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The Mississippi furniture industry and its use of wood-based materials

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and Its Use of Wood-based Materials

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Introduction

Furniture manufacturing is one of the most important industries in Mississippi; the industry's phenomenal growth and current high levels of production and employment have recently been widely recognized and publicized. The Mississippi Economic Council (1988), for example, recently labeled the state "The New Furniture Capital of America," and Northeast Mississippi was recently described as a "booming region" that "wants to be the Furniture Capital of America" (Evans 1987). The present report characterizes important aspects of Mississippi's furniture industry, including its development and relative importance within the state and within the U.S., and assesses current information on the availability and use of wood-based raw materials. The report has major sections on **The Mississippi Furniture Industry** and **Use of Wood-Based Materials,** with a **Discussion** section summarizing the current outlook for furniture production and demand.

The Mississippi Furniture Industry

Furniture manufacturing has been an important industry in the United States since colonial times. Production has generally been concentrated in specific geographic areas of the country–areas with plentiful wood raw materials and with relatively low costs of transportation to population centers. Jamestown, New York, Grand Rapids, Michigan, and High Point, North Carolina, are the most prominent historical centers of U.S. furniture production. In recent years, however, the U.S. furniture industry has been influenced by population shifts to California, Texas, and Florida. Market centers have developed in Atlanta, Dallas, Los Angeles, San Francisco, and Seattle, although the important market at High Point has maintained North Carolina's national leadership (Wisdom and Wisdom 1983).

Due to recent growth of the upholstered furniture industry, Mississippi is also nationally prominent in furniture manufacturing and marketing. The following sections describe the **Development of Mississippi's Furniture Industry**, the **Current Importance of Furniture Manufacturing in Mississippi**, and its importance in a **Regional and National Context.**

Development of Mississippi's Furniture Industry

In the 1950's and early 1960's, the furniture industry was just becoming a major industry in the state. The 1963 *Census of Manufactures* listed 82 furniture establishments in the state, with a total of 7,000 employees. Since the mid-1960's, the industry has grown significantly. In 1987, the Mississippi Employment Security Commission listed more than 22,000 furniture industry employees in the state. More detail on the present importance of the industry is presented in the next section.

What type of furniture industry has developed in Mississippi, and why has the growth occurred?

The word "furniture" encompasses many products–furniture types and styles that could be classified in several ways. The U.S. Department of Commerce (USDC) Bureau of the Census classifies "furniture and fixtures"[1] by type of use (household, office, etc.) and

[1]Although conventions vary between countries, in the U.S., furniture is distinguished from fixtures–"furniture is movable and fixtures are attached to a wall or floor" (U.S. Department of Commerce 1985).

by the types of materials used in manufacture (wood, metal, etc.). In describing the type of furniture industry that has developed in Mississippi, this report uses the Standard Industrial Classification (SIC) codes. SIC 25, "Furniture and Fixtures," includes 13 sub-categories (listed in Appendix A). Mississippi furniture manufacturing is primarily household furniture (SIC 251), which includes classifications for wood, non-upholstered (SIC 2511) and wood, upholstered (SIC 2512) styles. Appendix A lists the specific types of furniture included in the "Household Furniture" classification.

Figure 1. Mississippi furniture industry employment and relative geographic location (from the Mississippi Employment Securities Commission.)

Unless stated otherwise, the text and figures in the present report are for SIC 25 and do **not** include firms primarily manufacturing wood frames, squares, and turnings for furniture. The *Census of Manufactures* groups such firms with flooring and other hardwood products as Hardwood Dimension[2] and Flooring Mills, SIC 2426. Also, where text and figures refer specifically to upholstered furniture, the data do **not** include "dual purpose sleep furniture, such as studio couches, sofa beds, and chair beds." The *Census* classifies such firms under SIC 2515, Mattresses and Bedsprings, regardless of materials used in the frame.

Figure 1 illustrates the extent of furniture industry growth in Mississippi, as well as the industry's relative location within the state. Most of the state's furniture production and employment are in the northeastern counties—counties where upholstered, wood household furniture production has become concentrated. Eleven counties accounted for nearly 75 percent of the 22,500 furniture industry employees in Mississippi in 1987.

Furniture manufacturing has also grown relative to other types of manufacturing in the state (Figure 1). In 1987, 10 percent of the state's manufacturing workers were employed in furniture production, up from just over 5 percent in 1963.

The Mississippi furniture industry has grown in total production and employment, as well as in relation to other manufacturing industries. **The Futorian Legacy** (see page 3) and two reports from the 1960's address the question of "**Why** has the growth occurred?" A 1963 report from the Tennessee Valley Authority (TVA), *Furniture Industry Expansion in the Tennessee Valley*, describes regional growth of the industry following World War II, and summarizes factors that would influence further development of the industry. Although only four of the 125 counties considered in the TVA report are in Mississippi, the factors identified as conducive for furniture industry expansion apply to all northeastern counties of the state.

The report stressed the Tennessee Valley's plentiful raw materials and labor, and the area's ideal location in relation to markets. Timber resources, wood and textile raw materials availability, and production factors such as fuel, power, and financing were described as "unusually favorable" for furniture industry

[2]When applied to hardwood products, the term dimension refers to "material that has been cut to size for furniture or pallet manufacture" (Haygreen and Bowyer 1987). When applied to softwoods, however, dimension is lumber that is 2 to 4 inches thick.

growth. Labor was described as generally available, productive, and readily trainable. The TVA report also stressed the area's history of working with timber and wood products:

". . . .the people of the Valley have had a long history of working with trees and wood products. This heritage is still much in evidence and is reflected by a basic understanding of, and a natural liking for, wood-based industries."

Whether or not a "natural liking" for wood-based industries existed, clearly an important factor in furniture industry expansion in the Tennessee Valley in the last 20 years has been the area's "favorable distribution position." Furniture is a relatively bulky product and the region's highway and railway networks have allowed relatively rapid, low-cost delivery to major eastern and midwestern U.S. markets.

In Mississippi, there are many reasons why the furniture industry has expanded—some of the reasons are reflected by the 1963 TVA report. A more complete outlook for potential growth of the industry in Mississippi, however, was prepared in 1966 by the Mississippi Research and Development Center. The report, *Mississippi's Advantages for the Manufacture of Upholstered Wood Furniture*, emphasized the state's potential for growth in producing the type of furniture for which the state has become nationally prominent. The first sentence of the report's summary says "Mississippi has the most profitable climate in the United States for the manufacture of upholstered furniture." The R & D Center concluded that the state

A Futorian Legacy

Mississippi's furniture industry is heavily oriented toward upholstered furniture. The origin and phenomenal growth of the industry, as well as its orientation toward upholstered furniture, has largely been attributed to the foresight and innovation of a Russian immigrant named Morris Futorian.

Futorian, an Illinois businessman, is considered by many to be the "granddaddy" of the Mississippi upholstered furniture manufacturing industry. He started his career in the upholstery trade in the early 1920's, shortly after his family immigrated from Russia to Chicago. He envisioned a new concept of upholstered furniture manufacturing, moving from the traditional method of individual craftsmen building each furniture piece to an assembly line with many craftsmen mass producing high-styled merchandise at mass market prices. Futorian needed a location to introduce his new concept, and in September 1948, he moved his custom upholstery operation from Chicago to New Albany, MS.

The townspeople of New Albany raised $185,000 on two bond issues to build the 55,000 square foot plant, which Futorian named Stratford after the street on which he lived in Chicago. He brought with him two employees—an upholstery specialist and a cabinetmaker skilled in woodworking and frame assembly. He obtained a labor force from the local depressed farm community and described it as having the "right attitude," being straightforward, honest, and hospitable. They were proud craftsmen, carefully trained to his methods of mass producing high quality upholstered furniture.

To develop his concept of mass producing upholstered furniture, Morris Futorian trained young people to a high level of proficiency in a specific work segment of the manufacturing process. He instilled in his workers a sense of pride in their work habits and carefully trained them in his particular methods. He believed in a mobile work force and moved his people up through the ranks, a practice that developed northeast Mississippi's large pool of trained furniture laborers. Many of these former workers now manage or own their own companies.

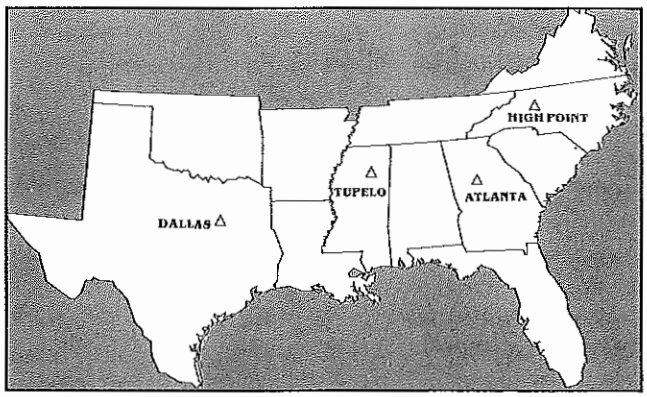
The people trained in Futorian's methodology have been referred to as graduates of the "University of Futorian."

The list of apprentices is very impressive. Alvin E. Bland and Wilbert E. Holliman of Action Industries are considered by many the most successful spinoffs from the Futorian Corporation. Jim Muffi of PeopLoungers, a second generation of Futorian graduates, was a former vice president of marketing for Action Industries. These are only three of numerous Futorian trainees who have made a significant contribution to the upholstered furniture industry in Mississippi.

These Futorian-trained entrepreneurs and those still to come have many advantages over others trying to enter the upholstered furniture manufacturing industry; they are skilled at the many diverse aspects of the manufacturing process. With the purchase or lease of a building, a few pieces of equipment, and the raw materials, a graduate of the "University of Futorian" is prepared to go into business.

had the most profitable climate after reviewing "eight major advantages," of Mississippi over other states:

(1) Mississippi already had an established and "successful" furniture industry in the mid-1960's.
(2) Labor productivity was determined to be high. Based on the 1963 *Census of Manufactures,* Mississippi had the second highest "value added to raw material per dollar of wages paid."
(3) The R & D Center reported that labor was available in quantity and quality. Low incomes in the state were interpreted to reflect nnderemployment; labor quality was discussed in (2), and was also discussed with respect to state-sponsored labor training programs.
(4) The labor climate in Mississippi in the mid-1960's was described as "among the best in the nation." Bureau of Labor Statistics reports were used to compare percentages of production time lost to labor strikes.
(5) Timber resources and processing facilities for wood raw materials were characterized as favorable for expansion. Another important raw material, polyurethane foam, was being produced in the state.
(6) Construction costs were described as lower in Mississippi than in other states (based on F. W. Dodge reports).
(7) Municipal bond financing was available for industrial equipment and building construction; interest rates on the bonds were low, approximately 4 percent, and building and equipment amortization costs were therefore relatively low.
(8) Finally, new manufacturing operations in Mississippi were entitled to request 10-year exemptions from city and county ad valorem taxes; buildings financed through the bond program referred to in (7) were not subject to real estate taxes while owned by the city or local governing authority.



Because it is centrally located, Tupelo and the surrounding area of Mississippi, has strategic advantages over other major furniture markets in the South.

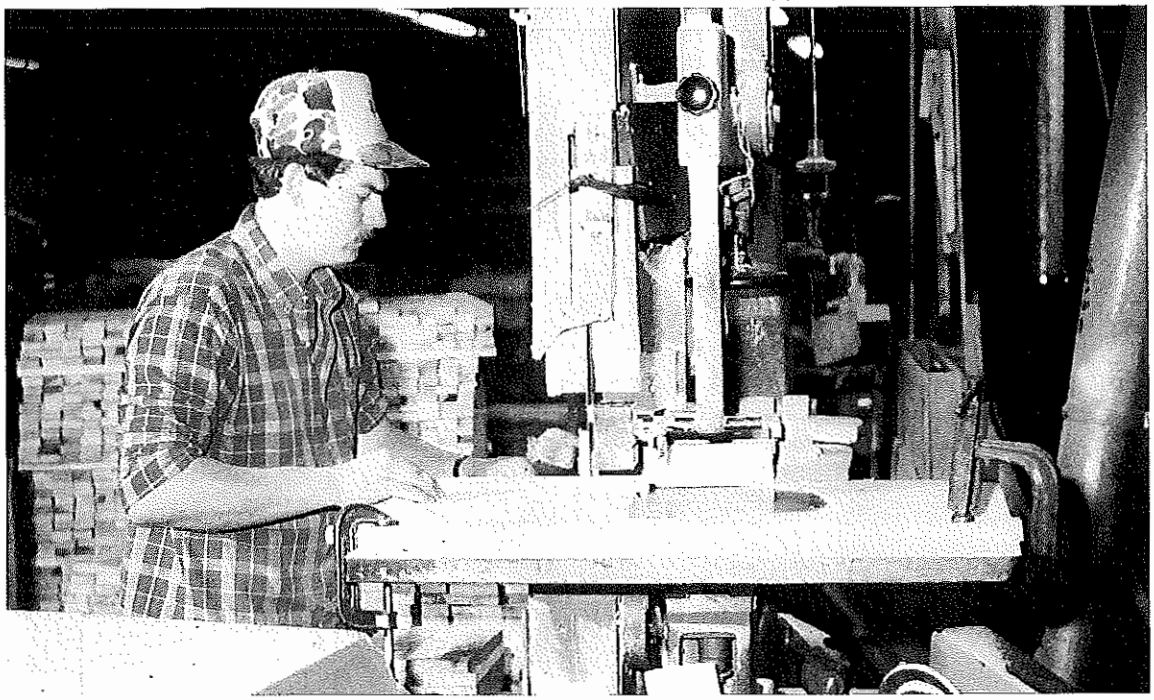
In addition to the important advantages Mississippi has had in the availability of inputs and low manufacturing costs, a key to the furniture industry's success has been the concentration of highly trained management and labor teams of entrepreneurial second- and third-generation companies. Trained in the style of production and management techniques and innovations introduced by Morris Futorian in 1948, the expertise of these management and labor teams has been a primary force behind the growth in upholstered furniture manufacturing in the state. This is especially true of "motion" furniture technology—more than half of the nation's major motion furniture manufacturers are located in Mississippi.

The Mississippi furniture industry has grown rapidly, yet the growth has been no surprise to those familiar with the state's manufacturing and business conditions during the last several decades. Laud, labor, and capital and management resources have been available, established firms have been successful (encouraging expansion), and distribution avenues and markets have been favorable compared to other areas of the U.S. and compared to other manufacturing industries.

The Current Importance of Furniture Manufacturing

The furniture industry in Mississippi continues to grow. Between 1972 and 1985, the value of shipments of the state's furniture industry increased 300 percent to just over $1 billion (USDC Bureau of the Census 1987a). Most of the growth in the Mississippi furniture industry has occurred in recent years; current employment of over 22,000 is an increase of 60 percent in the last 5 years. In 1986 alone, there were 11 new furniture manufacturers in the state and 39 existing firms were expanded. The furniture industry added over 2,500 manufacturing jobs in Mississippi in fiscal 1986 (adapted from the *Mississippi Statistical Abstract,* Coleman and Bryant 1987). Statewide, the industry now accounts for 10 percent of all manufacturing employment, and personal income directly from furniture manufacturing accounts for 3.4 percent of all personal income in the state (Mississippi R & D Center 1986).

In terms of employment and wages, the furniture industry is one of the most important manufacturing industries in Mississippi. Among broad types of manufacturing in the state in 1985, furniture ranked sixth in employment and wages (Table 1). The industry ranked sixth even though the employment and wages of hardwood dimension and furniture parts manufacturers were not included—in the Standard Industrial Classification, such producers are included



"The Mississippi furniture industry has grown rapidly, yet the growth has been no surprise to those familiar with the state's manufacturing and business conditions during the last several decades."

Table 1.A representative comparison of employment and wages for important manufacturing industries in Mississippi. Industries are listed in decreasing order of total wages in the last 3 months of 1985.

	(SIC) Industry	Employment* December 1985	Total Wages* Fourth Quarter 1985
1.	(36) Electrical Equipment, Supplies	23,422	$116 million
2.	(37) Transportation Equipment	20,909	$111 million
3.	(23) Apparel, Other Textiles	36,780	$ 97 million
4.	(24) Lumber and Wood Products	22,854	$ 92 million**
5.	(20) Food, Kindred Products	23,007	$ 83 million
6.	**(25) Furniture, Fixtures**	**20,339**	**$ 76 million****
7.	(35) Machinery, Except Electrical	12,527	$ 63 million
8.	(34) Fabricated Metal Products	12,499	$ 59 million
9.	(26) Paper, Allied Products	7,475	$ 52 million
10.	(30) Rubber and Plastics	9,380	$ 41 million
11.	(28) Chemicals, etc.	6,325	$ 40 million
12.	(27) Printing, Publishing	6,751	$ 30 million
13.	(32) Stone, Clay, Glass	5,644	$ 27 million
14.	(22) Textile Mill Products	6,134	$ 24 million
15.	(33) Primary Metal Products	3,986	$ 21 million
16.	(29) Petroleum, Coal Products	2,108	$ 17 million
17.	(39) Miscellaneous Manufacturing	3,678	$ 15 million
	TOTALS	223,818	$964 million

*Adapted from Table 6.1, *Mississippi Statistical Abstract 1987,* (Coleman and Bryant 1987). From the Census Bureau's *Annual Survey of Manufactures, 1985,* very similar industry rankings result for criteria such as value of shipments and value added by manufacture; much of the industry-specific data for new capital expenditures was not disclosed, however.

**SIC 25, Furniture and Fixtures, does not include firms primarily manufacturing wood frames, squares, and turnings for furniture; such firms are included in SIC 24, Lumber and Wood Products. The *Mississippi Manufacturers Directory 1988* (Mississippi Research and Development Center 1988) has 33 firms with 2,307 employees listed as hardwood dimension and furniture parts manufacturers.

with lumber and wood products (SIC 24). The 1988 *Mississippi Manufacturers Directory* (Mississippi R & D Center 1988) lists 33 firms with wood furniture frames, hardwood dimension, and wood furniture parts as their only products of manufacturing. If the firms' 2,307 employees are counted as furniture industry employees, the industry would be very close to being the state's second largest manufacturing employer. Adding the payroll to furniture industry wages would place the industry fourth in the state.

The furniture industry's importance relative to other manufacturing in Mississippi is also evident from recent "location quotients" for various industries. Location quotients (LQs) are obtained by:

$$LQ_i = \frac{\%\text{ State or Regional Employment in Industry i}}{\%\text{ U.S. Employment in Industry i}}$$

Such quotients or ratios are often used to distinguish "basic" industries in a state or region from "nonbasic" industries; Mississippi has an LQ of 4 for furniture and fixtures, indicating that the industry is 4 "times more important" to Mississippi "than it is to the nation" (Hodes et al. 1988). Only two other manufacturing industries in Mississippi have LQs above 1; the apparel industry and the lumber and wood products industry in Mississippi both have LQs of 3 (Hodes et al. 1988). Again, it should be noted that relative employment in the furniture and fixtures industry in the state is understated by including wood furniture frame and parts manufacturers with lumber and wood products, rather than with furniture.

Direct output, income, and employment increases are not the only benefits from growth in furniture manufacturing in Mississippi. A recent input-output model for the state reported multipliers for various industries—each dollar of additional furniture industry output generates an estimated $2.27 in statewide output, each dollar of additional income from furniture production generates an estimated $1.73 in income statewide, and each furniture manufacturing job results in about 1.8 total jobs in the state's economy (Type II output, income, and employment multipliers from Lee 1986).

The growth in production and employment in furniture in Mississippi has primarily been upholstered, wood household furniture. Upholstered furniture accounted for about half of the industry's production and employment in 1982; today it accounts for over 70 percent. Figure 2 shows the relative locations of upholstered, wood household furniture firms in the state. An excellent review of the development and importance of the npholstered, wood household furniture industry in Mississippi is provided by Garth (1988); the entire May 1988 issue of *Upholstery Manufacturing* is a special report titled "The Upholstered State of Mississippi."

Employment and output in any industry is underestimated if related industries and economic multipliers are not considered. The upholstered furniture industry has attracted many "suppliers" to the state, and total employment and income for the industry have been reported as high as 60,000 jobs and $1 billion in "net economic impact" (Mullen 1988).

Mississippi has been particularly successful in attracting new upholstered wood furniture plants that are affiliated with large, out-of-state companies. In 1986, there were 79 companies producing upholstered, wood household furniture in Mississippi and 34 of them had more than one establishment in the state. Of the 34 multi-establishment upholstered furniture firms, only 7 listed their Mississippi operations as company headquarters (from the 1987 *Mississippi Manufacturers Directory*, Mississippi R&D Center 1987).

Regional and National Context

Is Mississippi becoming "The New Furniture Capital of America?" Currently, the answer may be yes for a specific type of furniture—the state may currently lead the nation in production of medium-priced, upholstered, wood household furniture.[3]

The preceding statement has four qualifiers, and it might at first appear trivial to potentially lead the nation in such a specific subcategory of furniture. The statement is not trivial, however, because medium-priced, upholstered, wood household furniture comprises a very high percentage of all furniture produced and sold in the United States. Such furniture is prevalent in most American homes.

The Mississippi Economic Council (1987) has stated that "Mississippi can become the furniture capital of America by the year 1990." This statement of potential for unqualified leadership in furniture production was made after reviewing the state's location with respect to Atlanta and Dallas markets, and the relative availability of raw materials and labor:

"These factors helped Mississippi in 1986 to surpass North Carolina in the total number of upholstered

[3]Mississippi's value of shipments for upholstered, wood household furniture (SIC 2512) was just over $1 billion in 1985 (USDC Bureau of the Census 1987)—almost 25 percent of the estimated U.S. total value of shipments in that category. The U.S. Department of Commerce (1988) reported the U.S. total for 1985 as $4.3 billion; Mississippi's production would represent a high percentage of the medium-priced upholstered, wood household furniture, and would also currently be higher due to growth since 1985. Mississippi's industry is also highly oriented toward motion furniture—recliners and other furniture with action mechanisms.

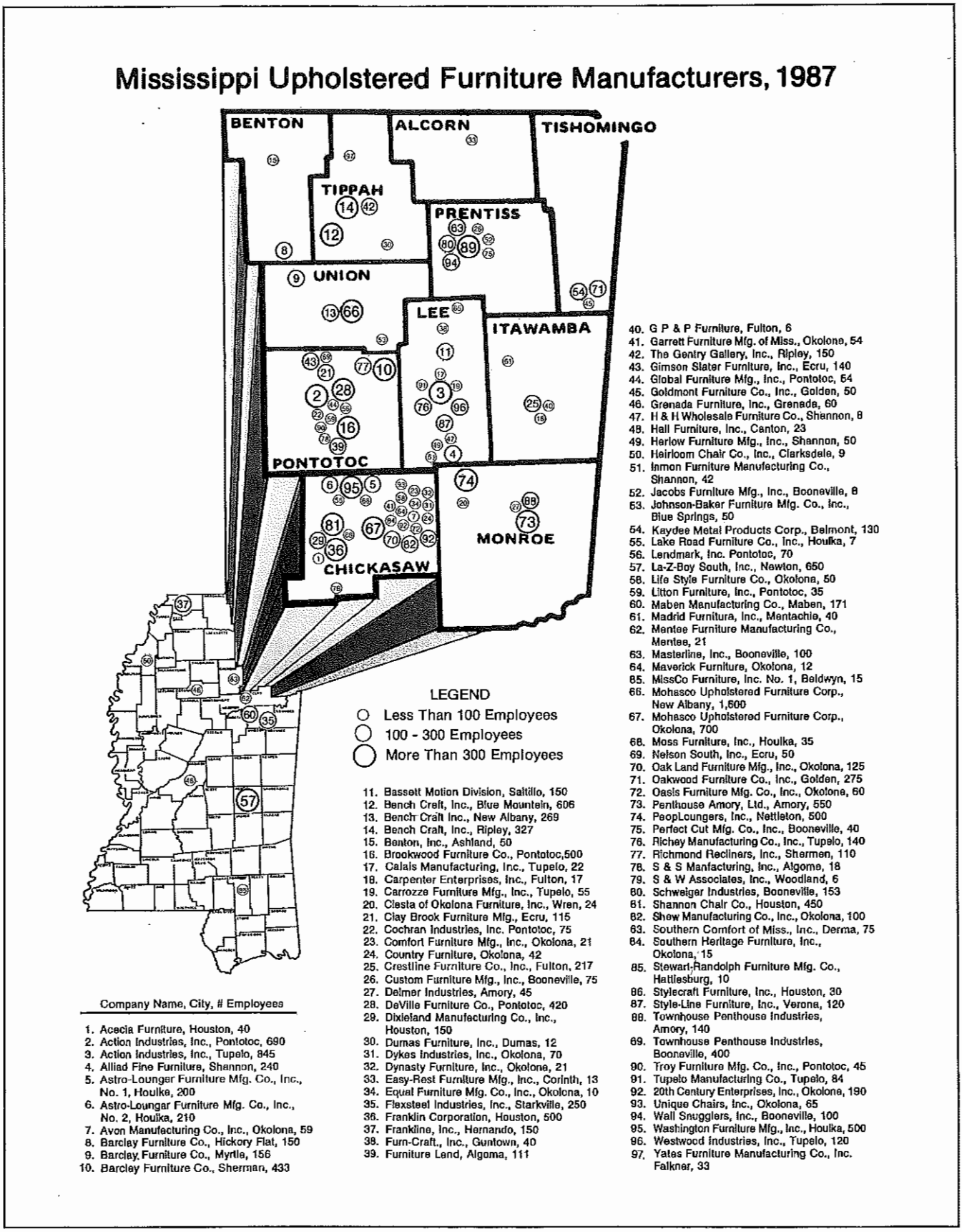
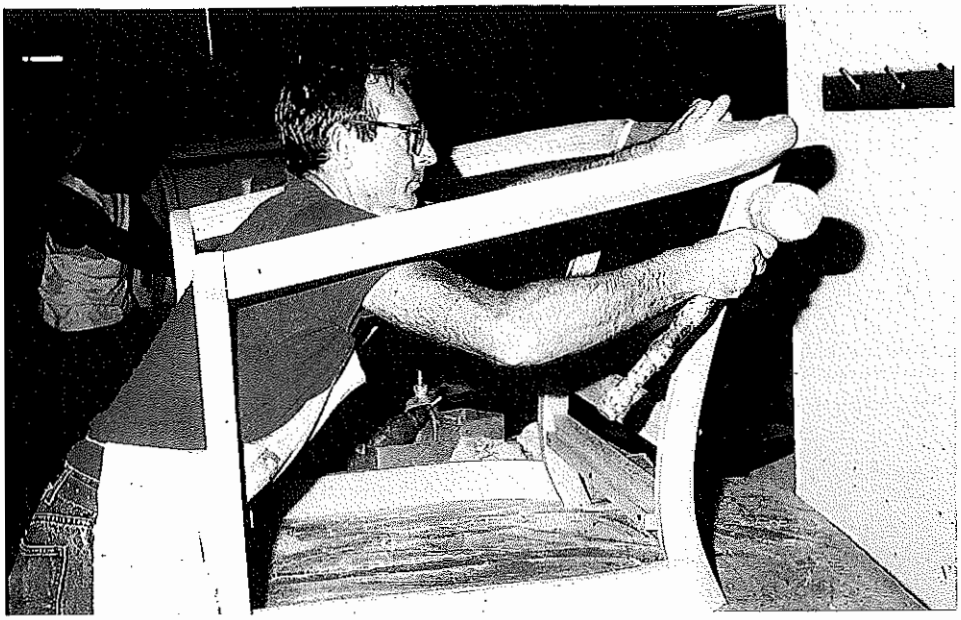


Figure 2. Upholstered, wood household furniture firms (SIC 2512) listed in the *Mississippi Manufacturers Directory* (Mississippi R & D Center, 1988).



Mississippi may currently lead the nation in producing medium-priced, upholstered, wood household furniture—a category of furniture representing a high percentage of all furniture produced and sold in the United States.

pieces produced. And, the R & D Center reports that Mississippi has moved within striking distance of North Carolina in the total volume of sales.

"According to figures from the U.S. Census Bureau, Mississippi in 1983 trailed North Carolina by over $2 billion in furniture and fixtures sales. By 1986, this gap had narrowed to $63 million."[4]

State-to-state comparisons of current furniture production and employment are difficult because of problems in the reliability, comparability, and timeliness of secondary data. The 1987 *Census of Manufactures,* for example, has not yet been compiled and published; the 1982 *Census* reflected recession-year manufacturing conditions, and would obviously not reflect the most recent growth of the furniture industry in Mississippi. An important characteristic of Mississippi's industry is evident, however, from data in *County Business Patterns, 1985* (USDC Bureau of the Census 1987b)—Mississippi producers of upholstered, wood household furniture generally have larger-scale production facilities than competitors in other states. Almost half of the 1,136 establishments producing such furniture in the U.S. in 1985 had fewer than 20 employees; in Mississippi, less than 30 percent of the establishments had fewer than 20 employees. Only 18 of the upholstered, wood household furniture plants in the U.S. had more than 500 employees in 1985; five of the extremely large plants were in Mississippi, six were in North Carolina, and three were in Tennessee. According to the 1988 *Mississippi Manufacturers Directory* (Mississippi R & D Center 1988), 11 of the upholstered furniture plants in the state currently have 500 or more employees.[5]

The relative size of Mississippi furniture establishments is also evident comparing total numbers of establishments and employees in the industry. Mississippi had 7 percent of the U.S. establishments producing upholstered, wood household furniture in 1985, but the state had 14 percent of total U.S. employment in the industry (USDC Bureau of the Census 1987b). In contrast, California had 17 percent of the establishments in the U.S., but fewer than 10 percent of the employees. Tennessee had about the same number of SIC 2512 establishments as Mississippi in 1985, but Mississippi had 57 percent more employees. Mississippi also has a high percentage of firms with more than one establishment. The 1982 *Census of Manufactures* lists 43 percent of Mississippi's upholstered, wood household manufacturers as multi-plant firms. Nationwide, fewer than 10 percent of such firms have more than one manufacturing facility.

[4]The March 7, 1988, issue of *Furniture Today* is a special report on the "Mississippi mecca" of furniture manufacturing and marketing. The issue has manufacturing subsections titled "Top Producers Hear Mississippi's Call," "Influx of Companies, Capital Marks Region," and "Friendly Business Climate Gives Upholstery Makers Competitive Edge" (Shaver 1988). Shaver states, however, that although "Mississippi's claim that it ships more upholstery than other states cannot be verified.... one need only review the major upholstery manufacturers who are either based here or who have large factories in Mississippi to see the volume of upholstery produced in this state is substantial."

[5]As shown in Figure 2, the 11 plants with 500 or more employees are Mohasco Furnitnre Corporation, New Albany (1,600 employees); Action Industries, Inc., Tupelo (845); Mohasco Furniture Corporation, Okolona (700); Action Industries, Inc., Pontotoc (690); La-Z-Boy South, Inc., Newton (650); Bench Craft Industries, Inc., Blue Mountain (606); Penthouse Amory, Ltd., Amory (550); and Brookwood Furniture Co., Pontotoc, Franklin Corporation, Houston, PeopLoungers, Inc., Nettleton, and Washington Furniture Mfg., Inc., Houlka (500 employees each).

Use of Wood-Based Materials

Wood-based materials are extremely important as inputs to furniture production, including the upholstered furniture which dominates Mississippi's production. Nationwide, furniture production is by far the largest industrial use of wood products. Figure 3 presents some of the common types of wood products and some of their major uses. The Figure highlights the importance of specific wood products used in U.S. furniture manufacturing. Furniture manufacturing accounts for a relatively small percentage of softwood lumber used in the U.S., but accounts for more than 25 percent of all hardwood lumber—a percentage that has been nearly constant for the last 30 years (Cardellichio and Binkley 1984). The following sections describe the **Advantages and Outlook for Wood** as a furniture raw material, the **Importance of Wood in Mississippi Furniture Manufacturing,** and **Mississippi's Hardwood Timber Resources.**

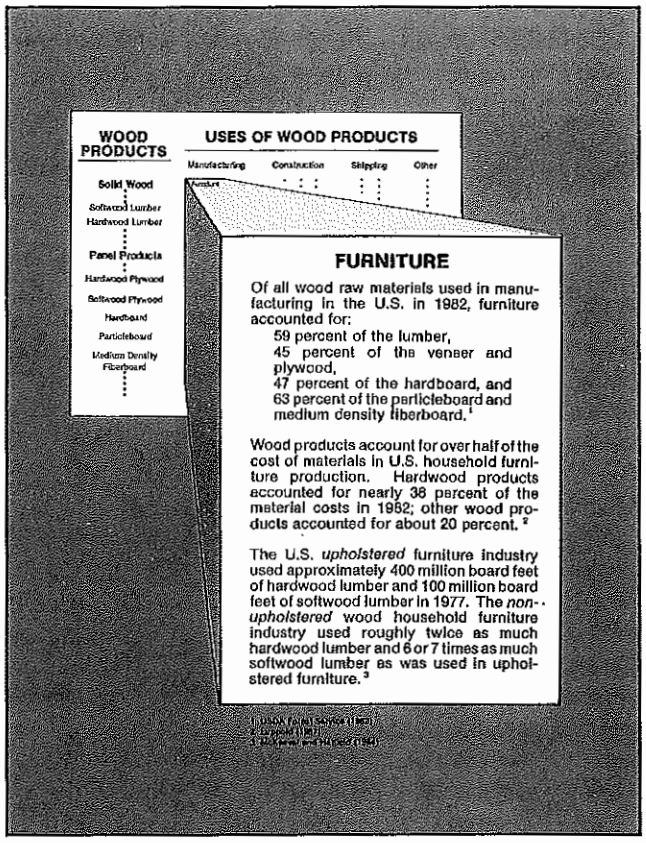


Figure 3. Wood use in furniture by type of wood product.

Advantages and Outlook for Wood

Wood has several advantages as an industrial raw material, and also has advantages specific to furniture manufacturing:

Advantages As An Industrial Raw Material
(from Haygreen and Bowyer 1987)

1. Forests and wood are renewable—quantities of wood can be assured with adequate investment in forest regeneration and management. Forests may also provide recreational, watershed, and wildlife benefits.

2. Wood materials can provide part of the energy necessary for manufacturing; certain forest products industries have the potential of becoming energy self-sufficient.

3. Wood is versatile. "It can be sawn for lumber, sliced for veneer, cut into particles, or broken down into fiber. The technological opportunities to serve human needs are accordingly great."

Advantages As A Furniture Raw Material

1. Manufacturers can substitute wood product types (veneer, solid wood, etc.) and species as relative product costs and consumer preferences change.

2. Furniture designs and styles change with time; the frequent retooling necessary in most furniture manufacturing requires a versatile, yet relatively low-cost material like wood (Kaiser and James 1969).

The outlook for wood use in U.S. manufacturing, including the U.S. furniture industry, is extremely favorable. The advantages listed above are not inherent to most industrial raw materials. Metals, plastics, and cements, for example, may become increasingly costly in the future as difficulties arise in the availability of their raw materials inputs, as energy costs of manufacturing increase, and as environmental problems in production must be addressed (Haygreen and Bowyer 1987).

Future levels of wood use in furniture manufacturing must be considered by **type** of furniture and by the intended market or **price range** of the furniture (Figure 4). In wood household furniture, changes in raw materials are most likely in the medium-priced furniture types and styles. Interchange is expected between wood and non-wood raw materials as well as between solid wood and composite wood products. Luppold (1987) and Ackerman (1987) have proposed the word "interchange" as more appropriate than "substitution" between materials because technology, consumer preferences, and many other supply and de-

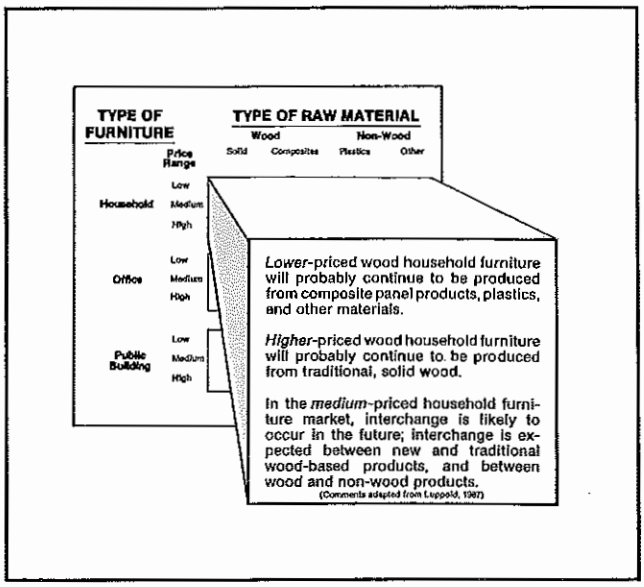


Figure 4. The outlook for wood use in furniture depends on the type of furniture and the price range considered.

mand factors result in greater use of traditional wood materials in some time periods than in others. Interchange is expected over time rather than continual substitution away from wood materials.

The total amount of wood used in furniture production in the United States has been relatively stable over the past several decades, but the wood used **per unit** of furniture has declined consistently (Cardellichio and Binkley 1984). Such trends led Cardellichio and Binkley to state that "furniture manufacturers have proven quite ingenious in their ability to find substitutes for hardwood lumber." They concluded, however, that hardwood lumber has not lost a significant share of furniture production to metals and plastics over the last 20 years, but "only to less expensive reconstituted wood products." As in the past, supply and demand factors will determine the future use of wood versus non-wood materials in furniture, as well as the use of solid wood versus composite wood products.

"Supply" factors include processes, techniques, government policies, or any factors that influence the costs of production. Perhaps the three most important supply-related factors in materials substitutions away from hardwood lumber and solid wood in U.S. furniture manufacturing have been technology, the physical availability of hardwood timber, and furniture production efficiencies possible from the use of alternatives to solid wood. Technology, for example, can affect the amount of lumber available for manufacturing. An example is the increased efficiency possible in sawmills and furniture rough mills through the use of computerized equipment (Cassens 1986). Technology can also reduce the amount of solid wood needed by the furniture industry; and new techniques, materials, or processes can lower the costs of using alternative products. Composite wood products are an example of such a technological advance; their use has lowered production costs and has freed manufacturers from the final product size limits formerly imposed by the sizes of available logs and lumber (Maloney 1979).

Another supply factor influencing materials substitutions in furniture is the availability of standing timber. Timber availability has greatly influenced the costs of hardwood lumber in the species and grades desired for specific types of furniture production. The cost of No. 1 Common red oak lumber, for example, increased at an average compound rate of 2.1 percent per year in real terms from 1948 to 1983 (Hoover 1984). Furniture manufacturers have continually adjusted for changes in the quality of timber resources; some adjustments have involved using other products and some have involved using other lumber species and sizes (Smith 1978). Since 1972, pine has been increasingly used in furniture production in the U.S., in part due to the increasing popularity of Early American and rustic styles of wood household furniture (demand factors), but also in large part due to the relatively low price of softwood lumber compared to hardwood lumber of furniture quality (Luppold 1987).

A third supply factor influencing materials substitutions in furniture has been production efficiencies. In some applications, wood products have been replaced by materials with lower labor needs or other production cost advantages. Wood is a versatile material, but the need for "endless refining processes" has meant relatively high labor costs in the past (Robinson 1965). Labor-saving techniques and processes (technologies) have greatly improved the production efficiencies of using lumber and other wood products, however. The Automated Lumber Processing System (McMillin et al. 1984) is an example of technology with promise for future labor cost reductions.

Past improvements in wood use in furniture manufacturing include wood carving machines with multiple cutting heads; direct dimensioning at sanding machines through abrasive planing; the refinement in design and use of portable, hand-held power fastening tools; and the development of labor-saving wood surfacing and finishing techniques (Henneberger 1978). "Flexible automation" is a goal of current research in U.S. furniture manufacturing. Automation will help improve productivity and reduce labor costs, an increasing concern with regard to foreign competition; antomation will only succeed in furniture manufacturing, however, if flexibility is maintained in meeting the production demands of new styles and designs (Anonymous 1988).

Cost or supply factors are not the only determinants of materials substitutions iu furniture production; consumer **demand** for furniture also directly influences the types and quantities of wood and other materials used. Demand factors influence the quantity of furniture that consumers are willing to buy at different prices. Furniture demand is influenced by the disposable income of consumers, the number of consumers, the affordability of new housing, and many other factors. An extremely important demand factor in the level of wood use in furniture is consumer **preference**—styles or types of furniture that are preferred by consumers vary over time and at different places. Preferences for specific woods have varied a great deal from time to time. Oak, for example, is currently very popular for household and other furniture in the U.S., yet the 1966 Mississippi R & D Center report on upholstered furniture shows that oak's popularity has varied with time:

"A new manufacturer might want to give some thought to the manufacture of oak furniture. Although this wood has been out of style for a long time, strong promotion has been making oak a popular wood again; a newcomer might be able to take advantage of the renewed interest."

"Strong promotion" is one way to influence product demand through consumer awareness and preferences. The Hardwood Manufacturers Association is currently promoting the use of solid wood in U.S. furniture and kitchen cabinets. The promotion extols the basic value and characteristics of solid hardwood furniture to consumers of furniture, and communicates the characteristics and lack of good substitutes to U.S. producers of household furniture (Hardwood Manufacturers Association 1988).

Availability of substitutes is an important factor in the demand for wood products. Although some material substitutions and changes in species mix have occurred due to increasing prices of wood products, Luppold (1983) provided empirical evidence of the relative necessity of wood in furniture production—estimated demand relationships for wood in U.S. household furniture production were relatively inelastic with respect to price changes. That is, producers were not highly responsive to price changes in the short term. Luppold did, however, find that furniture producer's demand for open-grain species of lumber was more responsive to price changes than demand for closed-grain species. Oaks and other open-grain species are used to a greater extent in what Luppold referred to as "casual and fashionable furniture;"

Unlike many raw materials, wood is renewable and can be used to generate energy; wood is a versatile, yet relatively low-cost raw material.

closed-grain species are often used in "traditional pieces and reproduction lines where species are substituted less often." Luppold also noted that although lumber prices do affect lumber usage in the wood household furniture industry, the time it takes for producers to react to changes in lumber prices makes the reaction difficult to observe.

Importance of Wood in Mississippi Furniture Manufacturing

Based on the *Census of Manufactures* "Value of Shipments," almost 90 percent of the furniture produced in Mississippi in 1982 was Household Furniture, SIC 251; nearly 80 percent of the value of shipments was Wood Household Furniture, SIC 2511 and SIC 2512. The upholstered, wood household furniture industry produced nearly seven times the value of shipments attributed to non-upholstered furniture in the state in 1982. Wood is obviously important in the manufacture of non-upholstered, wood household furniture. Because of the relative dependence on upholstered furniture in Mississippi's "wood" household furniture industry, however, the question is "How important is wood as a raw material in the manufacture of upholstered furniture?" A recent survey of furniture firms in 21 northeastern Mississippi counties reported nearly 30 percent of raw materials purchases were wood-related products (Mississippi R & D Center 1986). The survey estimate for wood-related purchases was nearly $150 million per year, second only to fabric purchases of $170 million.

As in other states, the wood-based materials used in manufacturing furniture in Mississippi vary with the type of furniture and the price range considered. The R & D Center survey of furniture firms in northeastern Mississippi counties primarily reflects the types of wood products used in medium-priced upholstered furniture. Of the $150 million in wood-related raw materials purchases, $73.8 million was for furniture frames, $28.1 million was for oak lumber, and $16.5 million was for plywood (Mississippi R & D Center 1986). The demand relationship for wood in furniture frames and structural, interior parts should be relatively inelastic or relatively unresponsive to price changes in the short term. Wood has few good substitutes in such uses and the cost of the wood is a relatively small part of the total cost of the finished product. The use of **solid** wood products in upholstered, wood household furniture, however, has generally not kept pace with increases in upholstered furniture production; demand for solid wood products in upholstered furniture has been affected by the increased use of softwood plywood and composite panel products, by improved construction techniques requiring less lumber per piece of furniture, and by recent trends toward smaller upholstered pieces of furniture (Luppold 1988).

There are many sources of wood products used in Mississippi furniture manufacturing. In general, wood products for furniture are obtained through: (1) wholesalers and distributors who buy products directly from primary producers; (2) dimension, parts, and frame manufacturers who pre-process wood raw materials, either independently or with the help of the furniture firm; (3) commission agents who are not employed by wholesalers or producers; (4) independent sawmills and other independent producers of wood products; and (5) sawmills and other primary wood processing facilities owned by furniture plants (Kaiser and James 1969). A study is currently underway through the Mississippi Forest Products Utilization Laboratory to estimate the volumes and values of wood and non-wood materials obtained from various sources for the state's upholstered and non-upholstered, wood household furniture manufacturers.

Mississippi has abundant timber resources, and there may be great potential to increase furniture manufacturers' use of wood from timber grown and processed within the state.

Mississippi's Hardwood Timber Resources

In a previous section, supply and demand influences were related to the quantities and types of wood used in furniture production. In this section, supply factors are summarized for Mississippi's hardwood timber resources and their present and potential role in meeting the wood raw materials needs of the state's furniture producers. Demand factors are not discussed separately in this section, since demand for hardwood timber is a **derived** demand–the quantities of timber or lumber that producers are willing to buy at different prices depends on substitutes and the many factors that determine final product characteristics and demand relationships (as mentioned in the section on "Advantages and Outlook for Wood" as a furniture raw material). In this section, physical timber resources and hardwood timber availability issues are discussed.

Physical Resources. Mississippi has abundant timber resources, as highlighted by timber statistics adapted from the USDA Forest Service report on the state's 1987 Forest Survey (Donner and Hines 1987):

Mississippi has almost 17 million acres of commercial forests—lands that are producing, or are capable of producing, at least 20 cubic feet of wood per acre per year. Commercial forests represent 56 percent of the state's total land area.

Hardwood forest types comprise 72 percent of Mississippi's commercial forest acreage; 21 percent of the state's forest land is classified as oak-pine, 32 percent is oak-hickory, 18 percent is oak-gum-cypress, and about 1 percent is in the elm-ash-cottonwood forest type.

Private nonindustrial owners have 67 percent of the state's oak-pine acreage, 79 percent of the oak-hickory acreage, and 72 percent of the other hardwood forest types.

Based on volume, the state's growing stock of "soft" hardwoods such as sweetgum, blackgum, yellow-poplar, cottonwood, and red maple is 73 percent in private nonindustrial ownership; "hard" hardwoods such as oaks, hickories, hard maple, and ash are 75 percent private nonindustrially owned.

Average annual sawtimber volume growth is about twice as high as removals for select[6] white/red oaks, other white/red oaks, hickory, sweetgum, and yellow-poplar. Growth is almost four times as high as removals for ash-walnut-black cherry. Similar growth-removal comparisons apply specifically to hardwood sawtimber volumes on private nonindustrial lands in Mississippi.

Standing volumes of hardwood sawtimber are presented for Mississippi for 1987 in Figures 5 and 6. The state has almost 17 billion board feet of oak sawtimber, with 36 percent in select white/red oaks. Less than 5 percent of the standing volume of oak sawtimber in the state is grade 1 of select species. Nearly 40 percent of all oak sawtimber in Mississippi is in grades 2 and 3 of non-select or "other" species such as post oak, southern red oak, and water-willow oaks.

[6]Select white oaks include "true" white oak, swamp white oak, Durand oak, swamp chestnut oak, and chinkapin oak. "Other" white oaks include post oak, overcut oak, and chestnut oak. Examples of "select" red oaks are cherrybark, Shumard, and northern red oak; "other" red oaks include southern red oak, scarlet oak, black oak, water oak, willow oak, and Nuttall oak.

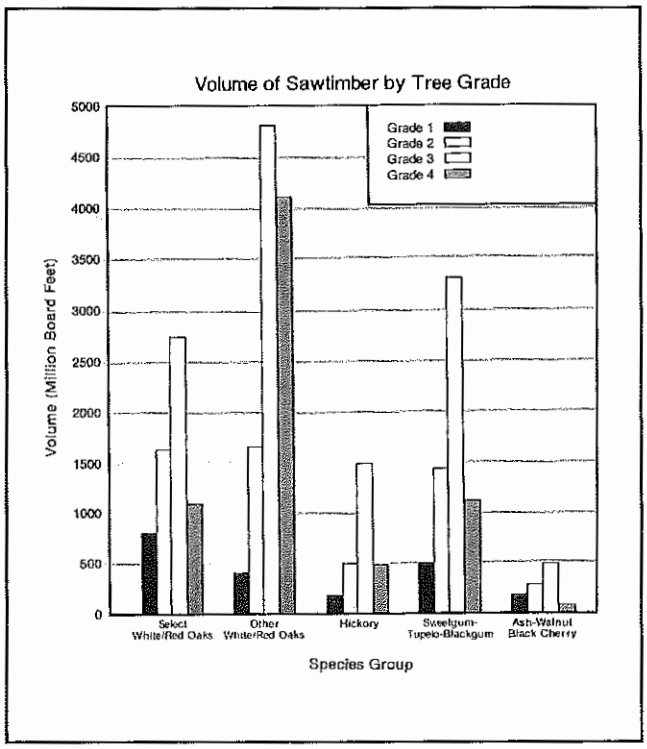


Figure 5. Hardwood sawtimber volume by species group and diameter class, Mississippi, 1987 (from USDA Forest Service, Donner and Hiues, 1987, Table 14.)

Timber Availability. Standing timber resources are one aspect of the supply of timber; they represent a physical upper bound on the quantity of timber that could be sold and processed in the short term in Mississippi. In the long run, of course, land use changes and other factors affect standing timber inventories. Standing volumes from the 1987 Forest Survey for Mississippi are an excellent point from which to consider hardwood timber availability issues–current ownership and site and stand attributes which effectively reduce the volumes of hardwood timber available for harvest in the next 5-10 years.

The need to consider availability issues for hardwoods has long been recognized. McClintock (1986), for example, described the issues with respect to the eastern U.S.:

"Annual growth of hardwoods is twice the cut. But consider the question of quality, and the seeming contradiction between forest survey reports that size and quality of hardwood timber are steadily improving, and the continuing lament of log buyers, veneer producers, and sawmill operators that just the reverse is happening. Here the hidden elements of availability and operability play a major role."

The "availability and operability" of Mississippi's hardwood timber resources are the focus of a study

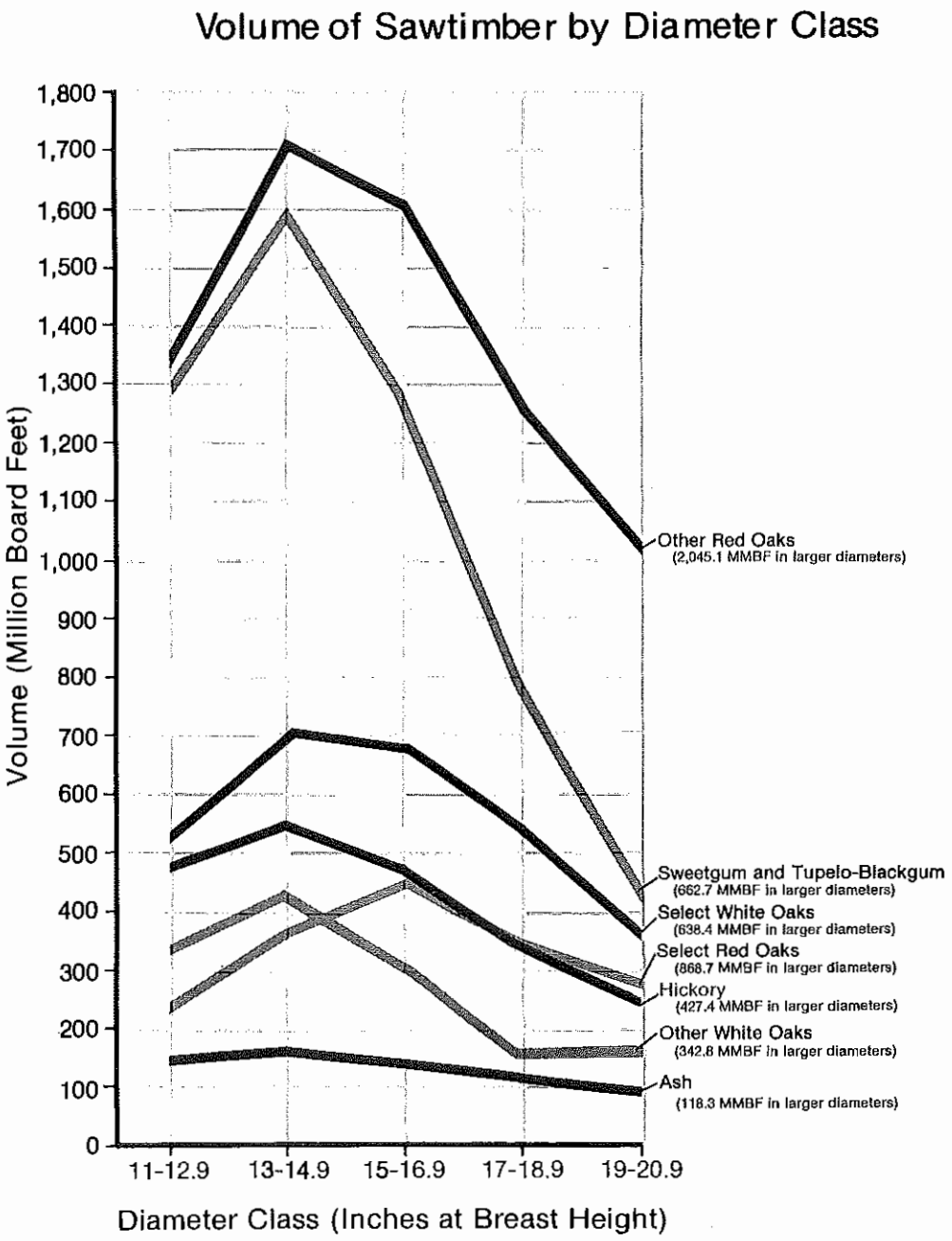


Figure 6. Hardwood sawtimber volume by species group and tree grade, Mississippi, 1987 (from USDA Forest Service, Donner and Hines, 1987, Table 25).

currently planned through the Mississippi Forest Products Utilization Laboratory. The study will address landowner attributes and physical resource attributes that constrain the quantities of hardwood timber available for harvest and processing in Mississippi within the relatively short planning periods of most processors and users of hardwood products. Landowner attributes include perceptions, objectives, or current uses for merchantable hardwood timberlands that may limit or preclude commercial harvests. Residential and specific recreational uses, for example, may be in direct conflict with potential timber harvests.

The study will also estimate the percentage of hardwood timber in the state that is not available for harvest for physical, site and stand reasons—hardwood timber that is not currently "operable." Operability of timber is "the relative ease or difficulty of managing or harvesting timber because of physical conditions in the stand or on the site" (Spencer et al. 1986). Potential operability problems include tree numbers, tree sizes and distribution, tract sizes, fragile soils, poor drainage, and inaccessibility (McWilliams and Rosson 1988).

In Minnesota, Spencer et al. used site and stand factors such as stand area, volume per acre, sawtimber volume per acre, percent of cull trees, average tree diameter, average merchantable height, and distance from maintained roads to define timber operability categories. Similar attributes should distinguish Mississippi hardwood timber stands that are not operable with expected near-term prices, costs, and technological conditions for harvesting, transportation, and processing.

Mississippi may have the potential to significantly increase value added through processing and manufacturing hardwoods grown within the state. Furniture manufacturers in the state are not currently perceived as using a high proportion of wood raw materials from Mississippi, yet the potential for such use appears to be high. Although availability issues must be considered, oak and other hardwood timber volumes suitable for furniture frames and interior parts appear to be physically plentiful in Mississippi, based on standing volumes and growth and removals from the 1987 Forest Survey. Studies that are currently planned will identify present sources of wood raw materials for Mississippi furniture manufacturing, as well as constraints to harvest for the state's merchantable hardwood timber; results will therefore show the degree to which suitable hardwood timber is **available** in the state, and the degree to which it is being **used** for furniture production—thereby addressing the potential for increased use and value added by the state's furniture industry.

Furniture frames and parts are not the only potential uses for Mississippi's hardwood timber. Technology is providing new and expanded markets for hardwoods that may compete with traditional uses, such as furniture and shipping (Anonymous 1987). In lumber, new drying techniques are overcoming problems of excessive warp in low density hardwoods, permitting their use in framing. New processes are also being developed to allow higher density hardwoods to be used in products made from wood strands or fibers—products that should replace softwood lumber in some applications.

In structural panels, softwood plywood is being replaced in many uses by reconstituted panel products; waferboard and oriented strand board can be made entirely from hardwoods.

In pulp and paper, hardwood fiber use is increasing due to advances in technology, and also because greater proportions of industry capacity are being devoted to higher quality printing and writing papers. Technology is also allowing greater use of hardwood fiber in the production of high quality linerboard.

Finally, although recent petroleum prices and inventories have not resulted in great attention to wood for fuel and energy, in the future much greater emphasis is expected, particularly in industrial and institutional applications (McClintock 1987).

In addition to new hardwood markets from technological gains, hardwood sawmills in the U.S. have recently been expanding sales to non-furniture lumber users (Barrett 1988). Broader markets for hardwood lumber are resulting from exports, and from increasing sales to lumber distribution yards. Hardwood sawmills and lumber yards have been installing increasing numbers of pre-dryers and kilns, decreasing the relative availability of air-dried lumber for furniture plants. When hardwood lumber demand decreases in the future, mills are expected to continue to kiln dry as much lumber as possible to recover the fixed costs of installation, further decreasing the relative availability of air-dried lumber for furniture uses (Barrett 1988).

Discussion

Furniture manufacturing has become a dominant industry in Mississippi. The industry's recent growth has been phenomenal in absolute terms, but also in relation to the growth of other industries, and to furniture industry growth in other states. Prospects are good for continued expansion in Mississippi. The state's advantages for furniture production in the mid-1960's are still apparent, the industry has attracted many raw materials suppliers to the state, and transportation advantages to major eastern and midwestern U.S. markets are being reinforced by new highway construction programs. Based on the costs of transportation, energy, labor, and taxes, Mississippi is currently one of the least costly states for manufacturing furniture (Rubin and Zorn 1986). Also, although competition for wood and other furniture raw materials is increasing, raw materials availability does not appear to be a limiting factor for further industry expansion. The greatest potential deterrent to furniture industry growth in Mississippi was recently identified as the cost of liability insurance (Mississippi Economic Council 1987).

Overall, the production and cost outlook for Mississippi's furniture producers is very favorable; potential growth may therefore rely heavily on future demand for the types of furniture produced in the state. One of the nation's largest regional investment banking and brokerage firms, Wheat, First Securities, Inc., recently listed several "external indicators" of U.S. consumer demand for furniture–single family housing starts, housing resales, consumer installment debt, the prime rate, mortgage rates, and the Dow Jones Industrial Average (Wheat, First Securities, Inc. 1988). A Senior Vice President with the firm, however, has said: "If you want to key in on a single number that affects the furniture industry, you've got to watch interest rates" (Epperson 1986). Interest rates influence housing starts and resales, and also have a direct impact on consumer spending. When interest rates are relatively low, for example, borrowing is less expensive, and there is also less incentive to save rather than spend. Interest rates have a further influence on furniture demand; lower mortgage rates in recent years have meant lower housing payments and higher discretionary incomes–a major influence on purchases of relatively "large-item" durable goods such as automobiles, appliances, and furniture (U.S. Department of Commerce 1987). The furniture industry is also just reaching its "healthiest moment" demographically (Epperson 1986). The "basic middle age group is maturing in the ages of 35 to 44. . . .They have 16 percent of the population and 23 percent of the discretionary income."

The U.S. Department of Commerce (1987) emphasizes several positive factors for furniture demand in the *U.S. Industrial Outlook, 1987.* Through 1991, growth in the 35-44 age group was projected at 3.3 percent per year, the largest of any age group, and disposable income, residential fixed investment, and personal consumption expenditures on non-auto durables were projected to increase from 2.5 to 3 percent per year above inflation. Uncertain factors in future demand for U.S. furniture include the effects of an older population, greater numbers of "non-family" households, and product competition from consumer spending on home electronics equipment. The *U.S. Industrial Outlook* for 1988 projects long-term growth in furniture demand, but also cautions that the current economic expansion in the U.S. is the longest peacetime expansion in U.S. history; an economic downturn before 1992 would moderate expected growth in real disposable income and would probably reduce housing starts "for the next several years" (U.S. Department of Commerce 1988).

Competition from furniture imports is also expected to continue, although U.S markets for upholstered, wood household furniture have been "largely insulated from foreign competition" (U.S. Department of Commerce (1985):

"Upholstered furniture is very expensive to transport due mainly to the high risk of fabric destruction and its high volume-to-weight ratio. Characteristics of the U.S. market also inhibit foreign suppliers; because of the large number of style and fabric combinations, upholstered furniture is often produced on order rather than for inventory which greatly increases the delivery time for foreign producers. Foreign producers are forced to offer a very limited fabric selection because of inventory considerations. The Canadian upholstered furniture industry, the major foreign supplier to the United States, is an exception because of its close proximity to major U.S. cities."

Vertical integration and consolidation among U.S. furniture companies is a recent trend that is expected to continue–partly because of trends in interest rates and the relatively strong financial performance of U.S. furniture producers in recent years, but also to help attain the purchasing, production, and marketing efficiencies necessary to compete with foreign producers.

Overall, the U.S. outlook for furniture production

is favorable, and long-term, continued growth is expected for domestic furniture markets. Mississippi furniture producers share a favorable supply and demand outlook for their products. There are many problems confronting the state's industry, however, and many areas which merit study. Important areas of current study in the Mississippi Forest Products Utilization Laboratory are the availability and use of both wood and non-wood raw materials, and processing efficiencies in manufacturing. New methods, machines, and greater efficiency in application of both capital and labor inputs will help maintain and enhance the industry's productivity and competitiveness with U.S. and foreign manufacturers. Such efforts will help assure continued long-term prosperity for the industry in Mississippi, with continued and increasing contributions to output, employment, and income in the state.

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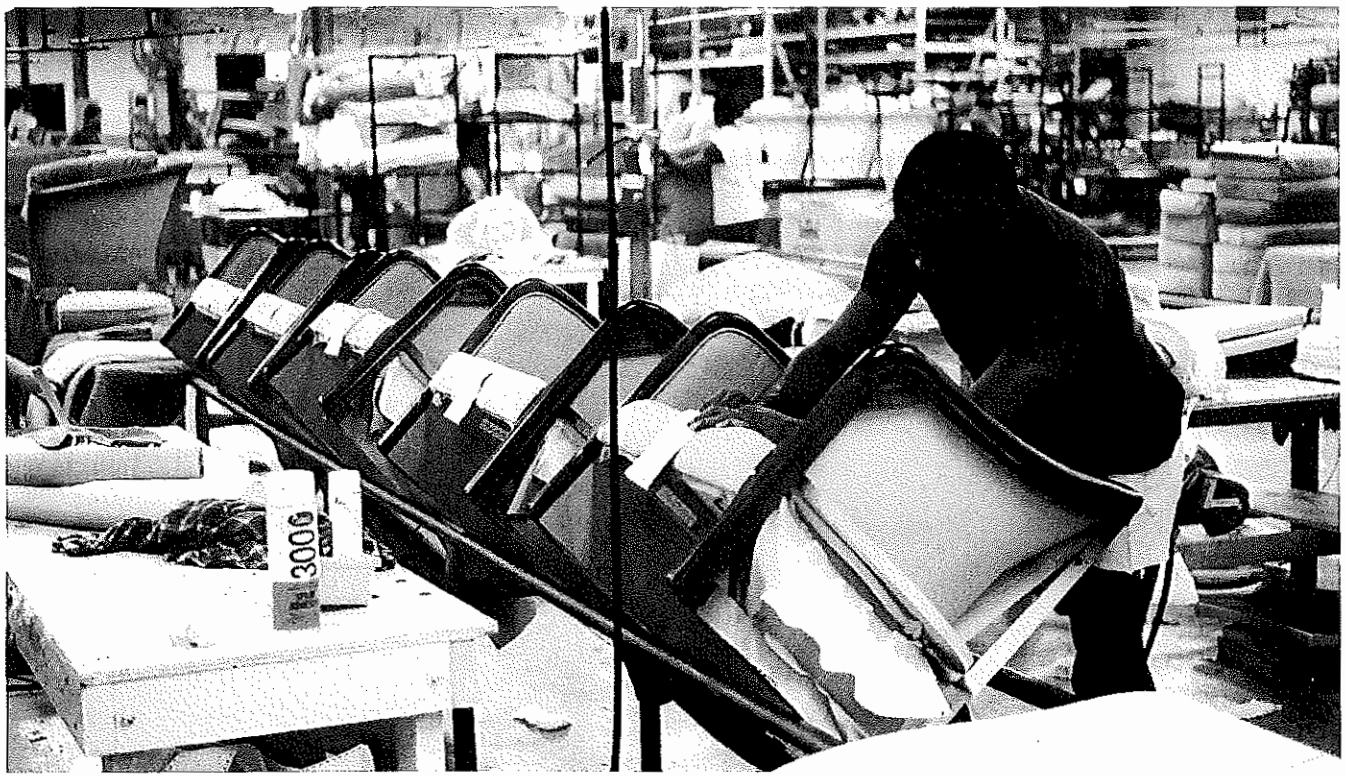

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Appendix A

Census of Manufactures Major Group 25 – Furniture and Fixtures

The description and listings below are adapted from the *Standard Industrial Classification Manual, 1972* (U.S. Office of Management and Budget 1972).

The Furniture and Fixtures "Major Group" includes "establishments engaged in manufacturing household, office, public building, and restaurant furniture; and office and store fixtures. Establishments primarily engaged in the production of millwork are classified in Industry 2431; wood kitchen cabinets in Industry 2434; cut stone and concrete furniture in Major Group 32; laboratory and hospital furniture in Major Group 38; beauty and barber shop furniture in Major Group 39; and woodworking to individual order or in the nature of reconditioning and repair in non-manufacturing industries."

Group No.	Industry No.	
251		**HOUSEHOLD FURNITURE**
	2511	Wood Household Furniture, Except Upholstered "Establishments primarily engaged in manufacturing wood household furniture commonly used in dwellings." The list below includes the following modifiers, where appropriate: "wood," "household," and "except upholstered."

Beds	Cots	Nursery furniture
Bookcases	Cradles	Play pens
Breakfast sets	Cribs	Rockers
Bridge sets	Desks	Screens, privacy
Buffets	Dining room furniture	Secretaries
Cedar chests	Dressers	Stands, telephone, bedside
Chairs, bentwood	Dressing tables	Stools
Chairs	End tables	Storage chests
Chests, silverware	Frames for boxsprings	Swings, porch
Chiffoniers & chifforobes	Garden furniture	Tables
China closets	Headboards	Tea wagons
Coffee tables	High chairs	Vanity dressers
Commodes	Juvenile furniture	Wardrobes
Console tables	Magazine racks	Whatnot shelves

	2512	Wood Household Furniture, Upholstered "Establishments primarily engaged in manufacturing upholstered furniture on wood frames." **The list below therefore includes the modifiers "upholstered," and "with wood frames."**

Chairs	Living room furniture
Couches	Other household furniture
Davenports	Rockers
Juvenile furniture	Sofas

	2514	Metal Household Furniture
	2515	Mattresses and Bedsprings
	2517	Wood Television, Radio, Phonograph, and Sewing Machine Cabinets
	2519	Household Furniture, Not Elsewhere Classified

(continued)

Group No.	Industry No.	
252		**OFFICE FURNITURE**
	2521	Wood Office Furniture
	2522	Metal Office Furniture
253		**PUBLIC BUILDING AND RELATED FURNITURE**
	2531	Public Building and Related Furniture
254		**PARTITIONS, SHELVING, LOCKERS, AND OFFICE AND STORE FIXTURES**
	2541	Wood Partitions, Shelving, Lockers, and Office and Store Fixtures
	2542	Metal Partitions, Shelving, Lockers, and Office and Store Fixtures
259		**MISCELLANEOUS FURNITURE AND FIXTURES**
	2591	Drapery Hardware and Window Blinds and Shades
	2599	Furniture and Fixtures, Not Elsewhere Classified

Mention of a trademark or proprietary product does not constitute a guarantee or warranty of the product by the Mississippi Agricultural and Forestry Experiment Station and does not imply its approval to the exclusion of other products that also may be suitable.

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