0%
336214	Travel Trailer & Camper Mfg.	33	36.4%	25.0%	6.1%	45.0%	57.6%	0.0%
336510	Railroad Rolling Stock Mfg.	5	20.0%	5.0%	0.0%	n.a.	80.0%	0.0%
336611	Ship Building & Repairing	8	12.5%	15.0%	0.0%	n.a.	75.0%	12.5%
336612	Boat Building	28	25.0%	22.1%	21.4%	21.7%	50.0%	3.6%
337110	Wood Kitchen Cabinet & Countertop Mfg.	45	15.6%	16.4%	4.4%	25.0%	80.0%	0.0%
337121	Upholstered Household Furniture Mfg.	29	44.8%	18.1%	3.4%	15.0%	48.3%	3.4%
337122	Non-upholstered Wood Household Furniture Mfg.	27	7.4%	10.0%	0.0%	n.a.	70.4%	22.2%
337127	Institutional Furniture Mfg.	32	28.1%	10.6%	21.9%	13.6%	43.8%	6.3%
337211	Wood Office Furniture Mfg.	22	50.0%	17.7%	18.2%	7.5%	22.7%	9.1%
337212	Custom Architectural Woodwork & Millwork Mfg.	38	26.3%	11.0%	10.5%	12.5%	55.3%	7.9%
337215	Showcase, Partition, Shelving, and Locker Mfg.	13	30.8%	7.5%	0.0%	n.a.	53.8%	15.4%
337920	Blind & Shade Mfg.	1						
	Lesser-use industries	8	50.0%	15.0%	0.0%	n.a.	50.0%	0.0%
	Average		29.2%	14.6%	6.9%	23.5%	58.0%	5.9%

Table 5.15. *Hardwood Plywood: Change from three years ago*

NAICS	IndustryType	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	22	9.1%	5.0%	13.6%	10.0%	77.3%	0.0%
321918	Other Millwork (including flooring)	27	48.1%	16.5%	11.1%	18.3%	40.7%	0.0%
321920	Wood Container and Pallet Mfg.	7	28.6%	25.0%	14.3%	15.0%	42.9%	14.3%
321992	Prefabricated Wood Building Mfg.	7	28.6%	25.0%	14.3%	15.0%	42.9%	14.3%
321999	All Other Miscellaneous Wood Products Mfg.	9	44.4%	15.0%	11.1%	15.0%	44.4%	0.0%
336211	Motor Vehicle Body Mfg.	6	33.3%	10.0%	16.7%	15.0%	50.0%	0.0%
336212	Truck Trailer Mfg.	6	66.7%	20.0%	16.7%	15.0%	16.7%	0.0%
336213	Motor Home Mfg.	6	66.7%	20.0%	16.7%	15.0%	16.7%	0.0%
336214	Travel Trailer & Camper Mfg.	5	40.0%	10.0%	0.0%	n.a.	60.0%	0.0%
336510	Railroad Rolling Stock Mfg.	2						
336611	Ship Building & Repairing	2						
336612	Boat Building	26	53.8%	25.0%	3.8%	15.0%	42.3%	0.0%
337110	Wood Kitchen Cabinet & Countertop Mfg.	82	29.3%	17.9%	7.3%	16.7%	62.2%	1.2%
337121	Upholstered Household Furniture Mfg.	38	23.7%	16.1%	21.1%	23.8%	55.3%	0.0%
337122	Non-upholstered Wood Household Furniture Mfg.	59	20.3%	22.5%	15.3%	43.9%	61.0%	3.4%
337127	Institutional Furniture Mfg.	43	44.2%	22.9%	14.0%	33.3%	41.9%	0.0%
337211	Wood Office Furniture Mfg.	44	47.7%	16.0%	31.8%	16.4%	20.5%	0.0%
337212	Custom Architectural Woodwork & Millwork Mfg.	28	21.4%	15.0%	25.0%	10.7%	53.6%	0.0%
337215	Showcase, Partition, Shelving, and Locker Mfg.	9	33.3%	18.3%	22.2%	10.0%	44.4%	0.0%
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	3						
	Average		37.8%	18.4%	12.7%	18.0%	47.8%	1.7%

Table 5.16. Hardwood Plywood: Expected change three years from now

NAICS	IndustryType	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	22	13.6%	8.3%	4.5%	15.0%	81.8%	0.0%
321918	Other Millwork (including flooring)	27	40.7%	18.6%	7.4%	45.0%	48.1%	3.7%
321920	Wood Container and Pallet Mfg.	7	28.6%	20.0%	28.6%	40.0%	28.6%	14.3%
321992	Prefabricated Wood Building Mfg.	7	28.6%	20.0%	28.6%	40.0%	28.6%	14.3%
321999	All Other Miscellaneous Wood Products Mfg.	9	44.4%	27.5%	11.1%	5.0%	33.3%	11.1%
338211	Motor Vehicle Body Mfg.	6	50.0%	8.3%	0.0%	n.a.	33.3%	16.7%
336212	Truck Trailer Mfg.	6	50.0%	21.7%	0.0%	n.a.	50.0%	0.0%
336213	Motor Home Mfg.	6	50.0%	21.7%	0.0%	n.a.	50.0%	0.0%
336214	Travel Trailer & Camper Mfg.	5	80.0%	16.3%	0.0%	n.a.	20.0%	0.0%
336510	Railroad Rolling Stock Mfg.	2						
336611	Ship Building & Repairing	2						
336612	Boat Building	26	46.2%	20.8%	7.7%	25.0%	46.2%	0.0%
337110	Wood Kitchen Cabinet & Countertop Mfg.	82	20.7%	19.1%	8.5%	16.4%	63.4%	7.3%
337121	Upholstered Household Furniture Mfg.	38	28.9%	15.0%	7.9%	41.7%	47.4%	15.8%
337122	Non-upholstered Wood Household Furniture Mfg.	59	22.0%	25.0%	8.5%	39.0%	59.3%	10.2%
337127	Institutional Furniture Mfg.	43	39.5%	12.6%	18.6%	15.0%	37.2%	4.7%
337211	Wood Office Furniture Mfg.	44	45.5%	12.0%	13.6%	6.7%	27.3%	13.6%
337212	Custom Architectural Woodwork & Millwork Mfg.	28	14.3%	5.0%	10.7%	11.7%	57.1%	17.9%
337215	Showcase, Partition, Shelving, and Locker Mfg.	9	22.2%	10.0%	0.0%	n.a.	33.3%	44.4%
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	3						
	Average		34.6%	16.5%	7.8%	25.0%	48.9%	8.7%

Table 5.17. OSB: Change from three years ago

NAICS	IndustryType	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	11	63.6%	1.4%	9.1%	30.0%	27.3%	0.0%
321918	Other Millwork (including flooring)	3	33.3%	15.0%	33.3%	5.0%	33.3%	0.0%
321920	Wood Container and Pallet Mfg.	16	56.3%	20.6%	12.5%	25.0%	31.3%	0.0%
321992	Prefabricated Wood Building Mfg.	30	43.3%	21.2%	26.7%	23.8%	30.0%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	7	14.3%	35.0%	42.9%	51.7%	42.9%	0.0%
336211	Motor Vehicle Body Mfg.	2						
336212	Truck Trailer Mfg.	2						
336213	Motor Home Mfg.	1						
336214	Travel Trailer & Camper Mfg.	4	50.0%	25.0%	25.0%	15.0%	25.0%	0.0%
336510	Railroad Rolling Stock Mfg.	1						
336611	Ship Building & Repairing	0						
336612	Boat Building	3						
337110	Wood Kitchen Cabinet & Countertop Mfg.	8	0.0%	n.a.	0.0%	n.a.	100.0%	0.0%
337121	Upholstered Household Furniture Mfg.	7	14.3%	15.0%	28.6%	7.5%	57.1%	0.0%
337122	Non-upholstered Wood Household Furniture Mfg.	4	25.0%	35.0%	25.0%	35.0%	50.0%	0.0%
337127	Institutional Furniture Mfg.	8	50.0%	17.5%	12.5%	15.0%	37.5%	0.0%
337211	Wood Office Furniture Mfg.	13	69.2%	15.0%	23.1%	18.3%	7.7%	0.0%
337212	Custom Architectural Woodwork & Millwork Mfg.	3						
337215	Showcase, Partition, Shelving, and Locker Mfg.	1						
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	2						
	Average		31.4%	22.6%	14.9%	22.6%	53.7%	0.0%

Table 5.18. OSB: Expected change three years from now

NAICS	Industry Type	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	11	36.4%	6.3%	0.0%	n.a.	54.5%	9.1%
321918	Other Millwork (including flooring)	3						
321920	Wood Container and Pallet Mfg.	16	37.5%	21.7%	12.5%	35.0%	43.8%	6.3%
321992	Prefabricated Wood Building Mfg.	30	56.7%	19.7%	3.3%	15.0%	40.0%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	7	14.3%	15.0%	14.3%	35.0%	57.1%	14.3%
336211	Motor Vehicle Body Mfg.	2						
336212	Truck Trailer Mfg.	2						
336213	Motor Home Mfg.	1						
336214	Travel Trailer & Camper Mfg.	4						
336510	Railroad Rolling Stock Mfg.	1						
336611	Ship Building & Repairing	0						
336612	Boat Building	3						
337110	Wood Kitchen Cabinet & Countertop Mfg.	8	0.0%	n.a.	12.5%	15.0%	75.0%	12.5%
337121	Upholstered Household Furniture Mfg.	7	14.3%	5.0%	0.0%	n.a.	71.4%	14.3%
337122	Non-upholstered Wood Household Furniture Mfg.	4						
337127	institutional Furniture Mfg.	8	50.0%	15.0%	12.5%	75.0%	37.5%	0.0%
337211	Wood Office Furniture Mfg.	13	53.8%	17.9%	7.7%	5.0%	15.4%	23.1%
337212	Custom Architectural Woodwork & Millwork Mfg.	3						
337215	Showcase, Partition, Shelving, and Locker Mfg.	1						
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	2						
	Average		32.9%	14.4%	7.9%	30.0%	49.3%	9.9%

Table 5.19. Particleboard: Change from three years ago

NAICS	IndustryType	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	17	41.2%	9.3%	17.6%	21.7%	41.2%	0.0%
321918	Other Millwork (including flooring)	13	38.5%	17.0%	0.0%	n.a.	61.5%	0.0%
321920	Wood Container and Pallet Mfg.	5	60.0%	28.3%	0.0%	n.a.	40.0%	0.0%
321992	Prefabricated Wood Building Mfg.	11	27.3%	21.7%	36.4%	30.0%	36.4%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	10	20.0%	15.0%	30.0%	21.7%	40.0%	10.0%
336211	Motor Vehicle Body Mfg.	0						
336212	Truck Trailer Mfg.	0						
336213	Motor Home Mfg.	0						
336214	Travel Trailer & Camper Mfg.	7	28.6%	15.0%	28.6%	25.0%	28.6%	14.3%
336510	Railroad Rolling Stock Mfg.	0						
336611	Ship Building & Repairing	0						
336612	Boat Building	0						
337110	Wood Kitchen Cabinet & Countertop Mfg.	57	28.1%	14.4%	14.0%	18.8%	54.4%	3.5%
337121	Upholstered Household Furniture Mfg.	0						
337122	Non-upholstered Wood Household Furniture Mfg.	16	25.0%	17.5%	31.3%	35.0%	43.8%	0.0%
337127	Institutional Furniture Mfg.	25	44.0%	18.6%	20.0%	27.0%	32.0%	4.0%
337211	Wood Office Furniture Mfg.	66	45.5%	16.3%	31.8%	16.9%	22.7%	0.0%
337212	Custom Architectural Woodwork & Millwork Mfg.	57	31.6%	18.9%	15.8%	10.6%	50.9%	1.8%
337215	Showcase, Partition, Shelving, and Locker Mfg.	19	36.8%	16.4%	10.5%	10.0%	52.6%	0.0%
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	0						
	Average		35.5%	17.4%	19.7%	21.7%	42.0%	2.8%

Table 5.20. Particleboard: Expected change three years from now

NAICS	Industry Type	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	17	41.2%	16.4%	0.0%	n.a.	58.8%	0.0%
321918	Other Millwork (including flooring)	13	38.5%	15.0%	7.7%	75.0%	53.8%	0.0%
321920	Wood Container and Pallet Mfg.	5	0.0%	n.a.	0.0%	n.a.	80.0%	20.0%
321992	Prefabricated Wood Building Mfg.	11	63.6%	15.0%	0.0%	n.a.	36.4%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	10	40.0%	15.0%	10.0%	35.0%	30.0%	20.0%
336211	Motor Vehicle Body Mfg.	0						
336212	Truck Trailer Mfg.	0						
336213	Motor Home Mfg.	0						
336214	Travel Trailer & Camper Mfg.	7	42.9%	21.7%	0.0%	n.a.	42.9%	14.3%
336510	Railroad Rolling Stock Mfg.	0						
336611	Ship Building & Repairing	0						
336612	Boat Building	0						
337110	Wood Kitchen Cabinet & Countertop Mfg.	57	22.8%	18.1%	12.3%	13.6%	56.1%	8.8%
337121	Upholstered Household Furniture Mfg.	0						
337122	Non-upholstered Wood Household Furniture Mfg.	16	25.0%	27.5%	6.3%	35.0%	37.5%	31.3%
337127	Institutional Furniture Mfg.	25	36.0%	18.3%	8.0%	25.0%	32.0%	24.0%
337211	Wood Office Furniture Mfg.	66	43.9%	12.2%	16.7%	7.7%	30.3%	9.1%
337212	Custom Architectural Woodwork & Millwork Mfg.	57	29.8%	11.5%	8.8%	11.0%	50.9%	10.5%
337215	Showcase, Partition, Shelving, and Locker Mfg.	19	26.3%	27.0%	5.3%	15.0%	42.1%	26.3%
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	0						
	Average		34.2%	18.0%	6.2%	27.2%	45.9%	13.7%

Table 5.21. MDF: Change from three years ago

NAICS	IndustryType	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	29	41.4%	12.5%	6.9%	15.0%	51.7%	0.0%
321918	Other Millwork (including flooring)	19	36.8%	25.0%	10.5%	10.0%	52.6%	0.0%
321920	Wood Container and Pallet Mfg.	6	33.3%	10.0%			66.7%	0.0%
321992	Prefabricated Wood Building Mfg.	9	22.2%	15.0%	44.4%	30.0%	33.3%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	11	45.5%	9.0%	9.1%	5.0%	36.4%	9.1%
336211	Motor Vehicle Body Mfg.	0						
336212	Truck Trailer Mfg.	0						
336213	Motor Home Mfg.	0						
336214	Travel Trailer & Camper Mfg.	8	50.0%	12.5%	1.5%	35.0%	37.5%	0.0%
336510	Railroad Rolling Stock Mfg.	0						
336611	Ship Building & Repairing	0						
336612	Boat Building	7	42.9%	38.3%			57.1%	0.0%
337110	Wood Kitchen Cabinet & Countertop Mfg.	56	21.4%	13.3%	7.1%	25.0%	69.6%	1.8%
337121	Upholstered Household Furniture Mfg.	0						
337122	Non-upholstered Wood Household Furniture Mfg.	32	21.9%	15.0%	12.5%	30.0%	62.5%	3.1%
337127	Institutional Furniture Mfg.	24	33.3%	23.8%	12.5%	18.3%	54.2%	0.0%
337211	Wood Office Furniture Mfg.	48	54.2%	18.1%	25.0%	13.3%	18.8%	2.1%
337212	Custom Architectural Woodwork & Millwork Mfg.	36	41.7%	15.0%	16.7%	16.7%	36.1%	5.6%
337215	Showcase, Partition, Shelving, and Locker Mfg.	11	54.5%	23.3%			45.5%	0.0%
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	0						
	Average		38.4%	17.8%	14.3%	19.8%	47.8%	1.7%

Table 5.22. MDF: Expected change three years from now

NAICS	Industry Type	"n"	Increase	by average %	Decrease	by average %	Stay the same	Don't know
321911	Wood Window and Door Mfg.	29	27.6%	13.8%	13.8%	27.5%	55.2%	3.4%
321918	Other Millwork (including flooring)	19	26.3%	17.0%	10.5%	45.0%	63.2%	0.0%
321920	Wood Container and Pallet Mfg.	6	16.7%	35.0%			50.0%	33.3%
321992	Prefabricated Wood Building Mfg.	9	55.6%	11.0%			44.4%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	11	27.3%	18.3%	9.1%	15.0%	45.5%	18.2%
336211	Motor Vehicle Body Mfg.	0						
336212	Truck Trailer Mfg.	0						
336213	Motor Home Mfg.	0						
336214	Travel Trailer & Camper Mfg.	8	62.5%	17.0%			37.5%	0.0%
336510	Railroad Rolling Stock Mfg.	0						
336611	Ship Building & Repairing	0						
336612	Boat Building	7	28.6%	55.0%			71.4%	0.0%
337110	Wood Kitchen Cabinet & Countertop Mfg.	56	16.1%	13.9%	7.1%	17.5%	71.4%	5.4%
337121	Upholstered Household Furniture Mfg.	0						
337122	Non-upholstered Wood Household Furniture Mfg.	32	21.9%	22.1%	9.4%	15.0%	53.1%	15.6%
337127	Institutional Furniture Mfg.	24	29.2%	7.9%	12.5%	18.3%	54.2%	4.2%
337211	Wood Office Furniture Mfg.	48	50.0%	12.1%	18.8%	10.6%	20.8%	10.4%
337212	Custom Architectural Woodwork & Millwork Mfg.	36	41.7%	12.3%	5.6%	10.0%	38.9%	13.9%
337215	Showcase, Partition, Shelving, and Locker Mfg.	11	27.3%	41.7%			36.4%	36.4%
337920	Blind & Shade Mfg.	0						
	Lesser-use industries	0						
	Average		33.1%	21.3%	7.2%	19.9%	49.4%	10.8%

Table 5.23. Breakdown of wood use: softwood and hardwood lumber - 2000

NAICS	Industry Type	Softwood Lumber					Hardwood Lumber				
		"n"	Component	Jig	Packaging	Other	"n"	Component	Jig	Packaging	Other
321911	Wood Window and Door Mfg.	61	97.2	0.7	2.1	0.0	75	97.8	1.7	0.4	0.0
321918	Other Millwork (including flooring)	31	86.5	8.1	3.3	2.1	85	97.6	1.0	0.0	1.4
321920	Wood Container and Pallet Mfg.	60	56.2	0.2	43.2	0.4	80	70.2	1.7	25.4	2.7
321992	Prefabricated Wood Building Mfg.	69	99.7	0.2	0.1	0.0	6	100.0	0.0	0.0	0.0
321999	All Other Miscellaneous Wood Products Mfg.	29	94.7	4.0	1.3	0.0	29	99.5	0.3	0.3	0.0
336211	Motor Vehicle Body Mfg.	24	95.0	0.8	4.2	0.0	38	94.7	0.0	2.6	2.6
336212	Truck Trailer Mfg.	39	94.2	0.0	3.2	2.6	25	100.0	0.0	0.0	0.0
336213	Motor Home Mfg.	2					2				
336214	Travel Trailer & Camper Mfg.	42	96.0	0.2	3.6	0.2	13	100.0	0.0	0.0	0.0
336510	Railroad Rolling Stock Mfg.	3					9	77.8	0.0	0.0	22.2
336611	Ship Building & Repairing	11	0.0	0.0	19.4	80.6	10	0.0	0.0	0.0	100.0
336612	Boat Building	31	57.3	21.8	2.3	18.5	32	75.8	6.3	0.8	17.1
337110	Wood Kitchen Cabinet & Countertop Mfg.	51	88.2	2.0	1.0	8.8	91	92.2	0.9	0.3	6.7
337121	Upholstered Household Furniture Mfg.	18	86.3	8.9	1.6	3.2	91	93.2	0.3	0.9	5.7
337122	Non-upholstered Wood Household Furniture Mfg.	49	82.8	9.7	6.4	1.0	88	89.1	3.9	0.2	6.8
337127	Institutional Furniture Mfg.	26	88.5	0.2	11.3	0.0	64	99.4	0.6	0.0	0.0
337211	Wood Office Furniture Mfg.	24	84.3	0.0	11.1	4.5	70	98.2	0.4	0.2	1.1
337212	Custom Architectural Woodwork & Millwork Mfg.	23	77.4	2.4	20.2	0.0	33	96.2	0.1	3.8	0.0
337215	Showcase, Partition, Shelving, and Locker Mfg.	8	81.9	6.3	11.9	0.0	16	90.0	0.0	10.0	0.0
337920	Blind & Shade Mfg.	3					6				
	Lesser-use industries	20	25.0	2.5	62.5	10.0	13	100.0	0.0	0.0	0.0
	<i>Average</i>		77.3	3.8	11.6	7.3		88.0	0.9	2.4	8.8

Table 5.24. Breakdown of wood use: softwood and hardwoodplywood - 2000

NAICS	Industry Type	Softwood Plywood					Hardwood Plywood				
		"n"	Component	Jig	Packaging	Other	"n"	Component	Jig	Packaging	Other
321911	Wood Window and Door Mfg.	13	92.3	0.0	7.7	0.0	22	98.0	2.0	0.0	0.0
321918	Other Millwork (including flooring)	9	99.4	0.6	0.0	0.0	27	86.6	2.7	0.0	10.7
321920	Wood Container and Pallet Mfg.	29	22.4	0.5	76.9	0.2	7	71.4	0.0	28.6	0.0
321992	Prefabricated Wood Building Mfg.	27	99.4	0.5	0.1	0.0	7				
321999	All Other Miscellaneous Wood Products Mfg.	7	83.6	16.4	0.0	0.0	9	88.3	11.7	0.0	0.0
336211	Motor Vehicle Body Mfg.	19	92.5	0.5	7.0	0.0	6	100.0	0.0	0.0	0.0
336212	Truck Trailer Mfg.	23	100.0	0.0	0.0	0.0	6	99.2	0.8	0.0	0.0
336213	Motor Home Mfg.	10	100.0	0.0	0.0	0.0	6	100.0	0.0	0.0	0.0
336214	Travel Trailer & Camper Mfg.	33	93.2	0.0	3.0	3.8	5	100.0	0.0	0.0	0.0
336510	Railroad Rolling Stock Mfg.	5	100.0	0.0	0.0	0.0	2				
336611	Ship Building & Repairing	8	3.6	0.0	2.9	93.6	2				
336612	Boat Building	28	68.7	21.1	5.6	4.6	26	84.6	2.9	1.0	11.5
337110	Wood Kitchen Cabinet & Countertop Mfg.	45	90.0	1.3	1.1	7.6	82	94.4	0.3	0.3	5.0
337121	Upholstered Household Furniture Mfg.	29	87.3	1.6	7.5	3.6	38	95.8	0.4	1.3	2.6
337122	Non-upholstered Wood Household Furniture Mfg.	27	75.4	9.8	3.7	11.1	59	91.2	3.7	1.7	3.3
337127	Institutional Furniture Mfg.	32	94.3	2.8	2.9	0.0	43	99.0	0.9	0.1	0.0
337211	Wood Office Furniture Mfg.	22	84.5	0.3	10.3	5.0	44	100.0	0.0	0.0	0.0
337212	Custom Architectural Woodwork & Millwork Mfg.	38	84.5	1.3	11.7	2.6	28	97.4	0.5	2.1	0.0
337215	Showcase, Partition, Shelving, and Locker Mfg.	13	91.4	0.0	8.6	0.0	9	100.0	0.0	0.0	0.0
337920	Blind & Shade Mfg.	1					0				
	Lesser-use industries	8	50.0	6.3	43.8	0.0	3				
	Average		80.6	3.1	9.6	6.6		94.1	1.6	2.2	2.1

Table 5.25. Breakdown of wood use: OSB and particleboard - 2000

NAICS	Industry Type	OSB				Particleboard					
		"n"	Component	Jig	Packaging	Other	"n"	Component	Jig	Packaging	Other
321911	Wood Window and Door Mfg.	11	81.4	9.1	9.5	0.0	17	94.1	5.9	0.0	0.0
321918	Other Millwork (including flooring)	3					13	90.7	7.4	1.9	0.0
321920	Wood Container and Pallet Mfg.	16	20.6	0.0	79.4	0.0	5				
321992	Prefabricated Wood Building Mfg.	30	100.0	0.0	0.0	0.0	11	100.0	0.0	0.0	0.0
321999	All Other Miscellaneous Wood Products Mfg.	7	57.1	0.0	42.9	0.0	10	77.0	1.5	21.5	0.0
336211	Motor Vehicle Body Mfg.	2									
336212	Truck Trailer Mfg.	2									
336213	Motor Home Mfg.	1									
336214	Travel Trailer & Camper Mfg.	4					7	100.0	0.0	0.0	0.0
336510	Railroad Rolling Stock Mfg.	1									
336611	Ship Building & Repairing	0									
336612	Boat Building	3									
337110	Wood Kitchen Cabinet & Countertop Mfg.	8	85.7	0.0	0.0	14.3	57	98.1	0.0	0.0	1.9
337121	Upholstered Household Furniture Mfg.	7	85.7	0.0	0.0	14.3					
337122	Non-upholstered Wood Household Furniture Mfg.	4					16	92.7	1.1	0.0	6.3
337127	Institutional Furniture Mfg.	8	100.0	0.0	0.0	0.0	25	99.6	0.4	0.0	0.0
337211	Wood Office Furniture Mfg.	13	27.0	0.0	73.0	0.0	66	96.7	0.3	1.7	1.3
337212	Custom Architectural Woodwork & Millwork Mfg.	3					57	94.8	0.9	2.6	1.8
337215	Showcase, Partition, Shelving, and Locker Mfg.	1					19	99.4	0.6	0.0	0.0
337920	Blind & Shade Mfg.	0									
	Lesser-use industries	2									
	Average		69.7	1.1	25.6	3.6		94.8	1.6	2.5	1.0

Table 5.26. Breakdown of wood use: medium-density fiberboard - 2000

NAICS	IndustryType	"n"	Comp.	Jig	Package	Other
321911	Wood Window and Door Mfg.	29	94.7	5.3	0.0	0.0
321918	Other Millwork (including flooring)	19	83.2	12.6	0.0	4.2
321920	Wood Container and Pallet Mfg.	6	33.3	16.7	50.0	0.0
321992	Prefabricated Wood Building Mfg.	9	100.0	0.0	0.0	0.0
321999	All Other Miscellaneous Wood Products Mfg.	11	99.1	0.9	0.0	0.0
336211	Motor Vehicle Body Mfg.	0				
336212	Truck Trailer Mfg.	0				
336213	Motor Home Mfg.	0				
336214	Travel Trailer & Camper Mfg.	8	100.0	0.0	0.0	0.0
336510	Railroad Rolling Stock Mfg.	0				
336611	Ship Building & Repairing	0				
336612	Boat Building	7	57.1	28.6	0.0	14.3
337110	Wood Kitchen Cabinet & Countertop Mfg.	56	90.2	0.4	0.0	9.4
337121	Upholstered Household Furniture Mfg.	0				
337122	Non-upholstered Wood Household Furniture Mfg.	32	92.8	4.0	0.1	3.1
337127	Institutional Furniture Mfg.	24	99.6	0.4	0.0	0.0
337211	Wood Office Furniture Mfg.	48	100.0	0.0	0.0	0.0
337212	Custom Architectural Woodwork & Millwork Mfg.	36	95.1	3.6	1.3	0.0
337215	Showcase, Partition, Shelving, and Locker Mfg.	11	99.8	0.2	0.0	0.0
337920	Blind & Shade Mfg.	0				
	Lesser-use industries	0				
	<i>Average</i>		88.1	5.6	4.0	2.4

Table 5.27. Percentage of woodproduct usage where appearance matters - 2000

NAICS	Industry Type	Softwood lumber	Hardwood lumber	Softwood plywood	Hardwood Plywood	OSB	Particleboard	MDF
321911	Wood Window and Door Mfg.	86.1	95.1	66.2	94.1	16.7	30.8	61.0
321918	Other Millwork (including flooring)	63.2	94.5	89.3	86.8		23.8	42.9
321920	Wood Container and Pallet Mfg.	37.1	40.6	19.2	70.7	11.8		33.3
321992	Prefabricated Wood Building Mfg.	77.2	100.0	29.4		15.6	25.0	100.0
321999	All Other Miscellaneous Wood Products Mfg.	65.9	84.3	62.1	66.1	18.6	35.5	74.5
336211	Motor Vehicle Body Mfg.	65.6	78.2	63.3	83.3			
336212	Truck Trailer Mfg.	71.0	84.6	78.5	28.3			
336213	Motor Home Mfg.			9.0	36.4			
336214	Travel Trailer & Camper Mfg.	62.4	77.3	68.0	100.0		42.9	55.0
336510	Railroad Rolling Stock Mfg.		38.9	50.0				28.6
336611	Ship Building & Repairing	11.4	27.3	0.0				
336612	Boat Building	31.5	83.8	32.1	80.4			
337110	Wood Kitchen Cabinet & Countertop Mfg.	55.8	90.0	60.9	84.8	14.3	36.9	45.0
337121	Upholstered Household Furniture Mfg.	19.8	24.0	18.8	27.1	14.3		
337122	Non-upholstered Wood Household Furniture Mfg.	67.8	88.4	49.4	83.5		24.9	74.7
337127	Institutional Furniture Mfg.	54.7	85.5	31.9	78.4	0.0	14.4	43.2
337211	Wood Office Furniture Mfg.	43.4	90.0	31.6	83.5	28.5	39.6	55.0
337212	Custom Architectural Woodwork & Millwork Mfg.	68.9	91.8	58.8	68.8		51.2	70.5
337215	Showcase, Partition, Shelving, and Locker Mfg.	38.1	80.5	47.3	85.6		77.3	95.7
337920	Blind & Shade Mfg.		90.0					
	Lesser-use industries	28.0	24.2	15.0				
	Average	52.7	73.4	44.0	72.4	15.0	36.6	60.0

Table 5.28. Thickness breakdown of lumber usage - 2000

NAICS	Industry Type	Softwood Lumber (inches)			Don't know	Hardwood Lumber (inches)			Don't know
		<1	1 - 2	2+		<1	1 - 2	2+	
321911	Wood Window and Door Mfg.	43.6%	36.7%	3.9%	15.8%	53.8%	30.4%	9.1%	6.7%
321918	Other Millwork (including flooring)	55.9%	30.1%	10.8%	3.2%	72.4%	27.6%	0.0%	0.0%
321920	Wood Container and Pallet Mfg.	49.5%	34.7%	9.3%	6.6%	50.6%	16.5%	25.3%	7.6%
321992	Prefabricated Wood Building Mfg.	0.0%	30.4%	69.6%	0.0%	100.0%	0.0%	0.0%	0.0%
321999	All Other Miscellaneous Wood Products Mfg.	51.2%	26.2%	15.5%	7.1%	56.3%	14.9%	11.5%	17.2%
336211	Motor Vehicle Body Mfg.	4.3%	47.8%	17.4%	30.4%	31.6%	44.7%	7.9%	15.8%
336212	Truck Trailer Mfg.	5.1%	92.3%	2.6%	0.0%	3.8%	80.8%	15.4%	0.0%
336213	Motor Home Mfg.								
336214	Travel Trailer & Camper Mfg.	16.3%	76.7%	2.3%	4.7%	46.2%	53.8%	0.0%	0.0%
336510	Railroad Rolling Stock Mfg.					33.3%	22.2%	44.4%	0.0%
336611	Ship Building & Repairing	0.0%	63.6%	9.1%	27.3%	18.2%	36.4%	27.3%	18.2%
336612	Boat Building	25.8%	58.1%	12.9%	3.2%	35.4%	47.9%	16.7%	0.0%
337110	Wood Kitchen Cabinet & Countertop Mfg.	90.4%	5.8%	0.0%	3.8%	92.3%	7.7%	0.0%	0.0%
337121	Upholstered Household Furniture Mfg.	47.4%	52.6%	0.0%	0.0%	52.5%	36.8%	3.1%	7.6%
337122	Non-upholstered Wood Household Furniture Mfg.	61.0%	25.0%	8.0%	6.0%	58.7%	32.6%	7.6%	1.1%
337127	Institutional Furniture Mfg.	40.4%	51.9%	3.8%	3.8%	49.7%	42.1%	8.2%	0.0%
337211	Wood Office Furniture Mfg.	45.3%	49.3%	5.3%	0.0%	36.9%	55.2%	8.0%	0.0%
337212	Custom Architectural Woodwork & Millwork Mfg.	89.1%	6.5%	4.3%	0.0%	93.9%	6.1%	0.0%	0.0%
337215	Showcase, Partition, Shelving, and Locker Mfg.	75.0%	25.0%	0.0%	0.0%	80.0%	10.0%	10.0%	0.0%
337920	Blind & Shade Mfg.					66.7%	33.3%	0.0%	0.0%
	Lesser-use industries	55.6%	27.8%	5.6%	11.1%	3.8%	53.8%	19.2%	23.1%
	Average	42.0%	41.2%	10.0%	6.8%	51.8%	32.6%	10.7%	4.9%

Table 5.29. Softwoodplywood usage by treatment type (if any) - 2000

NAICS	Industry Type	%				
		Preservative treated	Fire treated	Not treated	Other	Don't know
321911	Wood Window and Door Mfg.	0.0	0.0	84.6	0.0	15.4
321918	Other Millwork (including flooring)	1.1	15.0	83.9	0.0	0.0
321920	Wood Container and Pallet Mfg.	0.4	0.0	90.5	3.0	6.1
321992	Prefabricated Wood Building Mfg.	16.2	0.0	69.0	3.7	11.1
321999	All Other Miscellaneous Wood Products Mfg.	4.3	1.4	94.3	0.0	0.0
336211	Motor Vehicle Body Mfg.	20.0	0.0	64.0	6.0	10.0
336212	Truck Trailer Mfg.	29.2	6.3	56.3	0.0	8.3
336213	Motor Home Mfg.	0.0	0.0	100.0	0.0	0.0
336214	Travel Trailer & Camper Mfg.	31.3	5.8	48.4	2.4	12.1
336510	Railroad Rolling Stock Mfg.	40.0	0.0	40.0	0.0	20.0
336611	Ship Building & Repairing	18.1	44.4	0.0	0.0	37.5
336612	Boat Building	11.8	2.5	82.1	0.0	3.6
337110	Wood Kitchen Cabinet & Countertop Mfg.	0.0	0.4	99.6	0.0	0.0
337121	Upholstered Household Furniture Mfg.	2.8	6.2	65.2	5.2	20.7
337122	Non-upholstered Wood Household Furniture Mfg.	0.0	0.0	88.9	3.7	7.4
337127	Institutional Furniture Mfg.	6.1	2.9	76.7	0.0	14.3
337211	Wood Office Furniture Mfg.	0.0	13.6	72.7	0.0	13.6
337212	Custom Architectural Woodwork & Millwork Mfg.	7.7	4.5	85.3	0.0	2.6
337215	Showcase, Partition, Shelving, and Locker Mfg.	5.9	10.4	81.4	2.3	0.0
337920	Blind & Shade Mfg.					
	Lesser-use industries	0.0	5.6	56.9	12.5	25.0
	Average	9.7	5.9	72.0	1.9	10.4

Table 5.30. Softwood lumber usage by species breakdown - 2000

NAICS	Industry Type	Canadian SPF	Hemlock (Hem-fir)	Doug-fir	Yellow Cedar	WRC	Sitka Spruce	SYP	Other*	Don't Know
321911	Wood Window and Door Mfg.	10.0	5.3	6.9	0.3	0.7	0.5	13.7	49.6	12.9
321918	Other Millwork (including flooring)	21.8	2.7	2.0	6.5	9.0	0.0	14.7	42.6	0.6
321920	Wood Container and Pallet Mfg.	31.8	3.4	6.4	0.0	0.0	2.2	31.0	15.6	11.3
321992	Prefabricated Wood Building Mfg.	26.8	5.6	6.6	0.1	3.4	3.0	11.0	43.5	0.3
321999	All Other Miscellaneous Wood Products Mfg.	23.0	2.1	0.0	0.0	29.5	0.9	25.5	12.5	6.4
336211	Motor Vehicle Body Mfg.	2.1	1.3	18.8	0.0	0.0	4.2	44.6	20.8	8.3
336212	Truck Trailer Mfg.	21.8	0.0	17.9	0.0	0.0	0.0	44.4	5.6	10.3
336213	Motor Home Mfg.									
336214	Travel Trailer & Camper Mfg.	7.4	4.7	24.4	2.3	0.0	0.5	46.7	4.7	9.3
336510	Railroad Rolling Stock Mfg.									
336611	Ship Building & Repairing	25.7	0.0	37.4	0.0	0.0	0.0	17.7	10.1	9.1
336612	Boat Building	2.9	8.1	26.0	2.1	3.7	8.9	34.0	4.7	9.7
337110	Wood Kitchen Cabinet & Countertop Mfg.	32.1	0.0	1.9	0.2	0.0	0.0	1.9	47.6	15.7
337121	Upholstered Household Furniture Mfg.	30.0	1.1	1.1	1.1	0.5	0.0	8.4	26.3	31.6
337122	Non-upholstered Wood Household Furniture Mfg.	14.5	0.0	5.5	2.6	0.0	0.0	15.8	39.1	22.5
337127	Institutional Furniture Mfg.	19.2	0.0	15.0	7.7	0.0	0.0	15.4	7.7	35.0
337211	Wood Office Furniture Mfg.	4.0	12.0	7.0	0.0	0.0	4.0	17.0	8.0	48.0
337212	Custom Architectural Woodwork & Millwork Mfg.	49.6	6.1	5.2	0.0	0.0	0.0	16.5	0.0	22.6
337215	Showcase, Partition, Shelving, and Locker Mfg.	12.5	0.0	0.0	0.0	0.0	0.0	87.5	0.0	0.0
337920	Blind & Shade Mfg.	50.0	0.0	5.0	0.0	0.0	0.0	0.0	10.0	35.0
Lesser-use industries										
Average		21.4	2.9	10.4	1.3	2.6	1.3	24.8	19.4	16.0

* "Other" was primarily identified as pine (in addition to the pine in SPF)

Table 5.31. Hardwood lumber usage by species breakdown - 2000

		Oak	Cherry	Maple	Birch	Aspen etc.	Beech	Other*	Don't Know
NAICS	Industry Type								
321911	Wood Window and Door Mfg.	34.1	8.7	13.0	3.9	10.5	0.9	19.8	9.1
321918	Other Millwork (including flooring).	35.8	9.4	14.1	2.4	23.9	0.3	13.6	0.4
321920	Wood Container and Pallet Mfg.	42.0	3.5	4.4	2.7	13.9	1.8	29.3	2.5
321992	Prefabricated Wood Building Mfg.	71.4	0.0	14.3	0.0	0.0	0.0	14.3	0.0
321999	All Other Miscellaneous Wood Products Mfg.	20.2	6.1	12.0	2.0	17.4	5.2	26.7	10.3
336211	Motor Vehicle Body Mfg.	38.9	0.7	0.0	0.0	0.0	0.0	55.1	5.3
336212	Truck Trailer Mfg.	67.9	0.2	1.9	0.0	0.0	0.2	29.8	0.0
336213	Motor Home Mfg.								
336214	Travel Trailer & Camper Mfg.	62.3	4.2	1.2	9.6	3.8	0.0	3.5	15.4
336510	Railroad Rolling Stock Mfg.	52.8	0.0	11.7	0.0	0.0	0.0	24.4	11.1
336611	Ship Building & Repairing	50.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0
336612	Boat Building	18.3	2.2	4.4	0.0	3.1	3.3	68.7	0.0
337110	Wood Kitchen Cabinet & Countertop Mfg.	46.8	8.5	18.0	3.1	4.0	0.8	15.6	3.3
337121	Upholstered Household Furniture Mfg.	24.9	1.7	17.9	2.3	21.8	1.5	25.6	4.3
337122	Non-upholstered Wood Household Furniture Mfg.	31.6	20.9	16.8	2.4	7.8	0.3	20.2	0.0
337127	Institutional Furniture Mfg.	46.0	7.2	13.6	2.8	9.2	0.2	14.9	6.1
337211	Wood Office Furniture Mfg.	35.0	17.4	24.7	3.3	6.1	3.9	9.5	0.0
337212	Custom Architectural Woodwork & Millwork Mfg.	36.4	8.8	21.5	8.9	8.0	0.6	14.2	1.5
337215	Showcase, Partition, Shelving, and Locker Mfg.	5.5	5.7	5.5	0.0	11.7	0.0	71.7	0.0
337920	Blind & Shade Mfg.	40.4	3.1	14.2	0.0	13.5	0.0	21.2	7.7
Lesser-use industries									
	Average	40.0	5.7	11.0	2.3	8.1	1.0	27.8	4.1

* "Other" included mahogany, walnut, teak and hickory

6 Limitations and Recommendations

This study offers much needed updates on wood product usage for selected components of the U.S. industrial manufacturing sector. Given the breadth of individual industry sectors that potentially use at least some wood products, this task is enormous. It is perhaps not too surprising then, that other than research completed by APA - *The Engineered Wood Association* for industrial usage of structural panels, such estimates have not been publicly generated since 1977 (McKeever and Martens, 1983).

The single largest limitation of this study given the breadth of potential industrial manufacturers is limiting the analysis to 20 identified NAICS sectors. While a significant attempt was made to gather wood-use statistics from 18 “lesser wood-use” industries, the number of completed surveys was too small to produce any statistical analysis. Further, many of the individual NAICS codes had a rather small number of completed surveys for use in population wood-use estimates, particularly for wood-based panels.

While it was not possible to deal with this limitation given the budget constraints of this study, a strong recommendation for further research to increase the level of surveying for individual industrial manufacturing industries of interest.

In spite of this limitation, this study does offer the most comprehensive estimate of softwood and hardwood lumber and non-structural wood-based panel usage in industrial applications since the McKeever and Martens study for 1977. Combined with the more detailed analysis done by the APA - *The Engineered Wood Association* for structural wood-based panels, the wood products industry has fairly reliable and up-to-date information of wood usage in this significant end-use market in the U.S., both in volumes and qualifying information such as substitution trends and characteristics (component usage, species, dimensions, and so on).

As a further recommendation for research, given what has been learned from this study, it will be important to more deeply investigate individual NAICS industries where wood has a large market share, but is at threat of decline, and/or industries where wood does not have the market share that it could. A good example of the latter is Institutional Furniture Manufacturers. Follow-up studies in either case should be of a market research nature, with an attempt to quantify and qualify specific attributes that these industrial manufacturers are looking for in their input materials, and where wood products are most likely to offer a competitive solution.

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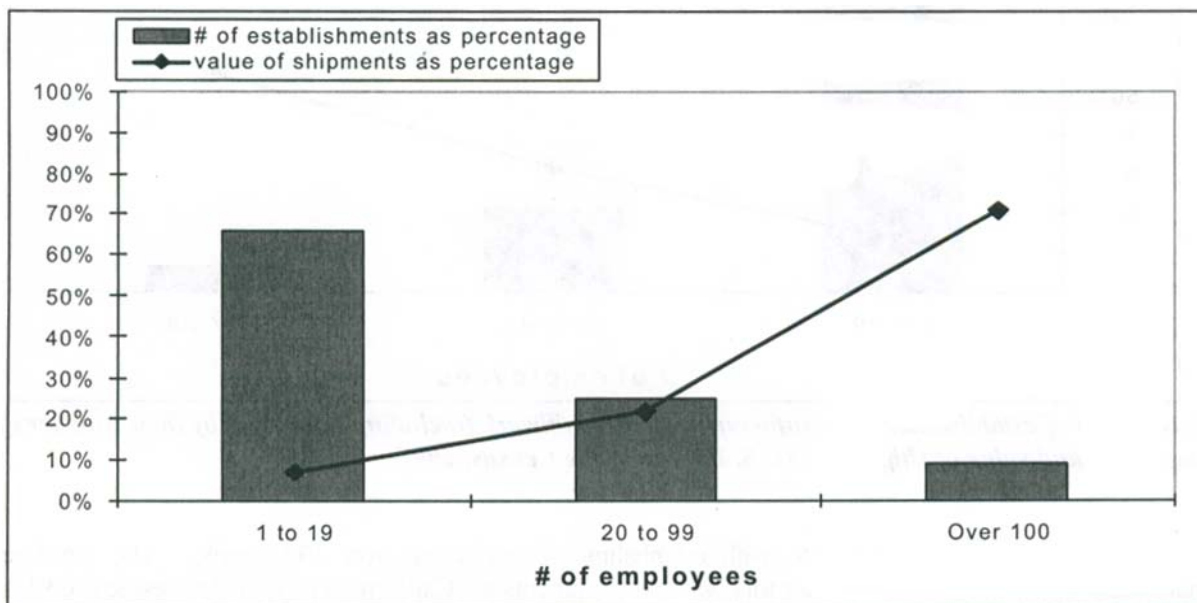
Appendix 1

Description of the primary NAICS industries investigated

Millwork

Wood Window and Door Manufacturing

The wood window and door industry (NAICS, 321911), comprises establishments primarily engaged in manufacturing window and door units, sash, window and door frames, and doors from wood or wood clad with metal or plastics. This industry has an estimated 1,408 establishments in the U.S., with annual shipments valued at approximately \$U.S. 8.7 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size, employing fewer than 20 individuals. This is reported in the figure, with the bar graph representing the number of establishments categorized by the number of employees, and the line graph representing the value of shipments in each category, both shown by percentage. It is shown that approximately two thirds, or 933 of the establishments, employ between 1 to 19 individuals, yet they are responsible for only 7.4% of the total value of shipments. As for those establishments employing 20 to 99 employees (24.4% or 344 establishments), they are responsible for 21.7% of the total value of shipments. In the case of those establishments with over 100 employees (9.3% or 131 establishments), they are responsible for 70.9% of the total value of shipments in this category, demonstrating a high degree of industry concentration.

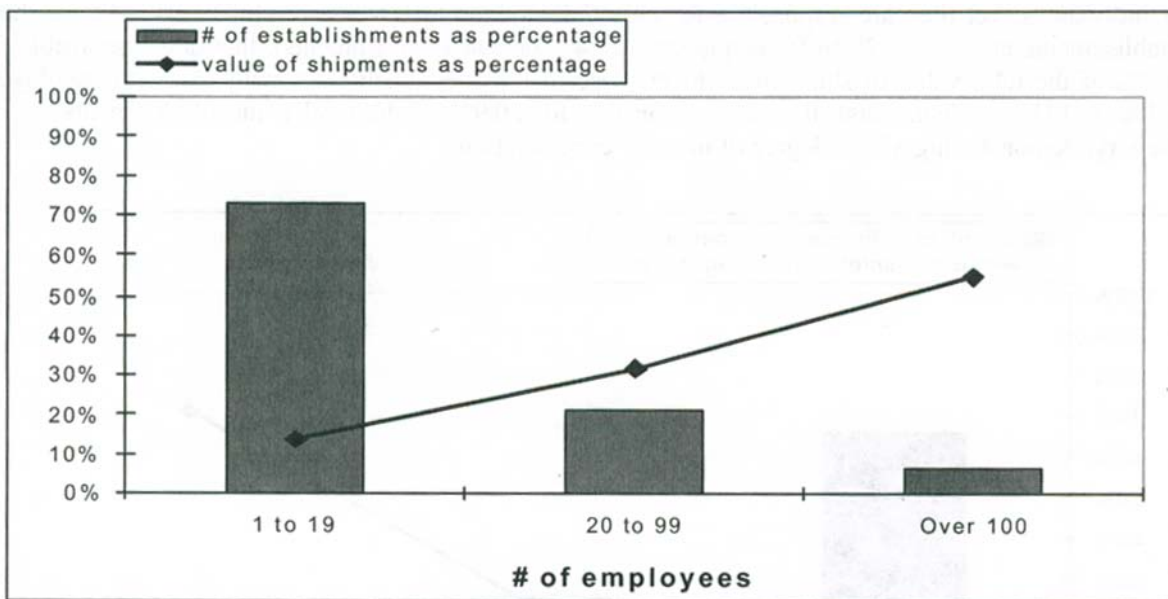


Breakdown of establishments manufacturing “wood windows and doors” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 39 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are Wisconsin (16.9%), Minnesota (15.7%) Iowa (8.2%), California (5.7%), and Oregon (5.6%).

Other Millwork (including flooring)

The “other millwork” (including flooring) industry (NAICS, 321918) represents establishments primarily engaged in manufacturing millwork (except wood windows, wood doors, and cut stock). This industry has an estimated 1,463 establishments in the U.S., with annual shipments valued at approximately \$U.S. 4.5 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are small in size employing fewer than 20 individuals. As shown in the figure, this is again a highly concentrated industry. 1,067 of the establishments employ between 1 to 19 individuals, yet they are responsible for only 13.8% of the total value of shipments. Establishments with 20 to 99 employees (21.0% or 307) are responsible for 31.6% of the total value of shipments. Establishments with 100 employees or more (6.1% or 89) represent 54.6% of the overall value of shipments.

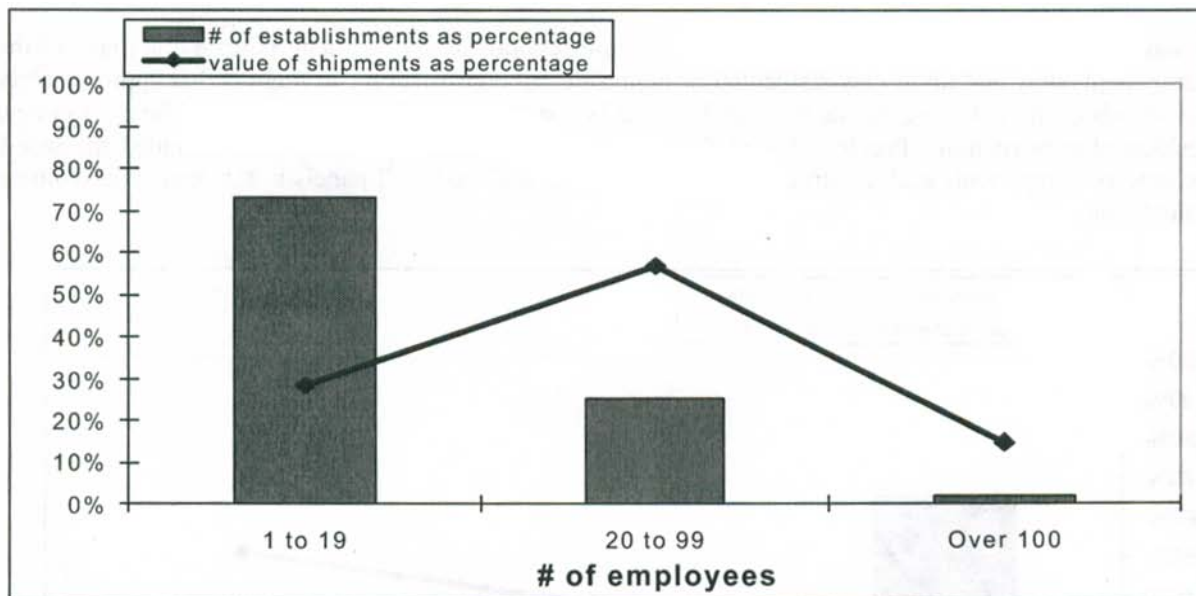


Breakdown of establishments manufacturing “other millwork (including flooring)” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 35 states in the U.S. with establishments employing over 100 people. The top five manufacturing states in terms of their total value of shipments are California (13.7%), Tennessee (10.9%), Texas (4.9%), Georgia (4.8%), and Oregon (4.4%).

Wood Container and Pallet Manufacturing

The wood container and pallet industry (NAICS, 321920) includes companies which manufacture wood pallets, wood box shooks, wood boxes, other wood containers, and wood parts for pallets and containers. This industry has an estimated 2,996 establishments in the U.S., with annual shipments valued at over \$U.S 4.5 billion (U.S. Bureau of the Census, 1997). Once again, the majority of these establishments are fairly small in size, employing fewer than 20 individuals (see the figure). 2,195 of the establishments in this industry employ between 1 to 19 individuals, yet they are responsible for only 28.5% of the total value of shipments. While the industry concentration is not as notable as with millwork, those employing between 20 to 99 employees (25.0% or 750 establishments), they are responsible for 56.9% of the total value of shipments; those with over 100 employees (1.7% or 51 establishments) are responsible for over 14.5% of the total value of shipments.



Breakdown of establishments manufacturing “wood containers & pallets” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

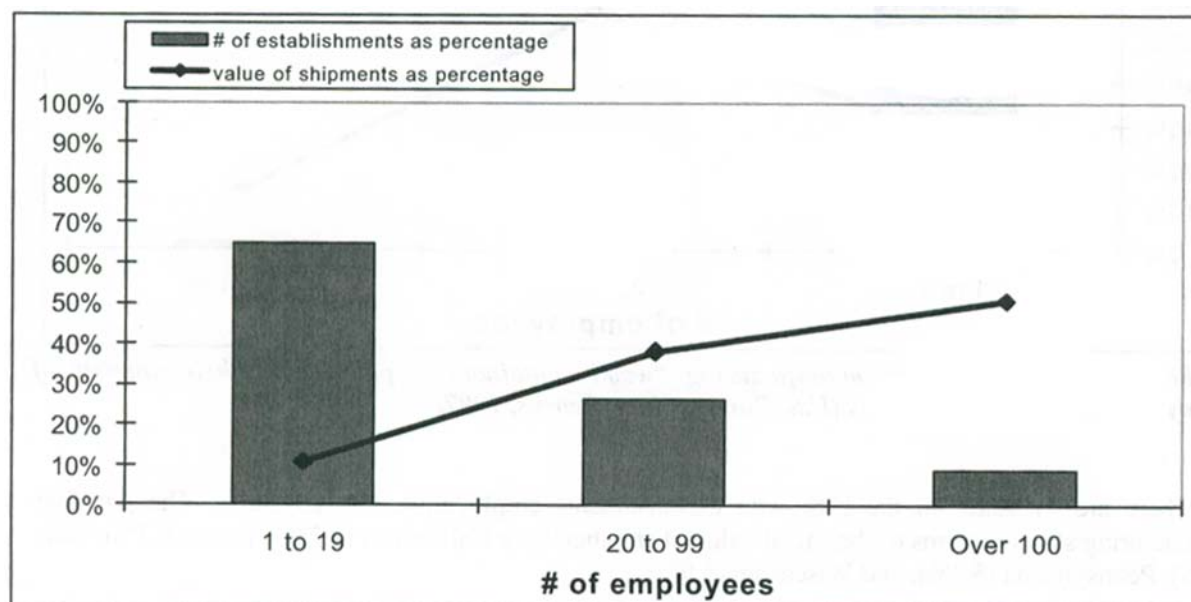
There are 41 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are California (12.2%), Texas (6.3%), Ohio (6.0%), Pennsylvania (5.4%), and Wisconsin (5.0%).

All Other Wood Product Manufacturing

Prefabricated Wood Building Manufacturing

The prefabricated wood building industry (NAICS, 321992) is made up of establishments engaged in manufacturing prefabricated wood buildings and wood sections/panels for prefabricated wood buildings. This industry has an estimated 709 establishments in the U.S., with annual shipments valued at approximately \$U.S. 3.1 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size, employing fewer than 20 individuals (see the figure). 460 of the establishments in this industry employ between 1 to 19 individuals, yet they are responsible for only 10.9% of the total value of shipments within this industry. Those establishments employing between 20 to 99 employees (26.4% or 187 establishments) are responsible for approximately 38.3% of the total value of shipments; those establishments with over 100 employees (8.7% or 62 establishments) are responsible for just over one half of the total value of shipments in this category.

It should be noted that detailed definitions of the sub-categories of this segment indicate that many of the components may end up in new residential or nonresidential construction. A guess is that approximately two-thirds of the volume estimate for Prefabricated Wood Building Manufacturing could be used in new residential construction. Previous Wood Products Council residential studies have included the wood volume of components such as structural insulated panels and stud wall panels in the residential volume calculation.

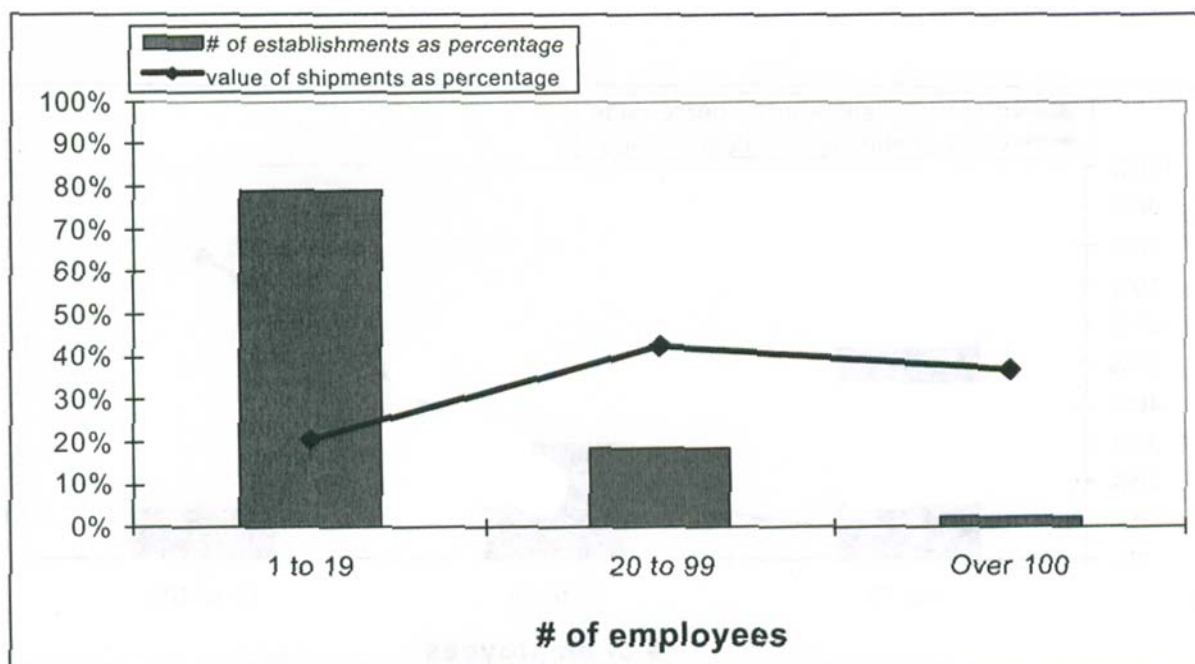


Breakdown of establishments manufacturing 'prefabricated wood buildings' by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 30 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are Pennsylvania (13.2%), Wisconsin (10.0%), California (6.0%), Maryland (4.7%) and Indiana (4.6%).

All Other Miscellaneous Wood Product Manufacturing

The “all other miscellaneous wood product” industry (NAICS, 321999) is made up of establishments engaged in manufacturing wood products, not *elsewhere specified*. There are an estimated 2,406 establishments in the U.S., with annual shipments valued at approximately \$U.S. 4.0 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size, employing fewer than 20 individuals (see the figure). 1,897 of the establishments in this industry employ between 1 to 19 individuals, yet they are responsible for only 20.6% of the total value of shipments. Those establishments employing between 20 to 99 employees (18.7% or 451 establishments) are responsible for approximately 42.5% of the total value of shipments; those with over 100 employees (2.4% or 58 establishments) are responsible for 36.9% of the total value of shipments in this industry.



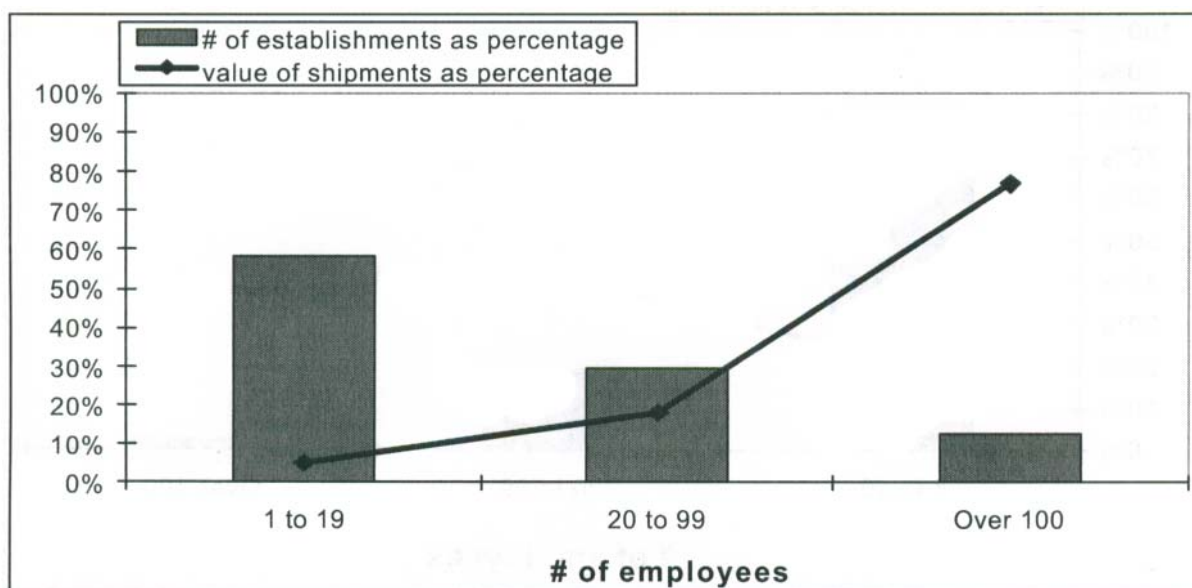
Breakdown of establishments manufacturing “all other miscellaneous wood products” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 40 states in the US. with establishments employing over 100 staff. The five top manufacturing states in terms of their total value of shipments are Ohio (15.2%), California (13.8%), Wisconsin (5.6%), Mississippi (5.1%), and Maine (4.5%).

Motor vehicle body and trailer manufacturing

Motor Vehicle Body Manufacturing

The motor vehicle body industry (NAICS, 336211) is made up of establishments engaged in manufacturing truck, bus, cab and automobile bodies. This industry has an estimated 808 establishments in the U.S., with annual shipments valued at approximately \$U.S. 8.9 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size, employing fewer than 20 individuals (see the figure). 58.0% or 469 of the establishments in this industry employ between 1 to 19 individuals, yet they are responsible for only 5.2% of the total value of shipments. Those establishments with 20 to 99 employees (29.6% or 239 establishments) are responsible for 18.1% of the total value of shipments; those establishments with over 100 employees (12.4% or 100 establishments) are responsible for 76.8% of the total value of shipments.

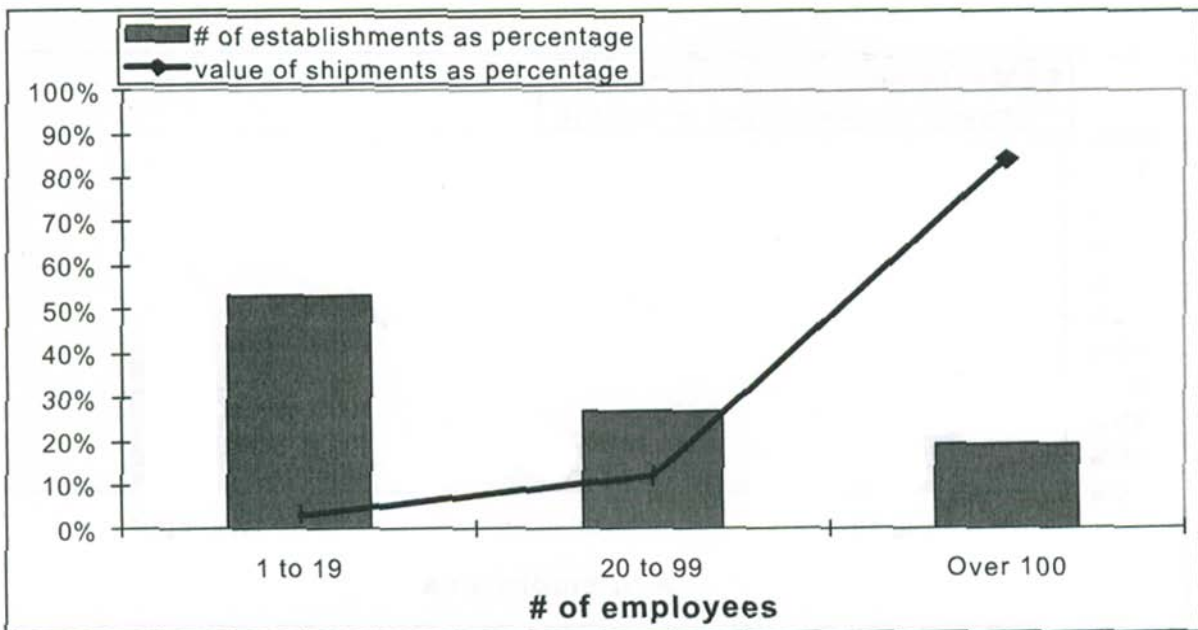


Breakdown of establishments manufacturing “motor vehicle bodies” by their number of employees and value of shipments, both shown as percentage (U.S. Bureau of the Census, 1997)

There are 22 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are California (28.9%), Indiana (7.2%), North Carolina (7.2%), Pennsylvania (6.2%), and Wisconsin (4.8%).

Truck Trailer Manufacturing

The truck trailer industry (NAICS, 336212) is made up of establishments engaged in manufacturing truck trailers, truck trailer chassis, cargo container chassis, detachable trailer bodies, and detachable trailer chassis. This industry has an estimated 388 establishments in the U.S., with annual shipments valued at approximately \$U.S. 5.5 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). Over one half or 207 of the establishments in this industry employ between 1 to 19 individuals, yet they are responsible for only 3.4% of the total value of shipments. Those establishments with 20 to 99 employees (27.1% or 105 establishments), are responsible for 12.3% of the total value of shipments; those establishments with over 100 employees (19.6% or 76 establishments) are responsible for 84.3% of the total value of shipments.

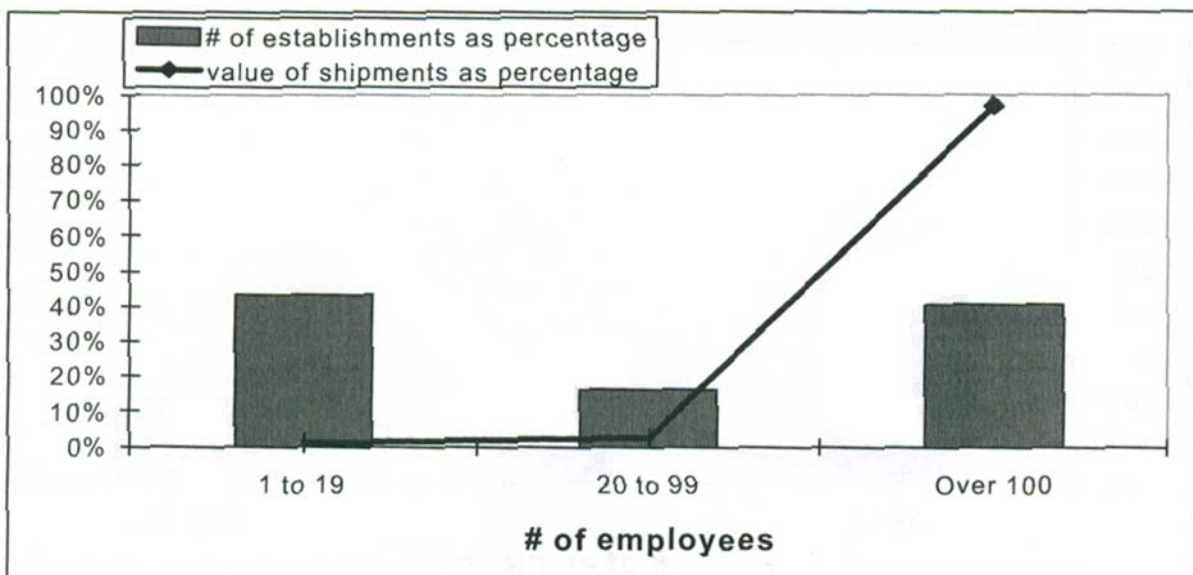


Breakdown of establishments manufacturing “truck trailers” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 19 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are Indiana (24.5%), Illinois (8.9%), Texas (6.4%), Wisconsin (5.9%), and Alabama (5.6%).

Motor Home Manufacturing

The U.S. motor home industry (NAICS, 336213) is made up of establishments engaged in manufacturing motor homes on purchased chassis and/or manufacturing conversion vans on an assembly line basis. Motor homes are units where the motor and the living quarters are integrated in the same unit. This industry has an estimated 86 establishments in the U.S., with annual shipments valued at approximately \$U.S. 3.9 billion (U.S. Bureau of the Census, 1997). This industry is typified by larger companies (see the figure). 43.0% or 37 of the establishments in this industry employ between 1 to 19 individuals, yet they are only responsible for less than 1% of the total value of shipments. Similarly those establishments with 20 to 99 employees (16.3% or 14 establishments) are only responsible for 2.5% of the total value of shipments in this industry; those establishments with over 100 employees (40.7% or 35 establishments), are responsible for 96.6% of the total value of shipments.

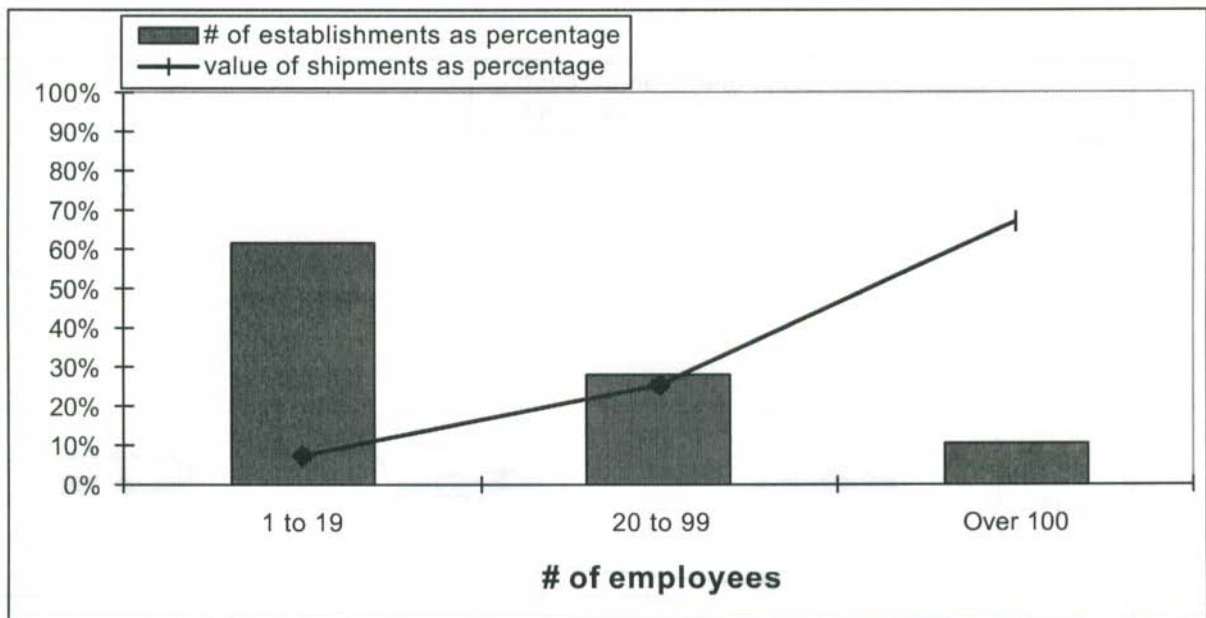


Breakdown of establishments manufacturing “motor homes” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are only 6 states in the U.S. with establishments employing over 100 staff. The top state with the highest value of annual shipments is Indiana. This state alone contributes approximately \$U.S. 1.8 billion (45%) annually to the total value of shipments within this industry.

Travel Trailer and Camper Manufacturing

The travel trailer and camper industry (NAICS, 336214) is made up of establishments engaged in one or more of the following: (1) manufacturing travel trailers and campers designed to attach to motor vehicles; (2) manufacturing pickup coaches (i.e., campers) and caps (i.e., covers) for mounting on pickup trucks; and/or (3) manufacturing automobile, utility and light-truck trailers. This industry has an estimated 806 establishments in the U.S., with annual shipments valued at approximately \$U.S. 4.3 billion (U.S. Bureau of the Census, 1997). Once again, this industry is very concentrated, with the bulk of the output coming from large firms (see the figure). 61.4% or 495 of the establishments in this industry employ between 1 to 19 individuals, they are responsible for only 7.4% of the total value of shipments. Those establishments with 20 to 99 employees (27.9% or 225 establishments) are responsible for 25.6% of the total value of shipments; those establishments employing over 100 employees (10.7% or 86 establishments) are responsible for 67.0% of the total value of shipments.

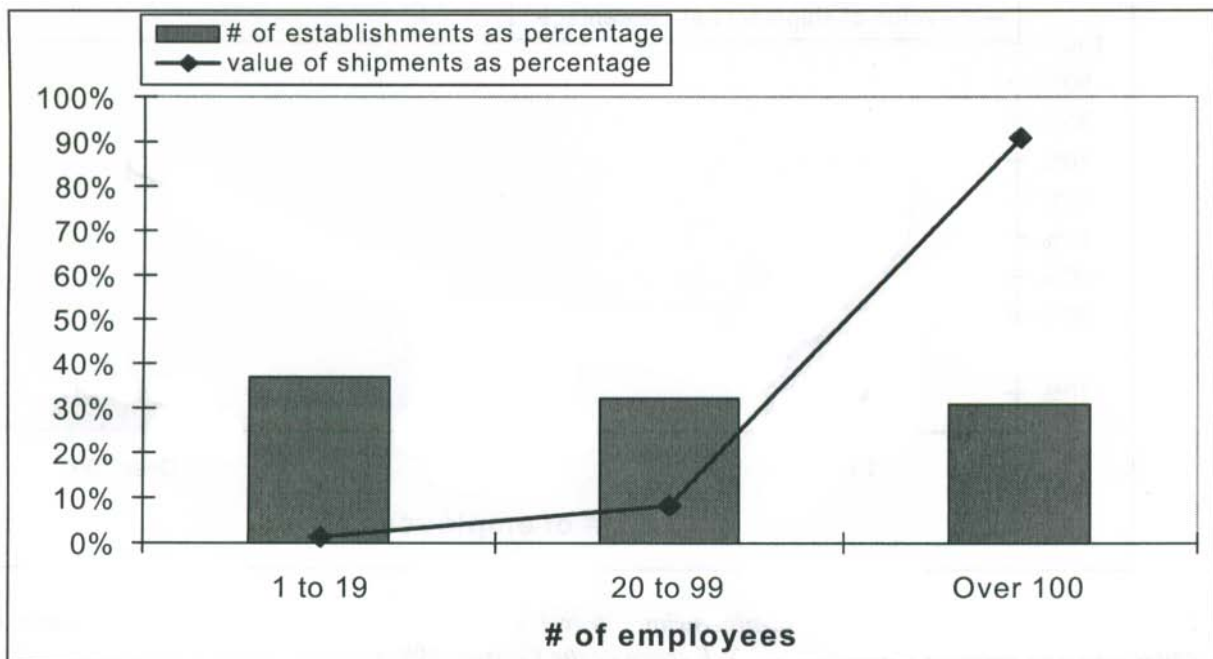


Breakdown of establishments manufacturing “travel trailers and campers” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 15 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are Indiana (31.7%), California (10.2%), Texas (5.8%), Pennsylvania (5.7%), and Oklahoma (5.3%).

Railroad Rolling Stock Manufacturing

The railroad rolling stock industry (NAICS, 336510) is made up of establishments engaged in one or more of the following: (1) manufacturing and/or rebuilding locomotives, locomotive frames and parts; (2) manufacturing railroad, street, and rapid transit cars and car equipment for operation on rails for freight and passenger service; and/or (3) manufacturing rail layers, ballast distributors, rail tamping equipment and other railway track maintenance equipment. This industry has an estimated 230 establishments in the U.S. with annual shipments valued at approximately \$U.S. 8.2 billion (U.S. Bureau of the Census, 1997). There are similar numbers of large establishments as there are small and medium ones, but again industry concentration is high (see the figure). 37.0% or 85 of the establishments in this industry employ between 1 to 19 individuals, yet they are responsible for only 1.2% of the total value of shipments. Those establishments with 20 to 99 employees (32.2% or 74 establishments), are responsible for 8.1% of the total value of shipments; those establishments with over 100 employees (30.9% or 71 establishments) are responsible for 90.7% of the total value of shipments.



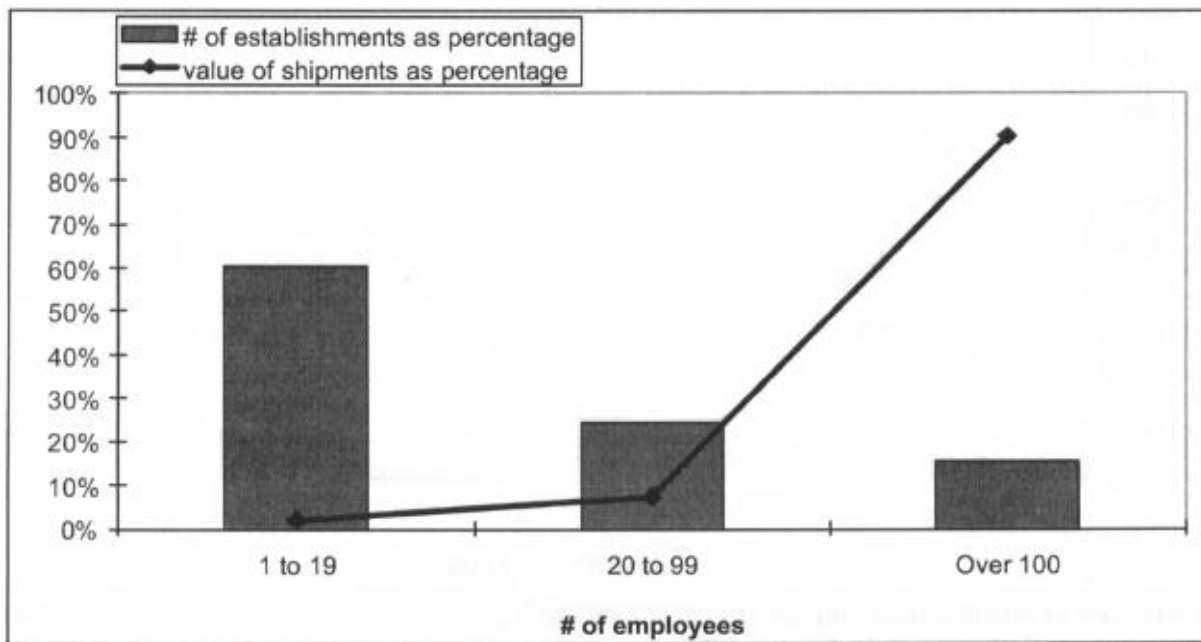
Breakdown of establishments manufacturing “railroad rolling stock” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are only 9 states in the U.S. with establishments employing over 100 staff. The top two manufacturing states are Pennsylvania (36.0%) and Illinois (22.1%).

Ship and Boat Building

Ship building and repairing

The shipbuilding and repairing industry (NAICS, 336611) is made up of establishments engaged in operating a shipyard. Activities of shipyards include the construction of ships, their repair, conversion and alteration, the production of prefabricated ship and barge sections, and specialized services, such as ship scaling. This industry has an estimated 696 establishments in the U.S. with annual shipments valued at approximately \$U.S. 10.4 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). 60.3% or 420 of the establishments in this industry employ between 1 to 19 individuals, and are responsible for only 2.2% of the total value of shipments. Those establishments with 20 to 99 employees (24.4% or 170 establishments) are responsible only for 7.5% of the total value of shipments in this industry; those establishments with over 100 employees (15.2% or 106 establishments), are responsible for 90.3% of the total value of shipments.

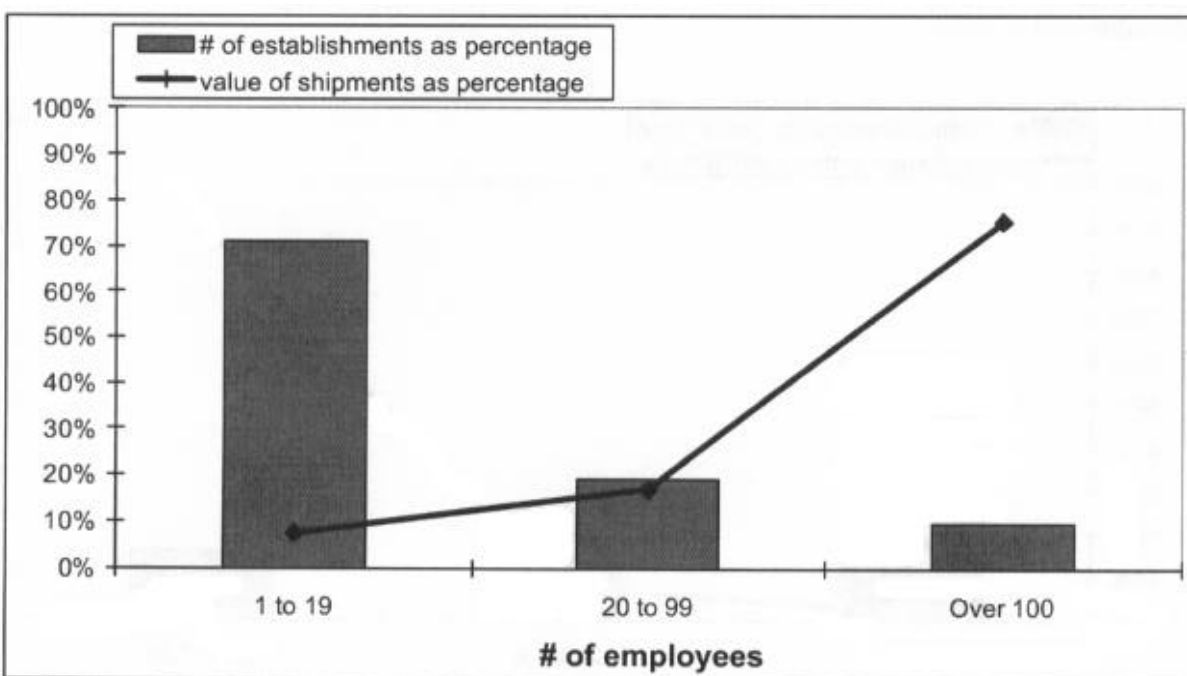


Breakdown of establishments engaged in the “ship building and repairing” industry by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 13 states in the U.S. with establishments employing over 100 staff. The top three states by sales value are Virginia (21.5%), Louisiana (15.4%), and Mississippi (12.9%).

Boat Building

The boat building industry (NAICS, 336612) is made up of establishments engaged in building boats. Boats are defined as watercraft not built in shipyards and typically of the type suitable or intended for personal use. This industry has an estimated 1,041 establishments in the U.S. with annual shipments valued at approximately \$U.S. 5.6 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). 740 of the establishments in this industry employ 1 to 19 individuals, yet they are responsible for only 7.6% of the total value of shipments annually. Those establishments employing 20 to 99 employees (19.3% or 201 establishments), are responsible for 16.9% of the value of shipments annually; those establishments with over 100 employees (9.6% or 100 establishments) are responsible for 75.5% of the total value of shipments.

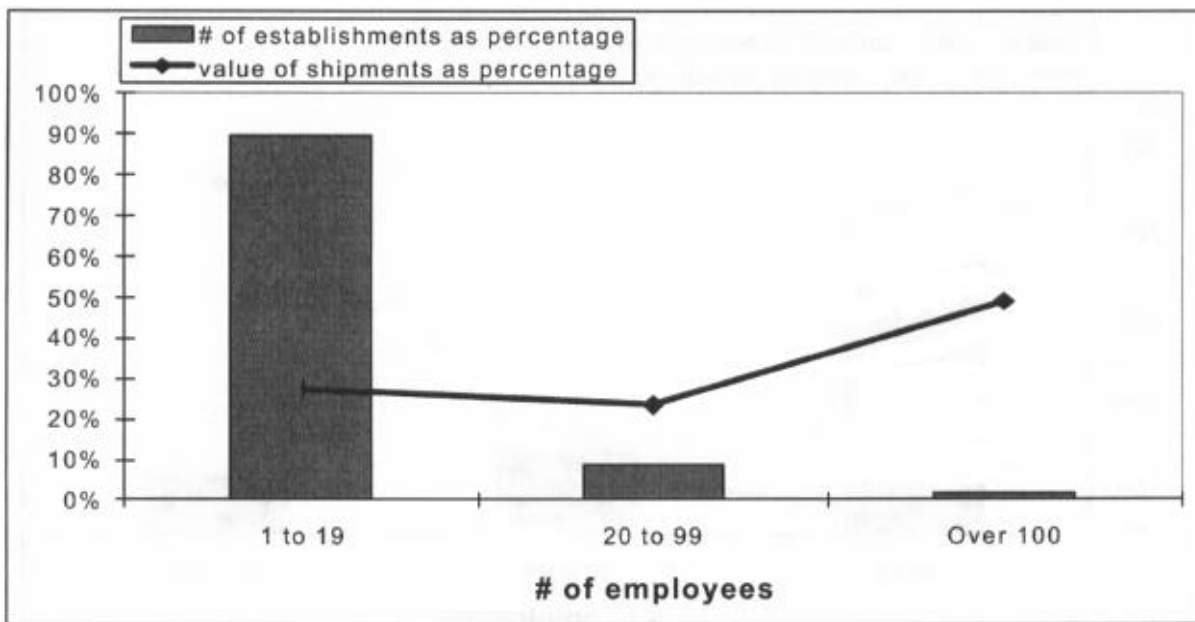


Breakdown of establishments engaged in 'boat building' by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 15 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are Florida (20.5%), Missouri (5.3%), Washington (3.4%), South Carolina (3.0%), and Maryland (2.9%).

Wood Kitchen Cabinet and Countertop Manufacturing

The wood kitchen cabinet and countertop industry (NAICS, 337110) is made up of establishments engaged in manufacturing wood or plastics laminated on wood kitchen cabinets, bathroom vanities, and countertops (except freestanding). This industry has an estimated 7,962 establishments in the U.S. with annual shipments valued at approximately \$U.S. 9.1 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). 89.5% or 7,128 of the establishments in this industry employ between 1 to 19 individuals, and are responsible for only 27.6% of the total value of shipments. Those establishments with 20 to 99 employees (8.9% or 705 establishments) are responsible for 23.5% of the total value of shipments; those establishments with over 100 employees (1.6% or 129 establishments), are responsible for 48.9% of the total value of shipments.



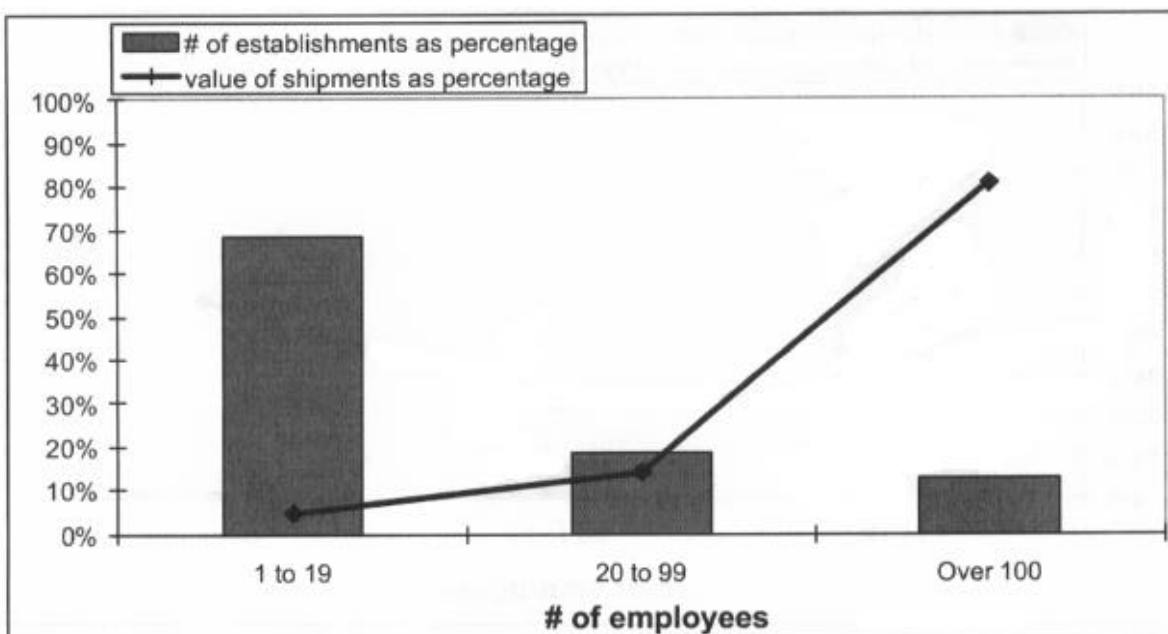
Breakdown of establishments manufacturing “wood kitchen cabinet and countertop” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 41 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are Ohio (10.5%), Texas (8.1%), Indiana (7.7%), California (7.7%) and Pennsylvania (7.3%).

Household and Institutional Furniture Manufacturing

Upholstered Household Furniture Manufacturing

The upholstered household furniture industry (NAICS, 337121) is made up of establishments engaged in manufacturing upholstered household-type furniture. This industry has an estimated 1,706 establishments in the U.S. with annual shipments valued at approximately \$U.S. 8.4 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing under 20 individuals (see the figure). Over two thirds or 1,172 of the establishments in this industry employ 1 to 19 individuals, yet they are responsible for only 4.9% of the total value of shipments annually. Those establishments employing 20 to 99 employees (18.7% or 319 establishments) are responsible for 14.3% of the value of shipments annually; those establishments with over 100 employees (12.6% or 215 establishments) are responsible for 80.8% of the total value of shipments.

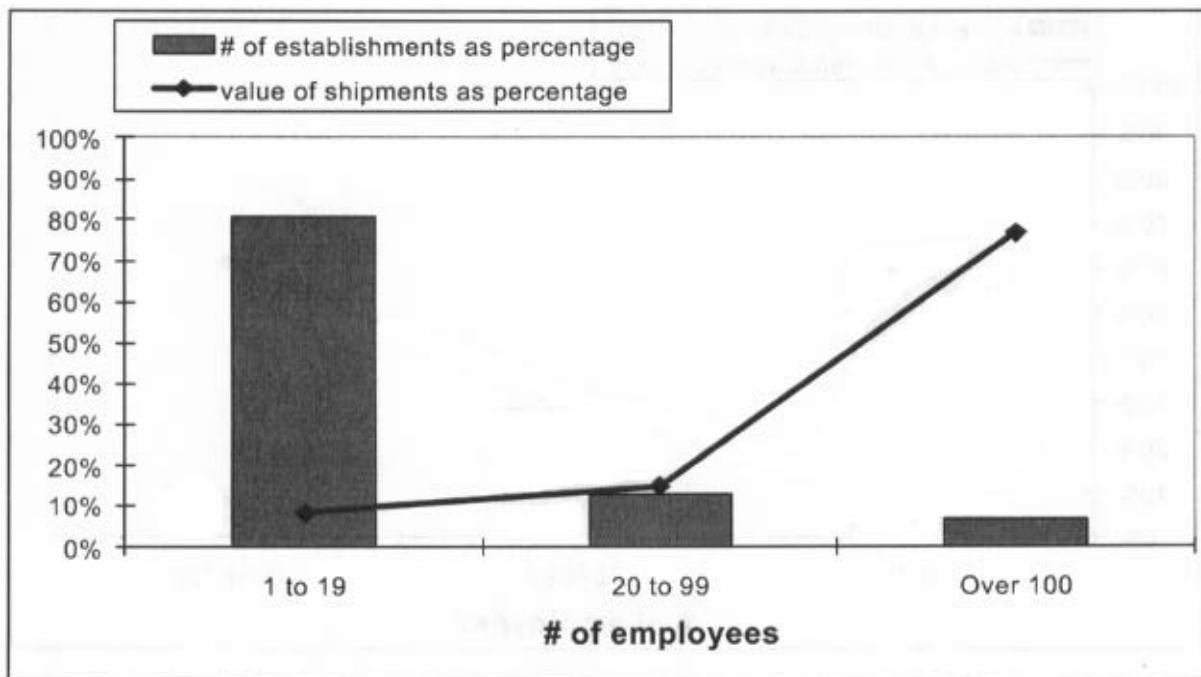


Breakdown of establishments manufacturing "Upholstered household furniture" by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are currently 30 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are North Carolina (32.1%), Mississippi (22.7%), California (10.5%), Tennessee (9.2%), and Indiana (3.2%).

Non-upholstered Wood Household Furniture Manufacturing

The non-upholstered wood household furniture industry (NAICS, 337122) is made up of establishments engaged in manufacturing nonupholstered wood household-type furniture and freestanding cabinets (except television, radio, and sewing machine cabinets). This industry has an estimated 3,849 establishments in the U.S. with annual shipments valued at approximately \$U.S. 11.3 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). 80.7% or 3,106 of the establishments in this industry employ 1 to 19 individuals, and are responsible for only 8.3% of the total value of shipments annually. Those establishments employing 20 to 99 employees (12.6% or 486 establishments) are responsible for 14.9% of the value of shipments annually; those establishments with over 100 employees (6.7% or 257 establishments), are responsible for 76.7% of the total value of shipments.

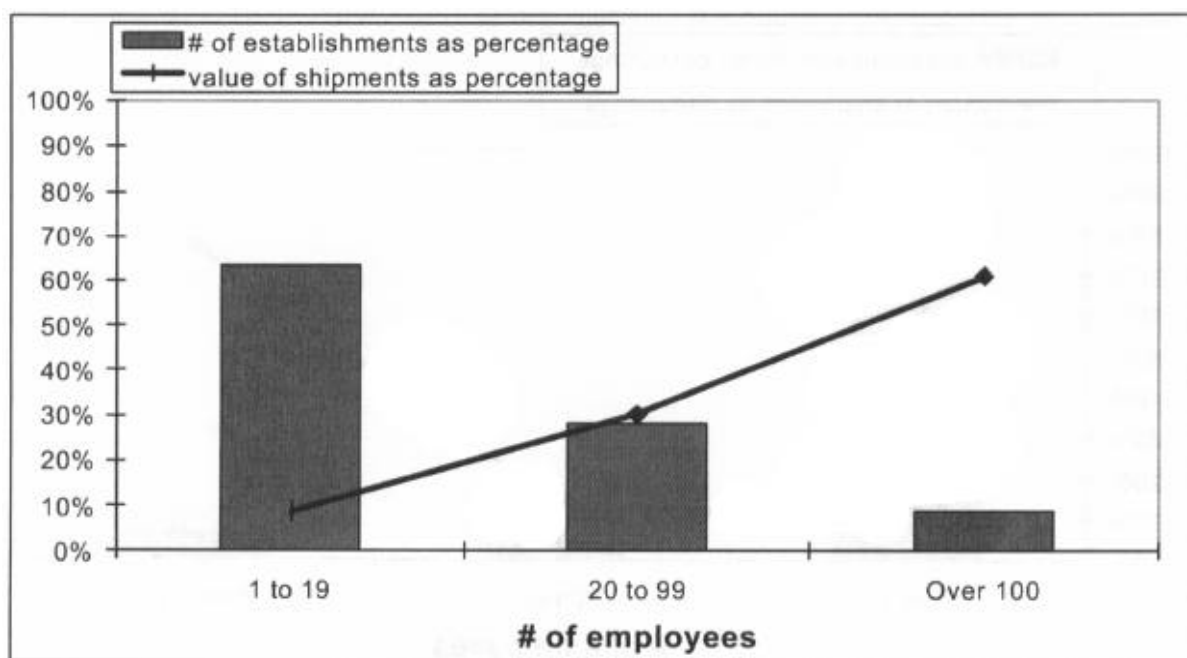


Breakdown of establishments manufacturing “non-upholstered wood household furniture” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 37 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments, not including states with disclosures, are North Carolina (24.2%), Virginia (10.4%) California (9.4%), Ohio (6.2%), and New York (5.9%).

Institutional Furniture Manufacturing

The institutional furniture industry (NAICS, 337127) is made up of establishments engaged in manufacturing institutional-type furniture (e.g., library, school, theater, and church furniture). This industry has an estimated 997 establishments in the U.S. with annual shipments valued at approximately \$U.S. 3.9 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). Two thirds or 631 of the establishments in this industry employ 1 to 19 individual, yet they are responsible for only 8.8% of the total value of shipments in this industry. Those establishments employing 20 to 99 employees (28.1% or 280 establishments) are responsible for 30.2% of the value of shipments annually; those establishments with over 100 employees (8.6% or 86 establishments) are responsible for 61.0% of the total value of shipments.

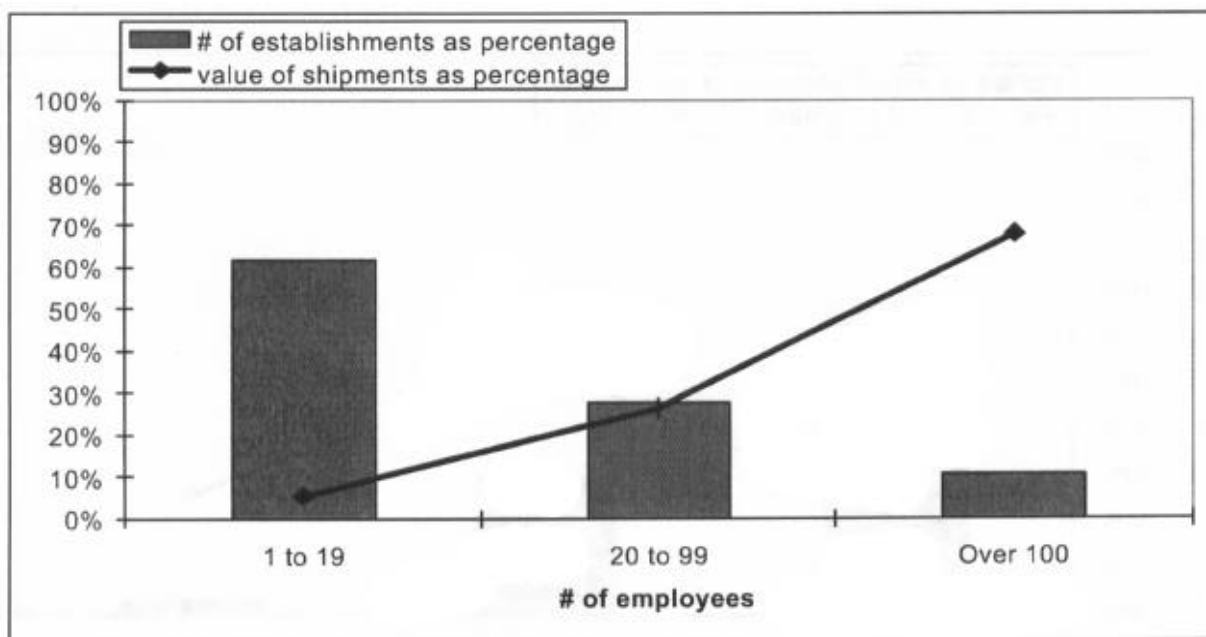


Breakdown of establishments manufacturing “institutional furniture” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 31 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are California (11.1%), Michigan (8.9%), Arkansas (6.8%), Pennsylvania (6.7%), and Texas (6.4%).

Wood Office Furniture (Including Fixture) Manufacturing

The wood office furniture (including fixture) industry (NAICS, 337211) is made up of an estimated 676 establishments in the U.S. with annual shipments valued at approximately \$U.S. 3.1 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). 61.7% or 417 of the establishments in this industry employ 1 to 19 individuals, yet they are responsible for only 5.7% of the total value of shipments annually. Those establishments employing 20 to 99 employees (27.7% or 187 establishments) are responsible for 26.4% of the value of shipments annually; those establishments with over 100 employees (10.7% or 72 establishments) are responsible for 69.7% of the total value of shipments.

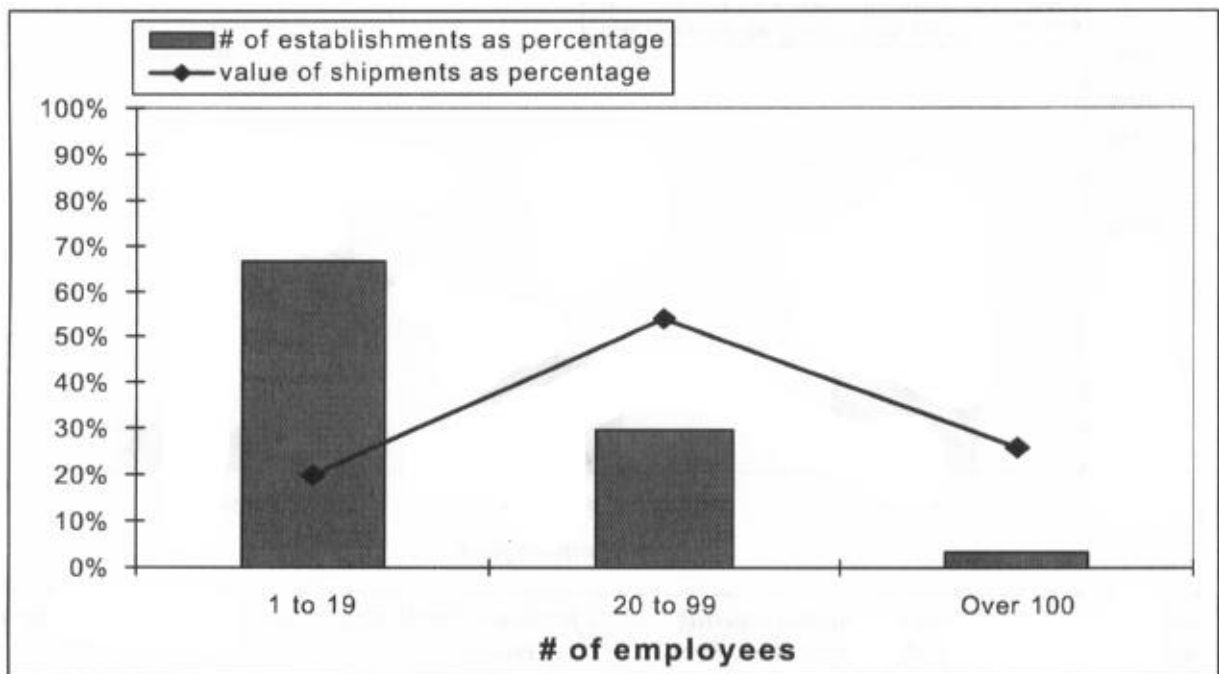


Breakdown of establishments manufacturing “office furniture (including fixtures)” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 21 states in the U.S. with establishments employing over 100 employees. The top five manufacturing states in terms of their total value of shipments are Indiana (17.7%), North Carolina (14.4%), California (9.4%), Michigan (7.6%), and New York (4.9%).

Custom Architectural Woodwork & Millwork Manufacturing

The custom architectural woodwork & millwork industry (NAICS, 337212) is made up of establishments engaged in manufacturing custom designed interiors, including architectural woodwork and fixtures utilizing wood, wood products, and plastics laminates. This industry has an estimated 1,100 establishments in the U.S. with annual shipments valued at approximately \$U.S. 2.2 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). Two thirds or 732 of the establishments in this industry employ 1 to 19 individuals, and are responsible for 20.1% of the total value of shipments annually. Those establishments employing 20 to 99 employees (29.9% or 329 establishments) are responsible for 54.1% of the total value of shipments; those establishments with over 100 employees (3.5% or 39 establishments) are responsible for 25.8% of the total value of shipments.

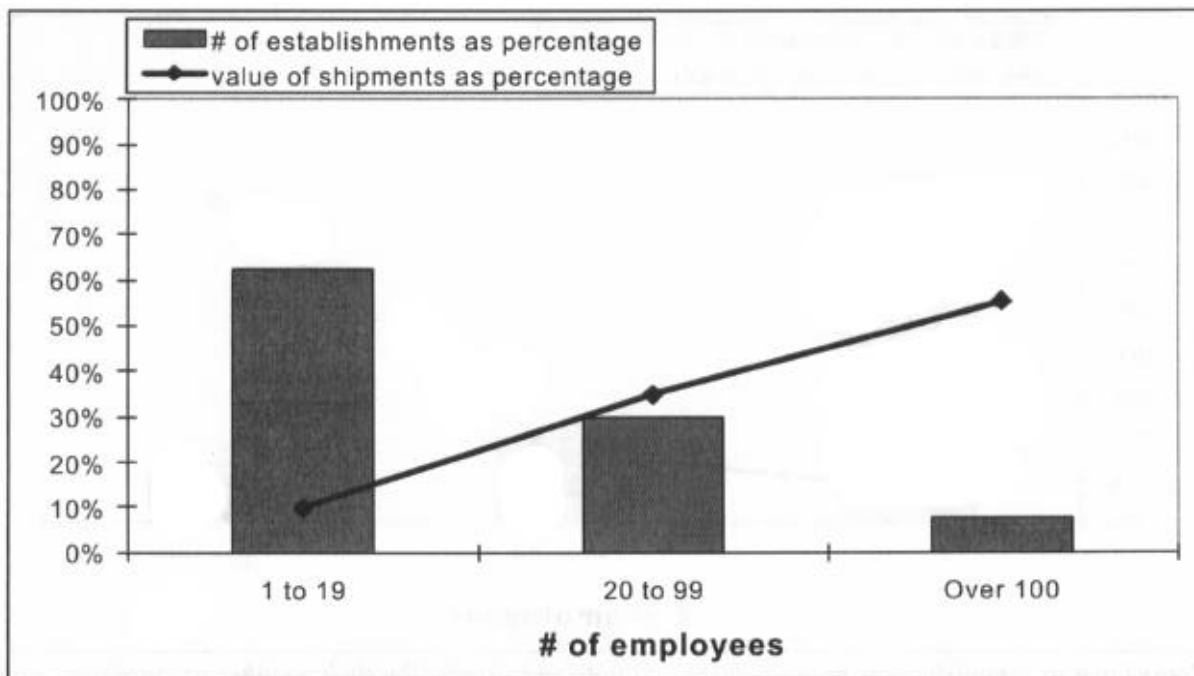


Breakdown of establishments manufacturing “Custom architectural woodwork & millwork” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 28 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are California (9.9%), Pennsylvania (6.6%), New York (5.1%), Oklahoma (4.4%), and Florida (3.9%).

Showcase, Partition, Shelving, and Locker Manufacturing

The showcase, partition, shelving and locker industry (NAICS, 337215) is made up of establishments engaged in manufacturing wood and non-wood office and store fixtures, shelving, lockers, frames, partitions, and related fabricated products of wood and non-wood materials, including plastic laminated fixture tops. This industry has an estimated 2,156 establishments in the U.S. with annual shipments valued at approximately \$U.S. 8.0 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). Nearly two thirds or 1,344 establishments in this industry employ 1 to 19 people, yet they are responsible for only 10.0% of the total value of shipments annually. Those establishments employing 20 to 99 employees (29.9% or 645 establishments) are responsible for 34.8% of the value of shipments annually; those establishments with over 100 employees (7.7% or 167 establishments) are responsible for 55.2% of the total value of shipments.



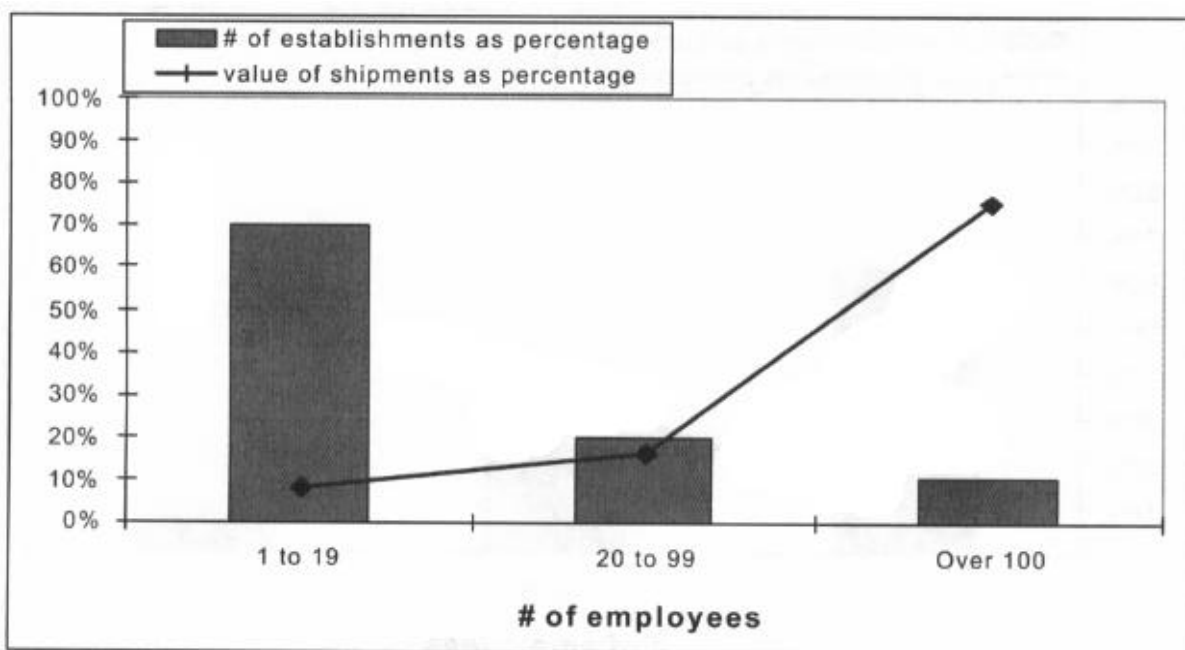
Breakdown of establishments manufacturing “showcases, partitions, shelving, and lockers” by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 26 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are Illinois (12.6%), California (10.9%), Ohio (7.4%), New York (6.3%), and Michigan (5.0%).

Other Furniture Related Product Manufacturing

Blind and Shade Manufacturing

The blind and shade industry (NAICS, 337920) is made up of establishments engaged in manufacturing one or more of the following: Venetian blinds, other window blinds, shades; curtain and drapery rods, poles; and/or curtain and drapery fixtures. This industry has an estimated 486 establishments in the U.S. with annual shipments valued at approximately \$U.S. 2.4 billion (U.S. Bureau of the Census, 1997). The majority of these establishments are fairly small in size employing fewer than 20 individuals (see the figure). 70% or 340 of the establishments in this industry employ 1 to 19 individuals, yet they are responsible for only 8.0% of the total value of shipments in this industry. Those establishments employing 20 to 99 employees (19.8% or 96 establishments) are responsible for 16.5% of the value of shipments annually; those establishments with over 100 employees (10.3% or 50 establishments) are responsible for 75.4% of the total value of shipments.



Breakdown of establishments manufacturing 'blinds and shades' by their number of employees and value of shipments (U.S. Bureau of the Census, 1997)

There are 18 states in the U.S. with establishments employing over 100 staff. The top five manufacturing states in terms of their total value of shipments are California (19.2%), Texas (10.5%), Illinois (9.1%), Florida (6.7%), and Pennsylvania (6.3%).

Appendix 2

The phone survey template

Interviewer # _____

Name of Company

Contact Person

Location/Phone

Industry Type

NAICS Code

INDUSTRIAL MARKET STUDY

1. Is the primary business of your company (name of industry type) manufacturing? By primary, we are asking if 50% or more of your sales are in this industry.

A. _____ Yes

B. _____ No

C. _____ Don't know/no response

(terminate interview if no or don't know)

2. Does your company purchase any of the following wood products?

Softwood Lumber

☐ Yes ☐ No

Hardwood Lumber

☐ Yes ☐ No

Softwood Plywood

☐ Yes ☐ No

Hardwood Plywood

☐ Yes ☐ No

Oriented Strand Board

☐ Yes ☐ No

Particleboard

☐ Yes ☐ No

Medium Density Fiberboard

☐ Yes ☐ No

Hardboard

☐ Yes ☐ No

Laminated Veneer Lumber

☐ Yes ☐ No

Other (e.g. parallam, timberstrand)

☐ Yes ☐ No

3. Does your company have more than one plant?

☐ Yes _____ # of plants

☐ No → Go to question #5

4. What percentage of your company's total sales volume does your plant contribute?
_____ %

All questions in this survey are directed to your own individual plant only.

5. In the year 2000 what proportion of your wood purchases by value were pre-manufactured components versus uncut lumber or panels?

Pre-manufactured components _____ %

Uncut lumber/panels _____ %

6. We now have some specific questions on various types of wood products and volumes used.

SOFTWOOD LUMBER

SWL1. What was the total volume of Softwood Lumber your plant used in the year 2000*?

*Measuring Units	
1. _____	Board Feet
2. _____	Linear Feet
3. _____	Cubic Feet
4. _____	Cubic Meters
5. _____	Carloads
6. _____	Truckloads
7. _____	Units/Bundles/Lifts
8. _____	Pieces
9. _____	Other (_____)
10. _____	Don't know/No response

SWL2. Roughly how much did you pay for the volume of Softwood Lumber you used in the year 2000?

\$U.S. _____

SWL3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?

{If “stayed the same or don’t know” was selected go to SWL4}

(B) By what percentage?

Part (A)

- ☐ Increased
☐ Decreased
☐ Stayed the same
☐ Don't Know



- ☐ 21 to 50%
☐ 51 to 100%

% _____ Other

SWL4. (A) Do you predict that your consumption of Softwood Lumber will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?

{If “stayed the same or don’t know” was selected go to SWL5}

(B) By what percentage?

Part (A)

- ☐ Increase
☐ Decrease
☐ Stay the same
☐ Don't Know

Part (B)

- ☐ Less than 10%
☐ 10 to 20%

- ☐ 21 to 50%
☐ 51 to 100%

% _____ Other

SWL5. (A) In the year 2000, for which of the following applications did you use Softwood Lumber?
(B) What percentage of your total use by volume of Softwood Lumber was used in each application?

	Part (A)		Part (B)	
Components in manufacturing	☐ Yes	☐ No	_____ %	← If YES go to SWL6 otherwise go to SWL7
Jigs & Pattern	☐ Yes	☐ No	_____ %	
Packaging or Crating	☐ Yes	☐ No	_____ %	
Other _____	☐ Yes	☐ No	_____ %	
Total			100 %	

SWL6. Please tell me what percentage of your Softwood Lumber used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

SWL7. (A) Have you ever substituted another raw material for Softwood Lumber?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which Softwood Lumber was replaced and tell me why?

SWL8. (A) Have you ever substituted Softwood Lumber for another raw material?

☐ Yes → Go to(B)
☐ No

(B) Please name the raw material for which Softwood Lumber was substituted and tell me why you made the substitution.

SWL9. Could you please tell me the thickness of Softwood Lumber you purchase most frequently?

_____ 1" thickness or less
_____ Greater than 1" and up to 2"
_____ More than 2"

SWL10. Could you tell me the species of Softwood Lumber you purchase by percent volume?

- | | |
|---|---------|
| ☐ Canadian SPF (Spruce-Pine-Fir) | _____ % |
| ☐ Hemlock (Hem-fir) | _____ % |
| ☐ Douglas Fir | _____ % |
| ☐ Yellow Cedar / Cyprus | _____ % |
| ☐ Western Red Cedar / California Redwood | _____ % |
| ☐ Sitka Spruce | _____ % |
| ☐ Southern Yellow Pine | _____ % |
| ☐ Other _____ | _____ % |
| Total | 100 % |

{If the respondent has trouble recognizing some of the Softwood Lumber species listed above, then please offer them the more general list below}

- | | |
|---|---------|
| ☐ Canadian Softwood Lumber | _____ % |
| ☐ U.S. West Softwood Lumber | _____ % |
| ☐ U.S. South Softwood Lumber | _____ % |
| ☐ Other _____ | _____ % |
| ☐ Don't Know / No Response | |
| Total | 100 % |

SWL11. Do you use any treated Softwood Lumber?

- ☐ Yes  If Yes _____ %
- ☐ No

HARDWOOD LUMBER

HWL1. What was the total volume of Hardwood Lumber your plant used in the year 2000*?

*Measuring Units	
1.	_____ Board Feet
2.	_____ Linear Feet
3.	_____ Cubic Feet
4.	_____ Cubic Meters
5.	_____ Carloads
6.	_____ Truckloads
7.	_____ Units/Bundles/Lifts
8.	_____ Pieces
9.	_____ Other (_____)
10.	_____ Don't know/no response

HWL2. Roughly how much did you pay for the volume of Hardwood Lumber you used in the year 2000?

\$U.S. _____

HWL3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?

{If “stayed the same or don’t know” was selected, go to HWL4}

(B) By what percentage?

Part (A)		Part (B)		
☐ Increased	→	☐ Less than 10%	☐ 21 to 50%	% _____ Other
☐ Decreased		☐ 10 to 20%	☐ 51 to 100%	
☐ Stayed the same				
☐ Don’t Know				

HWL4. (A) Do you predict that your consumption of Hardwood Lumber will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?

{If “stayed the same or don’t know” was selected, go to SWL5}

(B) By what percentage?

Part (A)		Part (B)		
☐ Increase	→	☐ Less than 10%	☐ 21 to 50%	% _____ Other
☐ Decrease		☐ 10 to 20%	☐ 51 to 100%	
☐ Stay the same				
☐ Don’t Know				

HWL5. (A) In the year 2000, for which of the following applications did you use Hardwood Lumber?

(B) What percentage of your total use by volume of Hardwood Lumber was used in each application?

	Part (A)		Part (B)	
Components in manufacturing	☐ Yes	☐ No	_____ %	← If YES go to HWL6 otherwise go to HWL7
Jigs & Pattern	☐ Yes	☐ No	_____ %	
Packaging or Crating	☐ Yes	☐ No	_____ %	
Other _____	☐ Yes	☐ No	_____ %	
Total			100%	

HWL6. Please tell me what percentage of your Hardwood Lumber used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

HWL7. (A) Have you ever substituted another raw material for Hardwood Lumber?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material and tell me why?

HWL8. (A) Have you ever substituted Hardwood Lumber for another raw material?

- ☐ Yes —————→ Go to (B)
☐ No

(B) Please name the raw material for which Hardwood Lumber was substituted and tell me why you made the substitution.

HWL9. Could you please tell me the thickness of Hardwood Lumber you purchase most frequently?

- _____ 1" thickness or less
_____ Greater than 1" and up to 2"
_____ More than 2"

HWL10. Could you tell me the species of Hardwood Lumber you purchase by percent volume?

- | | |
|--|---------|
| ☐ Oak | _____ % |
| ☐ Cherry | _____ % |
| ☐ Maple | _____ % |
| ☐ Birch | _____ % |
| ☐ Aspen / Poplar / Cottonwood | _____ % |
| ☐ Beech | _____ % |
| ☐ Other _____ | _____ % |
| Total | 100 % |

{If the respondent has trouble recognizing some of the Hardwood Lumber species listed above, then please offer them the more general list below}

- | | |
|---|---------|
| ☐ Canadian Hardwood Lumber | _____ % |
| ☐ U.S. Hardwood Lumber | _____ % |
| ☐ Other | _____ % |
| ☐ Don't Know / No Response | _____ % |
| Total | 100 % |

SOFTWOOD PLYWOOD**SWP1.** What was the total volume of Softwood Plywood your plant used in the year 2000*?

*Measuring Units	
1. _____	Square Feet (ask for thickness)
2. _____	Square Meters (ask for thickness)
3. _____	Carloads
4. _____	Truckloads
5. _____	Units/Bundles/Lifts
6. _____	Other (_____)
7. _____	Don't know/no response

SWP2. Roughly how much did you pay for the volume of Softwood Plywood you used in the year 2000?

\$U.S. _____

SWP3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?**{If "stayed the same or don't know" was selected, go to SWP4}**

(B) By what percentage?

Part (A)	Part (B)	
☐ Increased	→ ~~10 to 20%~~	☐ 21 to 50%
☐ Decreased		☐ 51 to 100%
☐ Stayed the same		% _____ Other
☐ Don't Know		

SWP4. (A) Do you predict that your consumption of Softwood Plywood will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?**{If "stayed the same or don't know" was selected go to SWP5}**

(B) By what percentage?

Part (A)	Part (B)	
☐ Increase	→	☐ Less than 10%
☐ Decrease		☐ 10 to 20%
☐ Stay the same		☐ 21 to 50%
☐ Don't Know		☐ 51 to 100%
		% _____ Other

SWP5. (A) In the year 2000, for which of the following applications did you use Softwood Plywood?

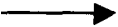
(B) What percentage of your total use by volume of Softwood Plywood was used in each application?

	Part (A)		Part (B)	
Components in manufacturing	☐ Yes	☐ No	_____ %	← If YES go to SWP6 otherwise go to SWP7
Jigs & Pattern	☐ Yes	☐ No	_____ %	
Packaging or Crating	☐ Yes	☐ No	_____ %	
Other _____	☐ Yes	☐ No	_____ %	
Total			100%	

SWP6. Please tell me what percentage of your Softwood Plywood used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

SWP7. (A) Have you ever substituted another raw material for Softwood Plywood?

☐ Yes  Go to (B)
☐ No

(B) Please name the raw material for which Softwood Lumber was replaced and tell me why?

SWP8. (A) Have you ever substituted Softwood Plywood for another raw material?

☐ Yes  Go to (B)
☐ No

(B) Please name the raw material for which Softwood Plywood was substituted and tell me why you made the substitution.

SWP9. (A) In the year 2000, did you purchase Softwood Plywood with the following descriptions?

(B) What percentage of your total volume of Softwood Plywood purchase included:

	Part (A)		Part (B)
Preservative treated	☐ Yes	☐ No	_____ %
Fire retardant treated	☐ Yes	☐ No	_____ %
Not treated	☐ Yes	☐ No	_____ %
Other treatment _____	☐ Yes	☐ No	_____ %
☐ Don't Know			

SWP10. (A) In the year 2000, did you purchase Softwood Plywood with the following descriptions?

(B) What percentage of your total volume of Softwood Plywood purchase included:

	Part (A)		Part (B)
Sanded	☐ Yes	☐ No	_____ %
Touch Sanded	☐ Yes	☐ No	_____ %
Not Sanded	☐ Yes	☐ No	_____ %
Overlay (i.e. Plastic, veneer, melamine, etc.)	☐ Yes	☐ No	_____ %

HARDWOOD PLYWOOD

HWP1. What was the total volume of Hardwood Plywood your plant used in the year 2000*?

*Measuring Units	
1.	_____ Square Feet (ask for thickness)
2.	_____ Square Meters (ask for thickness)
3.	_____ Carloads
4.	_____ Truckloads
5.	_____ Units/Bundles/Lifts
6.	_____ Other (_____)
7.	_____ Don't know/no response

HWP2. Roughly how much did you pay for the volume of Hardwood Plywood you used in the year 2000?

\$U.S. _____

HWP3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?

If "stayed the same or don't know" was selected, go to HWP4):

(B) By what percentage?

Part (A)

☐ Increased

☐ Decreased

☐ Stayed the same

☐ Don't Know

Part (B)

☐ Less than 10%

☐ 10 to 20%

☐ 21 to 50%

☐ 51 to 100%

% _____ Other

HWP4. (A) Do you predict that your consumption of Hardwood Plywood will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?

If "stayed the same or don't know" was selected, go to HWP5):

(B) By what percentage?

Part (A)

☐ Increase

☐ Decrease

☐ Stay the same

☐ Don't Know

Part (B)

☐ Less than 10%

☐ 10 to 20%

☐ 21 to 50%

☐ 51 to 100%

% _____ Other

HWP5. (A) In the year 2000, for which of the following applications did you use Hardwood Plywood?
(B) What percentage of your total use by volume of Hardwood Plywood was used in each application?

	Part (A)	Part (B)	
Components in manufacturing	☐ Yes	☐ No	_____ %
Jigs & Pattern	☐ Yes	☐ No	_____ %
Packaging or Crating	☐ Yes	☐ No	_____ %
Other	☐ Yes	☐ No	_____ %
Total			100 %

← If YES go to HWP6
otherwise go to HWP7

HWP6. Please tell me what percentage of your Hardwood Plywood used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

HWP7. (A) Have you ever substituted another raw material for Hardwood Plywood?

- ☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which Hardwood Plywood was replaced and tell me why?

HWP8. (A) Have you ever substituted Hardwood Plywood for another raw material?

- ☐ Yes Go to (B)
☐ No

(B) Please name the raw material for which Hardwood Plywood was substituted and tell me why you made the substitution.

ORIENTED STRAND BOARD (OSB)

OSB1. What was the total volume of Oriented Strand Board (OSB) your plant used in the year 2000*?

*Measuring Units	
1.	_____ Square Feet (ask for thickness)
2.	_____ Square Meters (ask for thickness)
3.	_____ Carloads
4.	_____ Truckloads
5.	_____ Units/Bundles/Lifts
6.	_____ Other (_____)
7.	_____ Don't know/no response

OSB2. Roughly how much did you pay for the volume of OSB you used in the year 2000?

\$U.S. _____

OSB3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?

If "stayed the same or don't know" was selected, go to OSB4):

(B) By what percentage?

Part (A) ☐ Increased ☐ Decreased ☐ Stayed the same ☐ Don't Know	→	Part (B) ☐ Less than 10% ☐ 10 to 20% ☐ 21 to 50% ☐ 51 to 100% % _____ Other
--	----------	--

OSB4. (A) Do you predict that your consumption of OSB will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?

If "stayed the same or don't know" was selected, go to OSB 5):

(B) By what percentage?

Part (A) ☐ Increase ☐ Decrease ☐ Stay the same ☐ Don't Know	→	Part (B) ☐ Less than 10% ☐ 10 to 20% ☐ 21 to 50% ☐ 51 to 100% % _____ Other
--	----------	--

OSB5. (A) In the year 2000, for which of the following applications did you use OSB?
(B) What percentage of your total use by volume of OSB was used in each application?

	Part (A)	Part (B)	
Components in manufacturing	☐ Yes ☐ No	_____ %	← If YES go to OSB6 Otherwise go to OSB7
Jigs & Pattern	☐ Yes ☐ No	_____ %	
Packaging or Crating	☐ Yes ☐ No	_____ %	
Other _____	☐ Yes ☐ No	_____ %	
Total		100 %	

OSB6. Please tell me what percentage of your OSB used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

OSB7. (A) Have you ever substituted another raw material for OSB?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which OSB was replaced and tell me why?

OSB8. (A) Have you ever substituted OSB for another raw material?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which OSB was substituted and tell me why you made the substitution

OSB9. (A) In the year 2000, did you purchase OSB with the following descriptions?

(B) What percentage of your total volume of OSB purchase included:

	Part (A)	Part (B)
Preservative treated	☐ Yes ☐ No	_____ %
Fire retardant treated	☐ Yes ☐ No	_____ %
Not treated	☐ Yes ☐ No	_____ %
Other treatment _____	☐ Yes ☐ No	_____ %
☐ Don't Know		

PARTICLEBOARD

PB1. What was the total volume of Particleboard your plant used in the year 2000*?

*Measuring Units	
1.	_____ Square Feet (ask for thickness)
2.	_____ Square Meters (ask for thickness)
3.	_____ Carloads
4.	_____ Truckloads
5.	_____ Units/Bundles/Lifts
6.	_____ Other (_____)
7.	_____ Don't know/no response

PB2. Roughly how much did you pay for the volume of Particleboard you used in the year 2000?

\$U.S. _____

PB3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?

{If "stayed the same or don't know" was selected, go to PB4}:

(B) By what percentage?

Part (A)	Part (B)	
☐ Increased	☐ Less than 10%	☐ 21 to 50%
☐ Decreased	☐ 10 to 20%	☐ 51 to 100%
☐ Stayed the same		% _____ Other
☐ Don't Know		

PB4. (A) Do you predict that your consumption of Particleboard will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?

{If "stayed the same or don't know" was selected, go to PB5}:

(B) By what percentage?

Part (A)	Part (B)	
☐ Increase	☐ Less than 10%	☐ 21 to 50%
☐ Decrease	☐ 10 to 20%	☐ 51 to 100%
☐ Stay the same		% _____ Other
☐ Don't Know		

- PB5.** (A) In the year 2000, for which of the following applications did you use Particleboard?
(B) What percentage of your total use by volume of Particleboard was used in each application?

	Part (A)	Part (B)	
Components in manufacturing	☐ Yes ☐ No	_____ %	← If YES go to PB6 otherwise go to PB7
Jigs & Pattern	☐ Yes ☐ No	_____ %	
Packaging or Crating	☐ Yes ☐ No	_____ %	
Other _____	☐ Yes ☐ No	_____ %	
Total		100 %	

- PB6.** Please tell me what percentage of your Particleboard used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

- PB7.** (A) Have you ever substituted another raw material for Particleboard?

☐ Yes → Go to (B)
☐ No

- (B) Please name the raw material for which Particleboard was replaced and tell me why?

- PB8.** (A) Have you ever substituted Particleboard for another raw material?

☐ Yes → Go to (B)
☐ No

- (B) Please name the raw material for which Particleboard was substituted and tell me why you made the substitution.

MEDIUM DENSITY FIBERBOARD (MDF)

MDF1. What was the total volume of Medium Density Fiberboard (MDF) your plant used in the year 2000*?

*Measuring Units	
1.	_____ Square Feet (ask for thickness)
2.	_____ Square Meters (ask for thickness)
3.	_____ Carloads
4.	_____ Truckloads
5.	_____ Units/Bundles/Lifts
6.	_____ Other (_____)
7.	_____ Don't know/no response

MDF2. Roughly how much did you pay for the volume of MDF you used in the year 2000?

\$U.S. _____

MDF3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?

{If "stayed the same or don't know" was selected, go to MDF4}

(B) By what percentage?

Part (A)

☐ Increased

☐ Decreased

☐ Stayed the same

☐ Don't Know

Part (B)

☐ Less than 10%

☐ 10 to 20%

☐ 21 to 50%

☐ 51 to 100%

% _____ Other

MDF4. (A) Do you predict that your consumption of MDF will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?

{If "stayed the same or don't know" was selected, go to MDF5}

(B) By what percentage?

Part (A)

☐ Increase

☐ Decrease

☐ Stay the same

☐ Don't Know

Part (B)

☐ Less than 10%

☐ 10 to 20%

☐ 21 to 50%

☐ 51 to 100%

% _____ Other

MDF5. (A) In the year 2000, for which of the following applications did you use MDF?

(B) What percentage of your total use by volume of MDF was used in each application?

	Part (A)		Part (B)	
Components in manufacturing	☐ Yes	☐ No	_____ %	← If YES go to MDF6 otherwise go to MDF7
Jigs & Pattern	☐ Yes	☐ No	_____ %	
Packaging or Crating	☐ Yes	☐ No	_____ %	
Other _____	☐ Yes	☐ No	_____ %	
Total _____			100 %	

MDF6. Please tell me what percentage of your MDF used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

MDF7. (A) Have you ever substituted another raw material for MDF?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which MDF was replaced and tell me why?

MDF8. (A) Have you ever substituted MDF for another raw material?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which MDF was substituted and tell me why you made the substitution.

HARDBOARD

HB1. What was the total volume of Hardboard your plant used in the year 2000*?

*Measuring Units	
1. _____	Square Feet (ask for thickness)
2. _____	Square Meters (ask for thickness)
3. _____	Carloads
4. _____	Truckloads
5. _____	Units/Bundles/Lifts
6. _____	Other (_____)
7. _____	Don't know/no response

HB2. Roughly how much did you pay for the volume of Hardboard you used in the year 2000?

\$U.S. _____

HB3. (A) In general, has that volume significantly increased, decreased or stayed the same when comparing the year 2000 to the past three years?

{If "stayed the same or don't know" was selected, go to HB4}

(B) By what percentage?

Part (A)		Part (B)	
☐ Increased	→	☐ Less than 10%	☐ 21 to 50%
☐ Decreased		☐ 10 to 20%	☐ 51 to 100%
☐ Stayed the same			
☐ Don't Know			

% _____ Other

HB4. (A) Do you predict that your consumption of Hardboard will significantly increase, decrease or stay the same by the year 2003 as compared to 2000?

{If "stayed the same or don't know" was selected, go to HB5}

(B) By what percentage?

Part (A)		Part (B)	
☐ Increase	→	☐ Less than 10%	☐ 21 to 50%
☐ Decrease		☐ 10 to 20%	☐ 51 to 100%
☐ Stay the same			
☐ Don't Know			

% _____ Other

HB5. (A) In the year 2000, for which of the following applications did you use Hardboard?

(B) What percentage of your total use by volume of Hardboard was used in each application?

	Part (A)		Part (B)	
Components in manufacturing	☐ Yes	☐ No	_____ %	← If YES go to HB6 otherwise go to HB7
Jigs & Pattern	☐ Yes	☐ No	_____ %	
Packaging or Crating	☐ Yes	☐ No	_____ %	
Other _____	☐ Yes	☐ No	_____ %	
Total _____			100 %	

HB6. Please tell me what percentage of your Hardboard used in “components in manufacturing” go into applications where appearances do matter?

_____ % Appearances matter

HB7. (A) Have you ever substituted another raw material for Hardboard?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which Hardboard was replaced and tell me why?

HB8. (A) Have you ever substituted Hardboard for another raw material?

☐ Yes → Go to (B)
☐ No

(B) Please name the raw material for which Hardboard was substituted and tell me why you made the substitution.

COMPANY INFORMATION

1-a. Have your customers asked you to supply products that contain only “green certified” or environmentally certified” wood.

- ☐ Yes
☐ No

1-b. If Yes, have you actually supplied customers with products containing green certified wood?

- ☐ Yes
☐ No

1-c. If so, about how many orders in the past year? _____. And, what percentage of your business was this in the year 2000? _____%

2. How important are the following lumber/panel attributes to your purchasing decisions? [Please rate from 1 to 10, with 1 being not at all important and 10 being extremely important].

	Not important at all ←————→ Extremely Important									
Species type	1	2	3	4	5	6	7	8	9	10
Strength	1	2	3	4	5	6	7	8	9	10
Price	1	2	3	4	5	6	7	8	9	10
Visual characteristics	1	2	3	4	5	6	7	8	9	10
Ease of Machining	1	2	3	4	5	6	7	8	9	10

Now I would like to ask you some specific questions about your own plant.

3. How many years has your company been in business? # _____ Years

{OR}

Please choose from one of the following range categories that best estimates the number of years your company has been in business.

- ☐ Less than 10 years
☐ 10 to 20 years
☐ 21 to 50 years
☐ Over 51 years

4. What was your company’s total sales volume in U.S. dollars for the year 2000? \$ _____

{OR}

Please choose from one of the following range categories that best describe your total sales.

- ☐ Less than \$1 million
☐ \$1 million to \$9.9 million
☐ \$10 million to 49.9 million
☐ Over \$50 million

5. Could you please tell me how many people are currently employed in your company?

{OR}

Please choose from one of the following range categories that best approximate your company’s total number of employees.

- ☐ Under 20 people
☐ 20 to 50 people
☐ 51 to 100 people
☐ Over 100 people

PARTICIPATING ORGANIZATIONS

APA - *The Engineered Wood Association*

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Tacoma, Washington 98411-0700
(253) 565-6600

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99 Bank Street, Suite 400
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Forintek Canada Corporation

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Canada

Southern Forest Products Association

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Kenner, Louisiana 70064-1700
(504) 443-4464

Western Wood Products Association

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U. S. Forest Service

Forestry Sciences Laboratory
USDA Forest Service
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Princeton, WV 24740
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