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Evaluating Change In Regional Economic Contributions Of Forest-Based Industries In The South

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EVALUATING CHANGE IN REGIONAL ECONOMIC CONTRIBUTIONS OF

FOREST-BASED INDUSTRIES IN THE SOUTH

By

Bart Keith Tilley

A Thesis
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
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in Forest Management and Economics
in the Department of Forestry

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2006

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FOREST-BASED INDUSTRIES IN THE SOUTH

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Timberlands in the South provide a large resource base for forest-based

industry. This resource base is utilized to provide economic contributions to the

southern economy. Aruna et al. (1997) examined southern forest-based industry

economic contributions from the early 1990's. In 1992, southern forest-based

industries provided 633,367 jobs and this increased to 718,176 in 2001, accounting

for only 1.3% of the total employment in the South versus 1.5%. Forest-based

earnings in the South experienced a real increase of $181 million (1990 dollars) and

accounted for 1.7% of total southern U.S. earnings in both years. The value of

shipments from southern forest-based industries increased $22.8 billion in real 1991

dollars and value-added increased $11.0 billion. In 2001, value of shipments

increased to 9.6% of the South's total from 7.8% in 1991 and value-added increased

from 8.0% in 1991 to 9.1% in 2001. Overall there was little relative change over this

time period.

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CHAPTER I

INTRODUCTION

The South's forest lands provide many forest-based products produced in the United States. Thus, southern forest-based industries provide major contributions to the economy. Due to logging restrictions in the Pacific Northwest as a result of northern spotted owl (*Strix occidentalis caurina*) habitat protection and other changes within the industry, there has been an increasing potential for the South to capture additional forest-based economic activity (Guan and Munn 2000). Understanding how these contributions are changing is important in guiding policy and regulation formation and industry decisions.

Aruna et al. (1997) determined the economic contributions of each southern state's forest-based industries and provided a snapshot of their contributions to state and regional economies. Forest-based industries accounted for 633,367 (full- and part-time jobs) in 1992 and $15.3 billion in wages in 1990. In 1991, manufacturing value-added totaled $31.6 billion and comprised 1.9% of the gross state product in the South. The purpose of this project was to evaluate the change in economic contributions of forest-based industries in the South since the early 1990's. By evaluating these changes in their contribution to the southern economy, important trends in the industry (e.g. relative and absolute importance and geographic changes

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within the region) and policy implications (e.g. use-value taxation and eminent domain) can be identified.

Objectives

1. Determine the economic contribution of forest-based industries for each of 13 southern states and the region by calculating employment, earnings, value of shipments, and value-added using comparable data.

2. Determine the federal, non-defense taxes, and state and local government, non-education taxes generated by southern forest-based industry.

3. Determine economic multipliers for total output, employment, value-added, and total and personal income. Determine the relative importance of forest-based industries to the state economies.

4. Compare and contrast these results to those found by Aruna et al. (1997) and discuss similarities/differences and changes over time.

5. Discuss the implications for policy formation.

CHAPTER II

LITERATURE REVIEW

Forest-based industries in the South provide a major contribution to the state economies (Leatherman and Marcouiller 1999). Logging restrictions in the Pacific Northwest have shifted the supply of wood to the South (Powell et al. 1993). After logging restrictions were put in place new capital investment in the Pacific Northwest's logging and lumber and wood products sectors continued to decrease, but stopped decreasing and began increasing in the South (Guan and Munn 2000). The forest-based industry in the southeastern U.S. has become a leading supplier of the country's forest products, supplying 60% of the Nation's forest products (Prestemon and Abt 2002). The South, however, only accounts for 24% of the land area in the United States (Abt et al. 2002). As demand from forest-based industries increases, its contribution to the economy will also become more prominent. The predominant land cover type of most southern states is timberland (Wear 2002). This resource base allows forest-based industries to obtain their raw materials almost exclusively from local inputs, thereby increasing their economic contribution. Despite pressures from urbanization, the timberland resource base is growing (Conner and Hartsell 2002). In 1992, a resource base of over 199.3 million acres of timberland in the South provided an opportunity for increased importance of the

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southern forest-based industry (Powell et al. 1993). The resource base in the South increased to 202.7 million acres of timberland by 2002 (Smith et al. 2004). Most southern states are generally rural areas in which forest-based industries are a major employer. Without the operation of these industries many rural areas would lose an important component of their economic contribution (Munday and Roberts 2001).

Studies showing the importance of forest-based industries are useful in guiding policy and regulation of the industry and its land base. Sample and Le Master (1992) discussed how economic impact studies were used in policymaking concerning northern spotted owl habitat protection in the Pacific Northwest. Although four studies the authors examined had drastically different results due to differences in assumptions, they provided critical information to aid in the policymaking decisions. The United States Supreme Court's ruling in June 2005 changed the use of eminent domain to include, but not be limited to, new jobs and increased tax revenue as long as there was an economic development plan that outlined the benefits (Kelo et al. 2005). All 13 southern states included in this study have some form of use-value tax laws that include forestry as a category eligible for a lower tax rate (Granskog et al. 2002). Without knowledge or evidence of the forest-based industry contributions to the economy, lawmakers may be more inclined to condemn forest land for public use.

Current use-value taxation has been used to attempt to slow the development of farmland and timberland by allowing these operations to be more profitable due to a lower tax rate. Anderson (1993), using econometric analysis, found that use-value

taxation was most effective in delaying conversion of farmland for development as the difference between farming value and development value increased. Ferguson and Spinelli (1998) evaluated the 1971 use-value tax change in Virginia and determined that the change in taxation had little or no effect on the historical rate at which farmland was developed, even though property values have increased at much higher rates. They stated that other taxpayers received no benefit from these tax breaks because the conversion rate remained unchanged, but did not examine what the conversion rate would have been had the tax breaks not been enacted. This study also ignored the non-market benefits of the forest to the other taxpayers which included aesthetics and water quality protection.

The economic contributions of timberlands are much larger than the market impacts of the forest-based industries they support. Many other non-market (e.g., soil and water quality and aesthetics) and wildlife and recreation benefits are derived from timberland. Murthy et al. (2002) found non-market forest benefits to be at least as large as, if not larger than, market benefits. Non-market benefits included aesthetics and soil and water quality protection. Carbon sequestration was identified as potentially another major benefit from timberland. In addition, hunting expenditures in the South totaled more than $6.7 billion with an additional $7.9 billion spent on wildlife watching (U.S. Department of Interior and U.S. Department of Commerce 2002).

Input-output Analysis

Input-output models use changes in one industry to determine how those changes will influence other industries and the economy (Flick et al. 1980, Hotvedt et al. 1989). These models define the relationship between industries in the study area by tracing how the outputs from one sector become inputs for other sectors and which sectors provide inputs to that sector (Teeter and Alward 1988). For example, if a sawmill increases output, more inputs are required to produce those outputs. The mill must buy more raw materials to produce the additional lumber and pay for additional units of labor to operate and maintain equipment. As raw material requirements increase, more truck drivers, loggers, and their input materials are required to deliver raw materials to the mill. The additional expenditures and increased output that, in turn, affect the rest of the economy determine economic contribution. Creation of new jobs or additional income will result in increased household spending, thereby generating an impact on the economy.

An input-output model's data can be obtained using survey, partial survey, or non-survey methods (Busby 1987). Non-survey data is estimated from national, regional, and state data in an attempt to provide an accurate picture of the economy. Survey data typically provides a better picture of how the economy actually operated, but is difficult to collect and impractical for large study areas. Aggregation of input-output model data has little impact on the economic multipliers generated by the model (Hewings 1972). Hewings (1972) and Crown (1987) both warn about errors that result from excessive aggregation of the model's sectors.

IMPLAN

Impact Analysis for Planning (IMPLAN) software was developed by the U.S. Forest Service for evaluating the social and economic impacts of management alternatives in Forest Service planning (Minnesota IMPLAN Group 1997). Maki et al. (1989) detail IMPLAN's uses and the software's modeling specifications. IMPLAN is an input-output model that was originally based on 528 industrial sectors in the US economy. IMPLAN databases are available on national, state, county, and zip code levels. IMPLAN data outputs include employment, earnings, total output, value-added, tax impacts, and economic multipliers.

IMPLAN is an input-output model that uses secondary data to determine economic impacts (Busby 1987). It allows the user to run models using the non-survey data or enter more accurate data from other sources. Hotvedt et al. (1989) examined the accuracy of IMPLAM outputs using the non-survey secondary data and known outputs in the state of Louisiana. They found the accuracy to vary depending on the sector being examined. Idassi et al. (2000) modeled the impact of forestry and the forest products industries in Tennessee by adjusting the IMPLAN data with data from the state. Aruna and Cubbage (2001) examined the change in economic contribution from forest products and tourism between 1977 and 1996 using the IMPLAN data. IMPLAN county level data can also be adjusted to reflect only a portion of a county if desired (Leatherman and Marcouiller 1999).

Multipliers

The effect of increased output is measured by the amount of economic activity generated by the original activity (Flick and Teeter 1988). A multiplier of 2.5 means that for every $1 increase in mill output, an additional $1.50 in output will occur in the rest of the economy (Flick and Teeter 1988). The magnitude of multipliers is determined by quantities of inputs to the industry that are obtained from within the study area. If most inputs are from within the region of interest then multipliers will be high because the benefits of the extra expenditures are captured by the economy being studied. On the other hand, if most of the inputs are brought in from outside the economy, multipliers will be low and the effect will be captured by economies outside the study area.

Multipliers are calculated using the direct, indirect, and induced effects generated by the original activity in the sector (Minnesota IMPLAN Group 1997). Direct effects are the expenditures in the individual industry sector that inputted into the input-output model. Indirect effects are the impacts caused by purchasing between industries for the sector to produce its products. Induced effects occur because of household spending due to that sector's operation. Type I multipliers are calculated by adding the direct and indirect effects and dividing by the direct effects. This only examines the impact of industry because it does not include household spending. Type II, Type III and Social Accounting Matrix (SAM) multipliers are all calculated by adding the direct, indirect, and induced effects and dividing by the direct effects. The difference between them is how the induced effects are calculated.

Type II multipliers include induced effects based on income in the study area. Type III multipliers include induced effects based on employment by using per capita expenditure for each employee in the study area. According to Charney and Leones (1997) IMPLAN Type III multipliers, reported by Aruna et al. (1997) using the 1992 database, were flawed in the calculations within IMPLAN. IMPLAN Type III multipliers tend to overstate induced impacts in low-wage sectors while understating induced impacts for high-wage sectors. This problem was corrected with the introduction of the Windows based IMPLAN software and SAM multipliers are now widely used. IMPLAN Type III and SAM multipliers are both calculated by summing the direct, indirect, and induced effects and dividing by the direct effects. The problem with Type III multipliers is that average propensity to consume instead of marginal propensity to consume was used in the IMPLAN calculations. This makes the IMPLAN Type III multipliers closer to Type II multipliers than the traditional Type III multiplier. The introduction of SAM multipliers corrected this error in calculating the correct multiplier.

Forest-based industries in the South generally have larger multipliers than other industries because their raw material inputs are locally supplied (Flick and Teeter 1988). High transportation costs and an abundance of raw materials available in the area reduce the feasibility of finding other sources. As a result, forest-based industries will have a greater economic contribution to the local economy than other industries.

CHAPTER III

METHODS

Data comparable to that used by Aruna et al. (1997) were used to evaluate changes in the forest-based industries since the early 1990's as well as their current condition in the South. These data were collected for the region as a whole and for each of the 13 individual states. The region was comprised of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. Forest-based earnings reported by Aruna et al. (1997) were obtained from the American Forest and Paper Association's Facts and Figures report for 1995 which reported earnings for 1990. This study reports forest-based earnings from the most recent American Forest and Paper Association Forest Facts and Figures report for 2001, which reported data for 1998. These data were only reported for three sectors, forestry, paper and allied products, and lumber and wood products. To compute real changes in forest-based earnings, 1998 dollars were deflated to 1990 dollars, using deflators from the 2001 IMPLAN database.

The U.S. Department of Commerce 1991 Annual Survey of Manufacturers report was used by Aruna et al. (1997) for value of shipments, manufacturing value-added, and Gross State Product (GSP). Value of shipments and value-added were

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reported for only SIC sectors 24 and 26. For this study, manufacturing value-added, manufacturing value of shipments, and GSP values were obtained from the 2001 Annual Survey of Manufacturers (U.S. Department of Commerce 2003). Forest-based industries were identified by the North American Industrial Classification System (NAICS) codes 321, wood products manufacturing, and 322, paper manufacturing. These dollar values were deflated from 2001 dollars to 1991 dollars using the 2001 IMPLAN database deflators. The appropriate IMPLAN deflator for each aggregated sector was used for these calculations and was reported in the appendix.

Aruna et al. (1997) used the 1992 IMPLAN database to provide forest-based employment and economic multipliers for output, employment, value added, and total and personal income resulting from forest-based industries. They used the SIC sectors 24, 25, and 26 to identify the IMPLAN sectors, but only 24 and 25 for value of shipments and value-added. The 2001 IMPLAN database used in our study consisted of the reconfigured sector classifications reducing the number of sectors from 528 sectors to 509. This reflected the U.S. Census Bureau's change from the U.S. Standard Industrial Classification (SIC) system to the North American Industrial Classification System (NAICS). The Minnesota IMPLAN Group (MIG, Inc.) provided a bridge table that detailed on how these new sectors related to the old. This information was used to aggregate the individual sectors into the three main forest-based sectors for the 2001 data so it was comparable to the aggregated 1992 data used by Aruna et al. (1997).

IMPLAN models were constructed for each of the 13 states for Type III and SAM multipliers and impacts ran for each of the forest-based industry sectors. Each model was constructed using data from the 2001 IMPLAN database and the individual forest-based industries were aggregated into the three main forest-based industry sectors: lumber and wood products, paper and allied products, and wood furniture. The lumber and wood products sector consisted of logging; sawmills; wood preservation; reconstituted wood product manufacturing; veneer and plywood manufacturing; engineered wood member and truss manufacturing; cut stock, resawn lumber, and planning; other millwork, including flooring; wood container and pallet manufacturing; prefabricated wood building manufacturing; and miscellaneous wood product manufacturing sectors. The paper and allied products sector contained pulp mills; paper and paperboard mills; paperboard container manufacturing; surface-coated paperboard manufacturing; coated and laminated paper and packaging materials; coated and uncoated paper bag manufacturing; die-cut paper office supply manufacturing; envelope manufacturing; sanitary paper product manufacturing; and all other converted paper product manufacturing sectors. The wood furniture sector consisted of wood windows and door manufacturing; wood kitchen cabinet and countertop manufacturing; upholstered household furniture manufacturing; nonupholstered wood household furniture manufacturing; institutional furniture manufacturing; other household and institutional furniture; wood office furniture manufacturing; custom architectural woodwork and millwork; and showcases, partitions, shelving, and lockers sectors. These aggregated sectors were used to obtain

forest-based employment data, federal non-defense and state and local government non-education tax contributions, and economic multipliers for employment, total and personal income, total output, and value-added for each of the 13 states. Tax contributions generated by IMPLAN are labeled federal non-defense and state and local non-education because IMPLAN was set up to allow examination of government spending not including defense and education spending (MIG Inc., personal communication, November 16, 2005). The taxes are collected through the non-defense and non-education sectors and thus the labels federal non-defense and state and local non-education taxes.

These IMPLAN models were initially run using the IMPLAN aggregated total employment data for each forest-based sector. This provided total employment in each sector greater than the total reported by IMPLAN. The input employment was decreased until the total sector employment from the impact analysis equaled the total aggregated total employment reported in the 2001 IMPLAN database. If this is not done, the economic contributions will be based on inflated employment numbers. Forest-based industry employment was reported directly from the aggregated sector totals. The economic multipliers, federal government, non-defense taxes and state and local government, non-education taxes generated by the South's forest-based industries were obtained from these models' impact analysis. Type III multipliers were reported for comparison to the multipliers Aruna et al. (1997) reported because Type III multipliers are calculated the same way as those reported in their study and differences could be identified (MIG Inc., personal communication, January 26,

2005). SAM multipliers were included in the appendix for this project for future comparisons.

To compare the importance of the forest-based industry to each state's economy, an average ranking of employment, earnings, value of shipments, and value-added was computed. The importance of forest-based industry to each state was determined by computing the percentage of the total economy that was accounted for by the forest-based industry, for each of the four categories. Next, states were ranked according to the relative size of their forest-based industry. This process was applied to 1992 and current data. The state with the highest percentage was ranked first, the second highest percentage second, and continuing for each state. The four ranks were summed and divided by four to determine the average state rank. This provided a rough measure of the relative importance of the forest-based industry to each state economy.

Included in the appendix are employment, total income, personal income, total output, and value-added using only data from the 2001 IMPLAN database. The tax contributions and multipliers reported in the results are also from the 2001 IMPLAN database. This provides data from a common year and will allow for easier comparisons in the future.

CHAPTER IV

ECONOMIC CONBTRIBUTION OF FOREST-BASED

INDUSTRY

Forest-Based Employment

From 1992 to 2001, forest-based industry employment in the South, in relation to total U.S. employment, remained unchanged at 1.1%, even though total employment in the South increased from 31.0% to 32.2% of total U.S. employment. In 2001, forest-based industries employed 718,176 (full- and part-time jobs), up from 633,367 in 1992 (Table 1 and Table 2). Total forest-based employment in the South decreased as a percentage of total U.S. forest-based employment from 39.9% to 39.0%. Lumber and wood products sector employment in the South decreased from 210,105 (full and part time jobs) to 197,037, but increased as a percentage of total U.S. lumber and wood products sector employment, from 34.8% in 1992 to 41.5%, in 2001. Wood furniture sector employment in the South increased from 117,455 (full- and part-time jobs) to 260,459, but decreased as a percentage of total U.S. wood furniture sector employment, from 57.2% to 39.7%. Paper and allied products sector employment in the South decreased from 296,303 (full and part time jobs) to 254,616, but increased from 29.9% of U.S. paper and allied products sector employment in 1992 to 35.2% in 2001.

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Table 1.   1992 southern United States forest-based employment derived from the
           1992 IMPLAN database (Aruna et al. 1997)

State	Total State Employment	Forestry	Paper and Allied Products	Wood Furniture	Lumber and Wood Products	Total Forest-Based	Total Forest-Based as % of Total State
			Number of employees				%
Alabama	2,129,834	849	21,148	5,867	30,969	58,833	2.8
Arkansas	1,274,478	316	14,172	5,370	22,509	42,367	3.3
Florida	7,111,231	1,570	13,464	5,667	19,210	39,911	0.6
Georgia	3,768,056	1,405	31,228	4,714	28,960	66,307	1.8
Kentucky	2,016,886	245	8,904	2,404	16,454	28,007	1.4
Louisiana	2,060,312	402	12,214	455	13,039	26,110	1.3
Mississippi	1,249,574	305	8,970	4,154	28,101	41,530	3.3
North Carolina	4,055,213	591	22,714	46,023	38,893	108,221	2.7
Oklahoma	1,696,144	122	3,911	1,271	3,699	9,003	0.5
South Carolina	1,953,687	992	11,848	3,375	15,296	31,511	1.6
Tennessee	2,873,863	423	21,247	11,762	21,438	54,870	1.9
Texas	9,354,518	974	23,638	7,795	32,558	64,965	0.7
Virginia	3,776,416	1,310	16,647	18,598	25,177	61,732	1.6
South Total	43,320,212	9,504	210,105	117,455	296,303	633,367	1.5
U.S. Total	139,676,090	33,764	701,800	205,190	852,200	1,587,764	1.1
South % of U.S.	31.0	28.1	29.9	57.2	34.8	39.9	

Table 2.   2001 southern United States forest-based employment derived from the
           2001 IMPLAN database

State	Total State Employment	Forestry	Paper and Allied Products	Wood Furniture	Lumber and Wood Products	Total Forest-Based	Total Forest-Based as % of Total State
			Number of employees				%
Alabama	2,421,223	338	16,356	14,530	25,467	56,691	2.3
Arkansas	1,517,570	546	13,479	9,926	20,362	44,313	2.9
Florida	9,172,732	838	11,614	19,008	17,077	48,537	0.5
Georgia	4,964,658	1,018	27,910	16,144	26,761	71,833	1.4
Kentucky	2,327,652	57	10,616	8,415	16,047	35,135	1.5
Louisiana	2,502,534	548	10,542	1,732	13,544	26,366	1.1
Mississippi	1,481,891	459	7,762	27,121	21,748	57,090	3.9
North Carolina	4,924,710	517	21,148	71,997	29,921	123,583	2.5
Oklahoma	2,064,469	113	2,930	3,753	4,265	11,061	0.5
South Carolina	2,280,026	381	14,736	6,129	13,121	34,367	1.5
Tennessee	3,472,042	209	20,573	23,762	17,172	61,716	1.8
Texas	12,638,113	835	26,004	32,058	28,435	87,332	0.7
Virginia	4,523,325	175	13,367	25,914	20,696	60,152	1.3
South Total	54,290,945	6,034	197,037	260,489	254,616	718,176	1.3
U.S. Total	168,743,115	11,875	559,692	655,420	613,772	1,840,759	1.1
South % of U.S.	32.2	50.8	35.2	39.7	41.5	39.0	

There have been substantial shifts forest-based employment from 1992 to 2001 within the region. Employment in the lumber and wood products sector accounted for 46.8%, but decreased to 35.5% of total southern forest-based employment. Wood furniture sector employment increased from 18.5 to 36.2% of total southern forest-based employment. The paper and allied products sector employment accounted for 33.2% of total southern forest-based employment in 1992 compared to 27.4% in 2001. Overall the South experienced an increase in forest-based employment of 13.4% while total employment in the South increased by 25.3%. Mississippi and Texas had increases in forest-based employment that exceeded the increase in total employment in the South of 37.5 and 34.4%, respectively. Forest-based employment increased at rates greater than the South-wide average in Florida, Kentucky, Mississippi, North Carolina, Oklahoma, and Texas.

The region and each state experienced an increase in total employment from 1992 to 2001 but there was a decrease in the relative forest-based employment for the region from 1.5 to 1.3%. Employment in the lumber and wood products sector increased only in Louisiana and Oklahoma. Wood furniture sector employment increased in every state. Paper and allied products sector employment increased only in Arkansas, Kentucky, South Carolina, and Texas. Alabama and Virginia were the only two states where total forest-based employment declined over this time period, losing 2,142 and 1,580 jobs, respectively, accounting for 3.6 and 2.6% of their 1992 total forest-based employment. Mississippi and Kentucky were the only states in which total forest-based employment increased in relative terms, accounting for an

additional 0.6 and 0.1%, respectively, of total state employment. Total forest-based

industry employment was highest in North Carolina, Texas, and Georgia in 1992 and

2001 (Figure 1), but accounted for fewer jobs in relation to total state employment

than in other states (Figure 2).
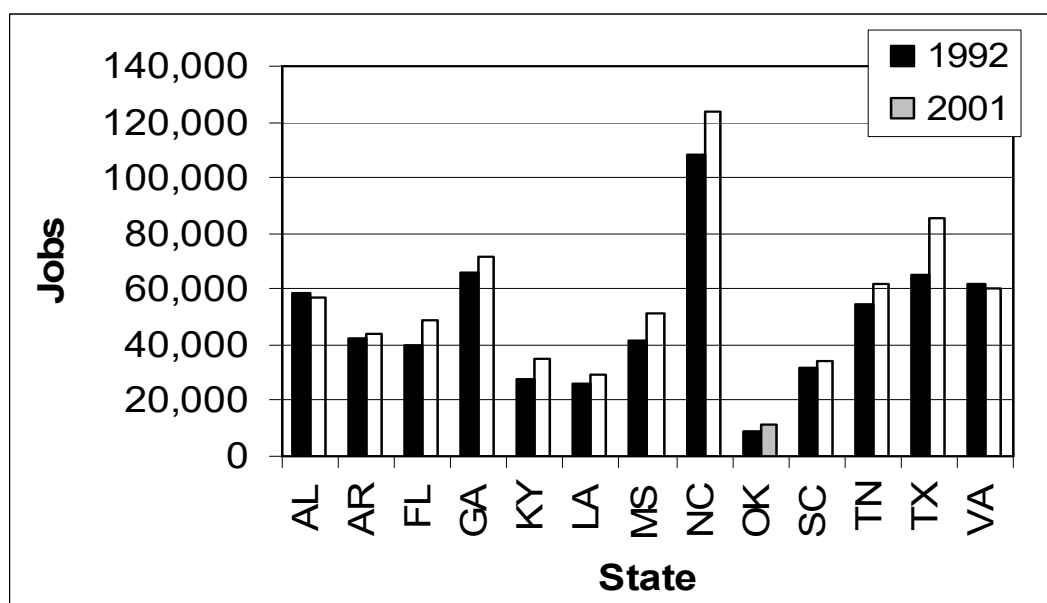
Figure 1. Number of forest-based industry jobs by state in the southern United States
for 1992 (Aruna et al. 1997) and 2001
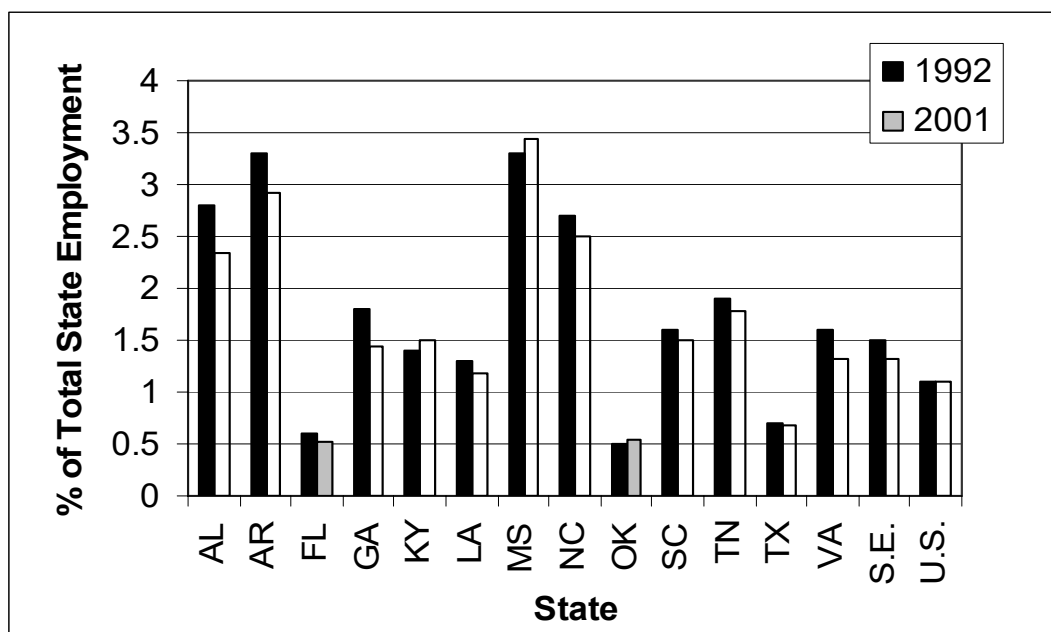
Figure 2. Forest-based industry jobs in the southern United States as a percentage of
total state employment for 1992 (Aruna et al. 1997) and 2001

Forest-Based Earnings

Forest-based industry earnings increased $3.3 billion in nominal dollars for
the region from 1990 (Table 3) to 1998 and increased for every state (Table 4). This
translated into a real increase of $181 million (1990 dollars) (Table 5). As a
percentage of total earnings in the South, forest-based industry earnings remained at
1.7%. U.S. forest-based earnings decreased as a percentage of total U.S. earnings
from 1.4% in 1990 (Aruna et al. 1997) to 1.3% in 1998 (American Forest and Paper
Association 2001). The South saw an increase in real forest-based earnings of 1.2%,
but real U.S. forest-based earnings decreased 8.1%. Even though southern forest-
based employment decreased as a percentage of total forest-based U.S. employment

from 39.0 to 39.9%, southern forest-based earnings increased as a percentage of total

U.S. forest-based earnings from 33.1% in 1990 to 36.5% in 1998. The South

accounted for only 28.8% of the total U.S. earnings in 1998, but accounted for 36.5%

of total U.S. forest-based industry earnings in 1998. Earnings from each of the

southern forest-based industries sectors increased as a percentage of total U.S. forest-

based earnings. The lumber and wood products sector earnings increased from 34.8%

of total U.S. forest-based earnings in 1990 to 39.4% in 1998; and in the paper and

allied products sector, earnings increased from 31.5 to 34.0%.

Table 3.   1990 forest-based earnings by state, region, and the United States for each
forest-based industry sector (Aruna et al. 1997)

State	Total State Earnings	Forestry	Paper and Allied Products	Lumber and Wood Products	Total Forest-Based	Total Forest-Based as % of Total State
			millions $			%
Alabama	43,672	22	963	687	1,672	3.8
Arkansas	23,617	17	484	481	982	4.2
Florida	150,022	18	513	545	1,076	0.7
Georgia	85,021	32	1,245	782	2,059	2.4
Kentucky	39,235	0	309	286	595	1.5
Louisiana	43,561	9	527	308	844	1.9
Mississippi	22,622	11	331	618	960	4.2
North Carolina	82,612	8	827	883	1,718	2.1
Oklahoma	33,764	1	129	79	209	0.6
South Carolina	39,208	37	659	365	1,061	2.7
Tennessee	58,349	3	743	490	1,236	2.1
Texas	214,975	14	868	761	1,643	0.8
Virginia	86,737	2	612	646	1,260	1.5
South Total	923,395	174	8,210	6,931	15,315	1.7
U.S. Total	3,378,897	350	26,024	19,938	46,312	1.4
South % of U.S.	27.3	49.7	31.5	34.8	33.1	

Table 4. 1998 forest-based earnings by state, region, and the United States for each forest-based industry sector

State	Total State Earnings	Forestry	Paper and Allied Products	Lumber and Wood Products	Total Forest-Based	Total Forest-Based as % of Total State
			millions $			%
Alabama	50,502	38	1,046	961	2,045	4.0
Arkansas	26,612	19	571	543	1,134	4.3
Florida	181,733	39	582	555	1,176	0.6
Georgia	110,011	56	1,464	1,211	2,731	2.5
Kentucky	45,559	0	427	297	724	1.6
Louisiana	49,382	25	543	379	946	1.9
Mississippi	26,648	31	397	682	1,110	4.2
North Carolina	103,644	26	962	1,100	2,089	2.0
Oklahoma	35,419	3	165	92	260	0.7
South Carolina	45,544	44	830	392	1,266	2.8
Tennessee	72,123	6	863	532	1,401	1.9
Texas	266,423	25	1,123	1,154	2,302	0.9
Virginia	103,582	12	798	668	1,478	1.4
South Total	1,117,181	324	9,771	8,567	18,662	1.7
U.S. Total	3,885,668	621	28,736	21,741	51,098	1.3
South % of U.S.	28.8	52.1	34.0	39.4	36.5	

Source: American Forest and Paper Association Facts and Figures 2001 Report

Table 5. 1998 forest-based earnings by state, region, and the United States by forest-based industry sector expressed in 1990 dollars

State	Total State Earnings	Forestry	Paper and Allied Products	Lumber and Wood Products	Total Forest-Based	Total Forest-Based as % of Total State
			millions $			%
Alabama	43,366	36	970	707	1,712	3.9
Arkansas	22,719	18	521	400	939	4.1
Florida	148,763	37	526	412	975	0.7
Georgia	91,935	51	1,295	908	2,254	2.5
Kentucky	39,772	0	375	223	599	1.5
Louisiana	44,040	23	498	281	802	1.8
Mississippi	22,879	29	362	502	894	3.9
North Carolina	89,705	24	863	815	1,702	1.9
Oklahoma	31,410	3	150	68	220	0.7
South Carolina	38,136	41	750	289	1,080	2.8
Tennessee	60,942	6	785	392	1,183	1.9
Texas	236,049	23	1,003	855	1,881	0.8
Virginia	85,828	11	722	494	1,227	1.4
South Total	957,758	303	8,865	6,327	15,496	1.6
U.S. Total	3,314,868	582	25,917	16,044	42,543	1.3
South % of U.S.	28.9	52.1	34.2	39.4	36.4	

Changes in forest-based industry earnings within the region have been relatively minor from 1990 to 1998. Paper and allied products sector earnings decreased as a percentage of total southern forest-based earnings from 54.3 to 52.4%. The lumber and wood products sector accounted for 45.3% of total southern forest-based earnings in 1990, compared to 45.9% in 1998. Forest-based earnings decreased as a percentage of total state earnings in Florida, North Carolina, Tennessee, and Virginia. Forest-based earnings in Alabama, Georgia, Oklahoma, South Carolina, and Texas increased at higher percentages than the South-wide average. Total forest-based industry earnings were the highest in Georgia, Texas, and North Carolina (Figure 3). Total forest-based earnings as a percentage of total state earnings were highest in Arkansas, Mississippi, and Alabama (Figure 4).
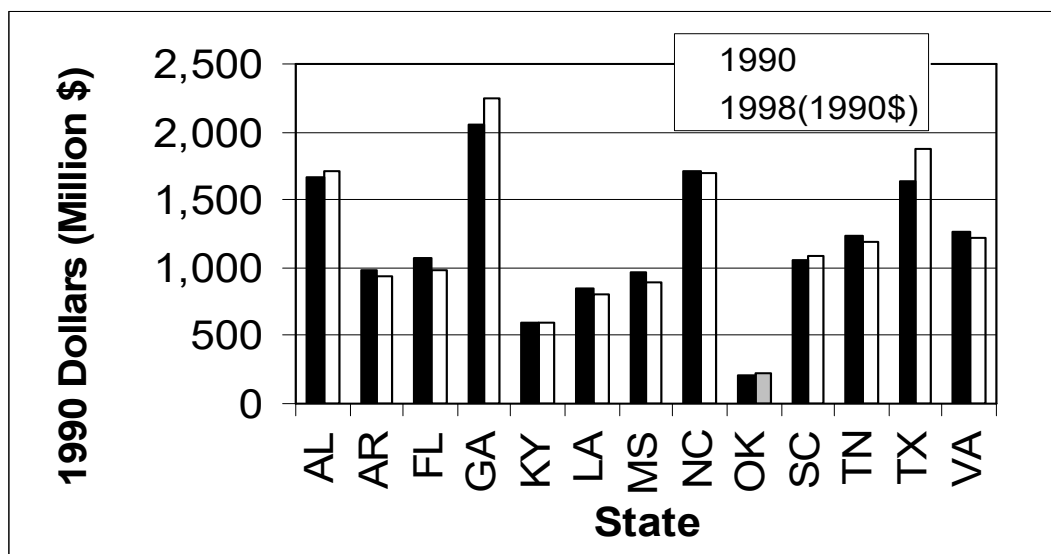
Figure 3. Total southern United States forest-based industry earnings by state from 1990 and 1998 (1990 dollars)
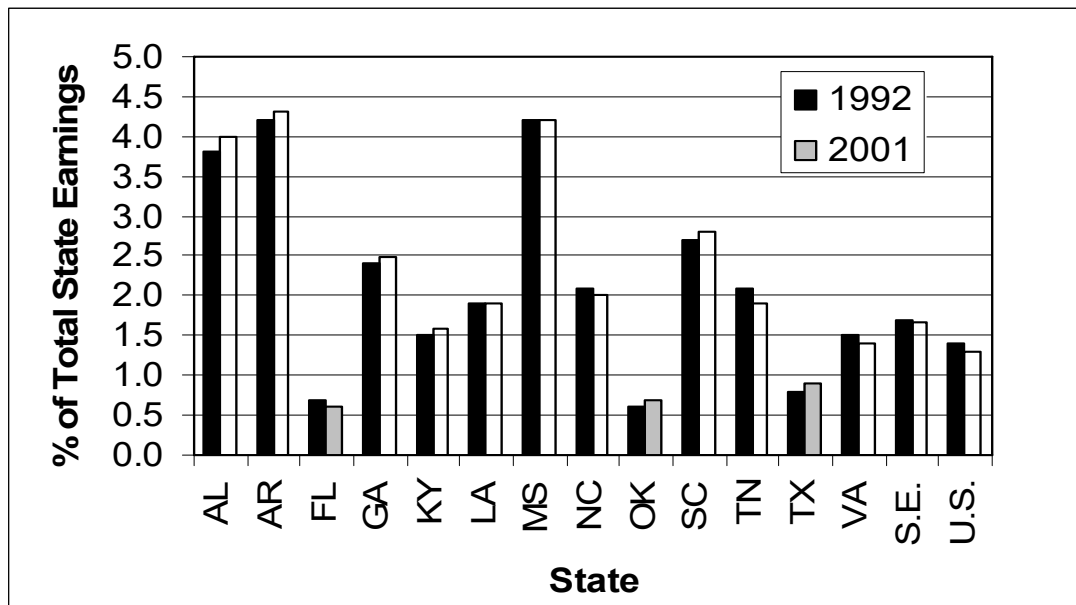
Figure 4. Total forest-based industry earnings as a percentage of total state earnings from 1990 and 1998

Forest-Based Value of Shipments

Value of shipments from southern forest-based industries increased by $27.9 billion in nominal dollars (Table 6 and Table 7) or $2.3 billion in real 1991 dollars for the region and accounted for 40.3% of the total U.S. forest-based value of shipments in 2001 (Table 8). Overall the South saw a decrease in total forest-based manufacturing value of shipments from 7.8 to 7.4%. The South's forest-based value of shipments experienced a real increase of 3.3%.

Table 6.   1991 southern United States forest-based industries (FBI) manufacturing sector value of shipments, value-added, and gross state product (GSP)

State	Value of Shipments			Manufacturing Value Added				Value-added
	All	FBI	%	All	FBI	%	GSP	as % of GSP
Alabama	48,448	8,051	**16.6**	21,056	3,652	**17.3**	74,347	**4.9**
Arkansas	31,084	5,172	**16.6**	12,825	2,261	**17.6**	40,748	**5.5**
Florida	59,275	4,900	**8.3**	29,054	1,928	**6.6**	255,162	**0.8**
Georgia	82,764	10,529	**12.7**	36,576	4,414	**12.1**	143,741	**3.1**
Kentucky	53,500	2,606	**4.9**	23,713	954	**4.0**	70,115	**1.4**
Louisiana	63,381	1,916	**3.0**	22,125	2,220	**10.0**	95,606	**2.3**
Mississippi	31,196	4,833	**15.5**	12,880	1,993	**15.5**	41,704	**4.8**
North Carolina	118,206	7,497	**6.3**	59,914	3,164	**5.3**	147,847	**2.1**
Oklahoma	28,418	1,631	**5.7**	11,958	761	**6.4**	57,983	**1.3**
South Carolina	47,515	5,431	**11.4**	22,490	2,597	**11.5**	66,658	**3.9**
Tennessee	69,549	4,960	**7.1**	32,499	2,219	**6.8**	101,335	**2.2**
Texas	204,001	7,345	**3.6**	77,569	3,081	**4.0**	396,327	**0.8**
Virginia	61,642	5,284	**8.6**	33,245	2,346	**7.1**	174,444	**1.3**
South Total	898,979	70,155	**7.8**	395,904	31,590	**8.0**	1,666,017	**1.9**

Source: Aruna et al. 1997

Table 7.   2001 southern United States forest-based industries (FBI) manufacturing sector value of shipments, value-added, and gross state product (GSP)

State	Value of Shipments			Manufacturing Value Added				Value-added
	All	FBI	%	All	FBI	%	GSP	as % of GSP
Alabama	67,172	9,799	**14.6**	27,844	4,153	**14.9**	120,291	**3.5**
Arkansas	46,530	6,897	**14.8**	19,868	2,601	**13.1**	69,063	**3.8**
Florida	75,541	6,005	**7.9**	39,974	2,620	**6.6**	493,218	**0.5**
Georgia	127,624	14,256	**11.2**	57,578	6,430	**11.2**	296,786	**2.2**
Kentucky	84,180	5,441	**6.5**	31,722	2,365	**7.5**	117,151	**2.0**
Louisiana	85,488	6,138	**7.2**	22,545	2,532	**11.2**	132,899	**1.9**
Mississippi	38,560	5,153	**13.4**	15,573	2,007	**12.9**	66,233	**3.0**
North Carolina	167,124	10,374	**6.2**	91,184	4,205	**4.6**	284,769	**1.5**
Oklahoma	40,063	1,948	**4.9**	18,059	1,012	**5.6**	92,406	**1.1**
South Carolina	78,738	6,875	**8.7**	35,017	3,364	**9.6**	117,757	**2.9**
Tennessee	104,109	6,809	**6.5**	46,349	2,953	**6.4**	180,792	**1.6**
Texas	321,361	10,346	**3.2**	120,086	4,480	**3.7**	744,842	**0.6**
Virginia	92,874	7,982	**8.6**	53,043	3,471	**6.5**	275,725	**1.3**
South Total	1,329,364	98,022	**7.4**	578,842	42,195	**7.3**	2,991,932	**1.4**

Source: U.S. Department of Commerce, 2001 Annual Survey of Manufacturers

Table 8.   2001 southern United States forest-based industries (FBI) manufacturing sector value of shipments, value-added, and gross state product (GSP) expressed in 1991 dollars

State	Value of Shipments			Manufacturing Value Added				Value-added
	All	FBI	%	All	FBI	%	GSP	as % of GSP
Alabama	54,073	7,139	**13.2**	22,415	3,096	**13.8**	96,834	**3.2**
Arkansas	37,038	5,070	**13.7**	15,815	1,957	**12.4**	54,974	**3.6**
Florida	58,394	4,435	**7.6**	30,900	1,952	**6.3**	381,258	**0.5**
Georgia	100,696	10,629	**10.6**	45,429	4,873	**10.7**	234,164	**2.1**
Kentucky	69,028	4,119	**6.0**	26,012	1,804	**6.9**	96,064	**1.9**
Louisiana	68,903	4,624	**6.7**	18,172	1,936	**10.7**	107,117	**1.8**
Mississippi	30,694	3,693	**12.0**	12,396	1,457	**11.8**	52,721	**2.8**
North Carolina	136,373	7,517	**5.5**	74,406	3,063	**4.1**	232,372	**1.3**
Oklahoma	32,691	1,499	**4.6**	14,736	788	**5.3**	75,403	**1.0**
South Carolina	62,045	5,211	**8.4**	27,594	2,588	**9.4**	92,793	**2.8**
Tennessee	82,558	5,080	**6.2**	36,755	2,217	**6.0**	143,368	**1.5**
Texas	264,159	7,621	**2.9**	98,710	3,336	**3.4**	612,260	**0.5**
Virginia	72,628	5,797	**8.0**	41,479	2,548	**6.1**	215,617	**1.2**
South Total	1,064,821	72,428	**6.8**	463,652	31,603	**6.8**	2,396,538	**1.3**

Within the region, each state's forest-based industry value of shipments increased in real 1991 dollars except for Alabama, Arkansas, Florida, Mississippi, Oklahoma, and South Carolina (Figure 5). Kentucky and Louisiana were the only states to experience an increase in forest-based value of shipments as a percentage of total value of shipments (Figure 6). Kentucky, Louisiana, Texas, and Virginia all increased at rates greater than the South wide average.
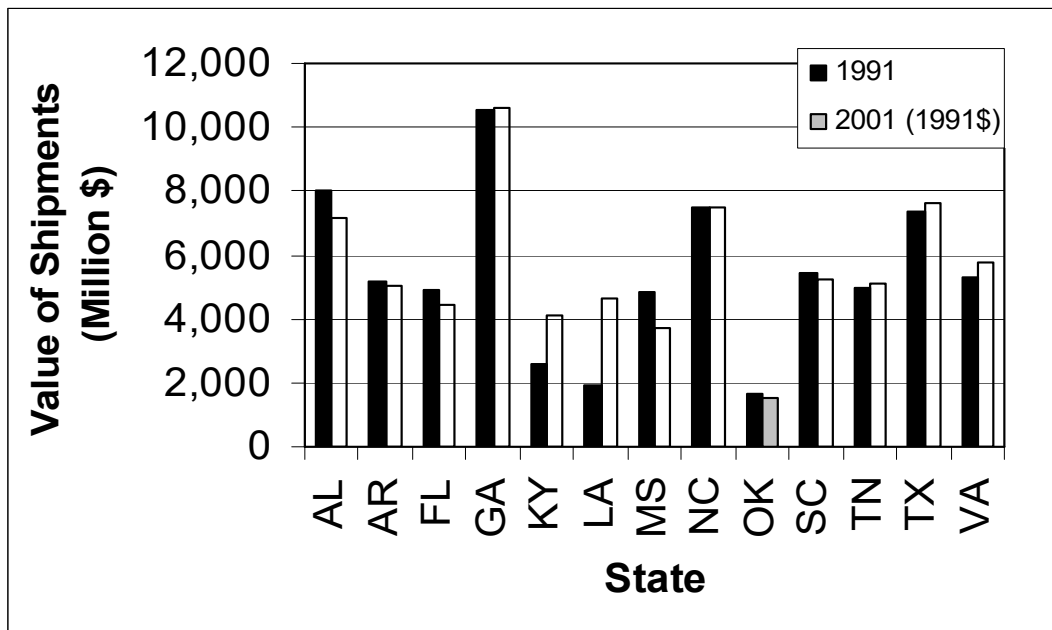
Figure 5. Forest-based industry value of shipments by state for 1991 and 2001 in
1991 dollars
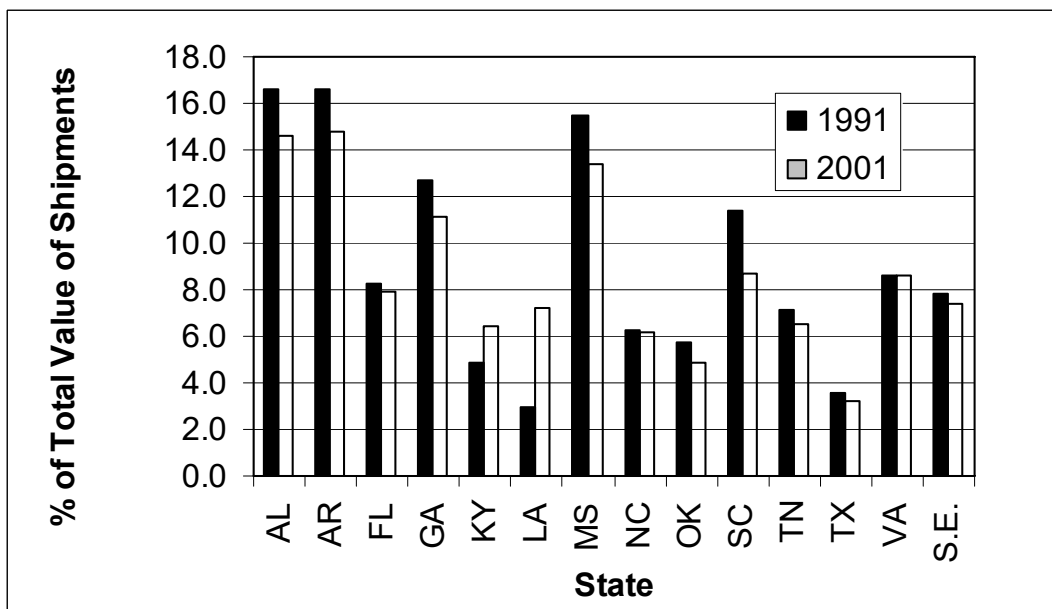
Figure 6. Forest-based industry value of shipments as a percentage of total state
value of shipments for 1991 and 2001

Forest-Based Value-Added

From 1991 to 2001, manufacturing value-added attributed to southern forest-based industry increased $11.9 billion in nominal dollars (Table 6 and Table 7) or a real increase of $1.3 billion (Table 8). The South experienced a real increase of 4.3% in forest-based industry manufacturing value-added. As a percentage of total manufacturing value-added, southern forest-based industry manufacturing value-added decreased from 8.0% in 1991 to 7.3% in 2001.

Forest-based value-added increased in real 1991 dollars in Florida, Georgia, Kentucky, Louisiana, Oklahoma, Texas, Virginia, and the South as a whole (Figure 7). Kentucky and Louisiana were the only two states that experienced a decrease in forest-based industries manufacturing value-added as a percentage of total manufacturing value-added (Figure 8). The increase in forest-based industry manufacturing value-added in Georgia, Kentucky, Louisiana, Texas, and Virginia exceeded the South-wide average. Several states' forest-based value-added changed disproportionately to the change in their value of shipments. Georgia had an increase of 1% in forest-based value of shipments, but forest-based value-added increased 10%. Florida and Oklahoma experienced large decreases in value of shipments 9.5 and 8.3% respectively, but increases in value-added 1.2 and 3.4%. Arkansas experienced decreases in both forest-based value of shipments (2%) and value-added (13.5%).
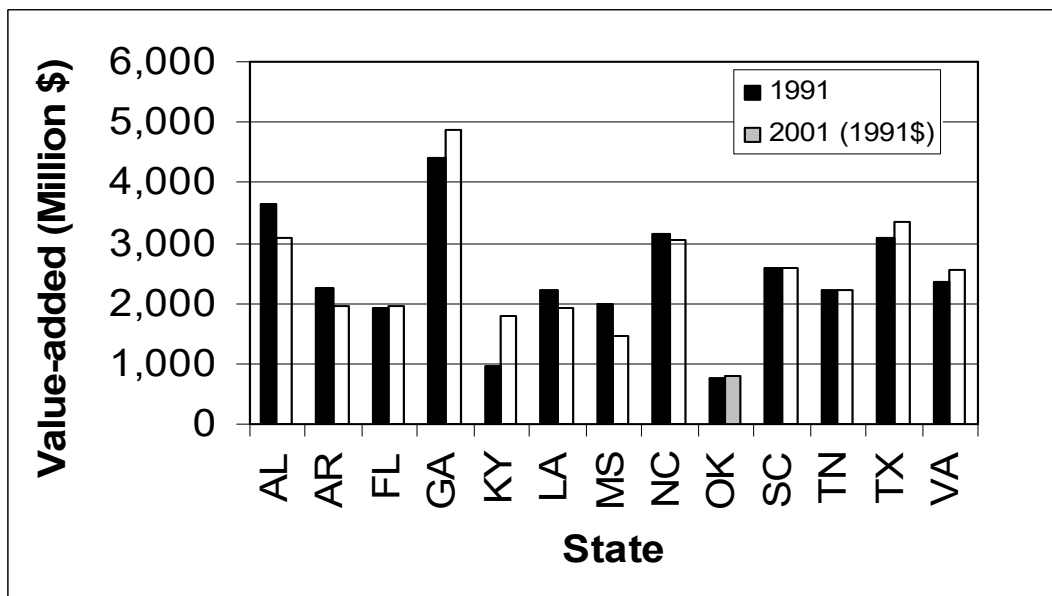
Figure 7. Forest-based industry value-added by state for 1991 and 2001 in 1991 dollars
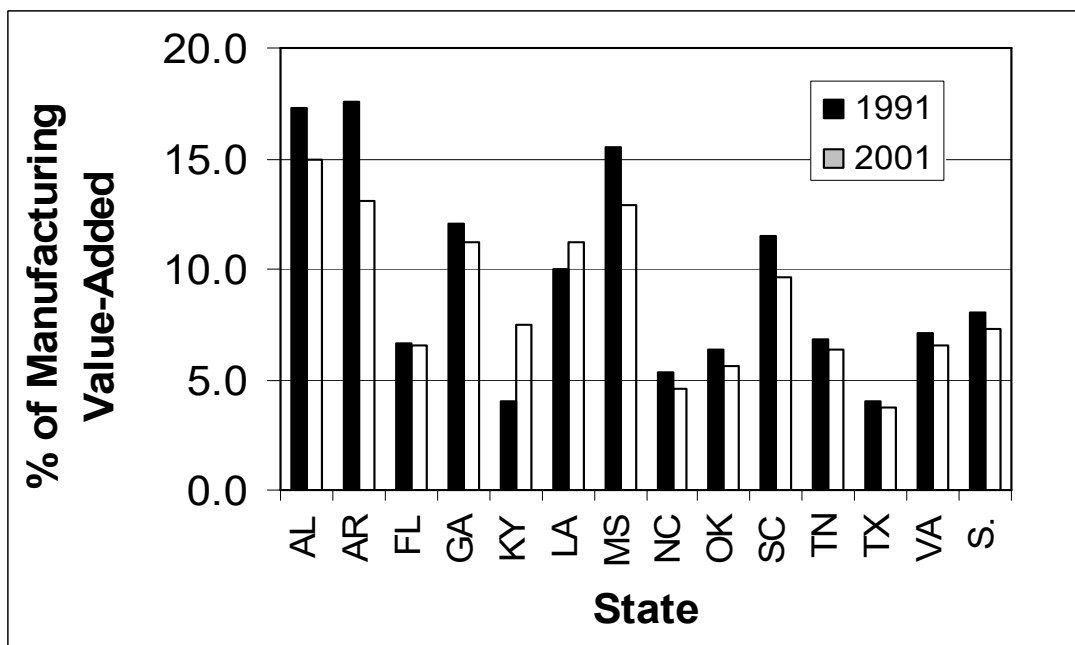
Figure 8. Forest-based industry value-added as a percentage of total state value-added for 1991 and 2001 in real 1991 dollars

Gross Domestic Product (GDP) for the South, according to the U.S. Census Bureau measures the market value of goods and services produced by labor and property located in the area. Forest-based industry manufacturing value-added as a percentage of the South's GDP decreased from 1.9% in 1991 to 1.4% in 2001. Forest-based industries manufacturing value-added decreased as a percentage of GSP in every state except Kentucky.

Forest-Based Industries Relative Rank

Arkansas had the highest overall rank of 1.5, maintaining the highest place, but decreasing from an overall rank of 1.0 (Table 9 and Table 10). Mississippi and Alabama were ranked 2nd and 3rd with scores of 2.3 and 2.5, respectively. These three states held the top three positions in every category except forest-based earnings where North Carolina ranked 3rd and Alabama ranked 4th. The next closest ranking was South Carolina with a score of 5.3, over twice that of Alabama the 3rd ranked state. In 1992, Arkansas ranked 1st in all four categories (tied with Alabama in value of shipments), with Mississippi and Alabama at 2nd and 3rd scoring 2.0 and 2.3, respectively. Georgia was ranked 4th with a score of 4.8, more than twice the 3rd place rank. Overall, there was relatively little change in rankings. Kentucky had the absolute largest change in relative score from 10.3 in 1992 to 8.0 in 2001 and went from 11th place to being tied with South Carolina for 8th place.

Table 9.   Relative rank of each southern state in terms of southern forest-based
employment, earnings, value of shipments, and value-added and average
state rank using Aruna et al. data

State	Rank				
	Employment	Earnings	Value of Shipments	Value-Added	Average Rank
Alabama	3	3	1	2	2.3
Arkansas	1	1	1	1	1.0
Florida	12	12	7	9	10.0
Georgia	6	5	4	4	4.8
Kentucky	9	9	11	12	10.3
Louisiana	10	8	13	6	9.3
Mississippi	1	1	3	3	2.0
North Carolina	4	6	9	11	7.5
Oklahoma	13	13	10	10	11.5
South Carolina	7	4	5	5	5.3
Tennessee	5	6	8	8	6.8
Texas	11	11	12	12	11.5
Virginia	7	9	6	7	7.3

Table 10. Relative rank of each southern state in terms of 2001 southern forest-based
employment, earnings, value of shipments, and value-added and average
state rank

State	Rank				
	Employment	Earnings	Value of Shipments	Value-Added	Average Rank
Alabama	4	3	2	1	2.5
Arkansas	2	1	1	2	1.5
Florida	12	13	7	8	10.0
Georgia	8	5	4	5	5.5
Kentucky	6	9	10	7	8.0
Louisiana	10	7	8	4	7.3
Mississippi	1	2	3	3	2.3
North Carolina	3	6	11	12	8.0
Oklahoma	12	12	12	11	11.8
South Carolina	6	4	5	6	5.3
Tennessee	5	7	9	10	7.8
Texas	11	11	13	13	12.0
Virginia	9	10	6	9	8.5

Forest-Based Tax Contribution

Forest-based industries in the South generated $14.4 billion in federal government, non-defense taxes (Table 11) and $7.2 billion in state and local government, non-education taxes (Table 12) for a combined total of $21.3 billion in 2001 (Table 13). The lumber and wood products sector accounted for $6.3 billion of the region's total forest-based taxes. The paper and allied products and wood furniture sectors produced $8.9 billion and $6.1 billion in total taxes, respectively. The paper and allied products sector ranked highest in both federal government, non-defense and state and local government, non-education taxes generated in the South. The wood furniture sector ranked 2nd in federal, non-defense taxes, but was 3rd in state and local, non-education taxes. The lumber and wood products sector produced the lowest federal, non-defense taxes, but ranked 2nd in state and local, non-education taxes.

The paper and allied products sector produced the most federal government, non-defense and state and local government, non-education taxes in every state except Mississippi, North Carolina, and Virginia. The combined tax in Virginia was highest for the paper and allied products, but the federal government, non-defense tax for wood furniture sector was $3 million higher. The wood furniture sectors in Mississippi and North Carolina accounted for the largest federal government, non-defense and state and local government, non-education tax. The lumber and wood products sector was the second largest tax producer in Alabama, Arkansas, Georgia,

Kentucky, Louisiana, Mississippi, Oklahoma, South Carolina, and the South as a whole.

Forest-based industries in North Carolina generated the most taxes of any southern state with a combined total of $3.4 billion, accounting for 16.2% of the South's total. The combined tax total for Texas and Georgia was $2.7 billion and $2.6 billion, respectively. Tennessee, Virginia, Alabama, and Florida each had combined taxes totaling between $1.5 and $2.0 billion and Mississippi, Arkansas, and South Carolina each totaled between $1.0 and $1.5 billion in taxes. The combined taxes in Kentucky, Louisiana, and Oklahoma were all below $1.0 billion, with Oklahoma's $300 million being the lowest total taxes generated.

Table 11. Federal, non-defense tax impacts generated by the forest-based industries in the South

State	Federal Non-Defense Taxes				
	Corporate Profits Tax	Indirect Business Taxes	Personal Taxes	Social Security Taxes	Total
Alabama					
Lumber and wood products	45,369,457	32,057,246	132,728,052	185,111,307	**395,266,061**
Paper and allied products	86,697,499	39,171,491	177,870,067	261,468,360	**565,207,416**
Wood furniture	21,257,608	13,688,161	70753196	102,548,786	**208,247,752**
Total	**153,324,564**	**84,916,898**	**381,351,315**	**549,128,453**	**1,168,721,229**
Arkansas					
Lumber and wood products	30,077,870	19,712,044	87411915	139,905,123	**277,106,953**
Paper and allied products	46,174,258	20,540,091	102379126	171,521,998	**340,615,473**
Wood furniture	14,342,649	7,550,774	42497850	70,684,133	**135,075,406**
Total	**90,594,777**	**47,802,909**	**232,288,891**	**382,111,254**	**752,797,832**
Florida					
Lumber and wood products	28,008,448	19,120,238	143463528	142,805,477	**333,397,690**
Paper and allied products	36,707,081	22,239,570	170932390	172,347,598	**402,226,638**
Wood furniture	29,171,012	18,108,191	154146242	155,333,654	**356,759,099**
Total	**93,886,541**	**59,467,999**	**468,542,160**	**470,486,729**	**1,092,383,427**
Georgia					
Lumber and wood products	51,327,469	43,275,525	188754692	205,482,404	**488,840,089**
Paper and allied products	114,556,936	75,781,233	352509872	390,642,601	**933,490,642**
Wood furniture	28,602,844	22,445,064	111807813	123,119,235	**285,974,956**
Total	**194,487,249**	**141,501,822**	**653,072,377**	**719,244,240**	**1,708,305,687**
Kentucky					
Lumber and wood products	17,850,891	18,404,450	65507496	93,177,663	**194,940,499**
Paper and allied products	28,362,065	20,172,410	79620653	116,936,567	**245,091,696**
Wood furniture	12,254,614	8,737,772	40668982	57,131,716	**118,793,083**
Total	**58,467,570**	**47,314,632**	**185,797,131**	**267,245,946**	**558,825,278**
Louisiana					
Lumber and wood products	23,986,510	12,350,306	70858527	85,897,252	**193,092,595**
Paper and allied products	45,266,083	16,622,132	102821373	129,845,989	**294,555,577**
Wood furniture	2,090,118	1,093,795	7032578	8,649,080	**18,865,570**
Total	**71,342,711**	**30,066,233**	**180,712,478**	**224,392,321**	**506,513,742**

Table 11. (Continued)

State	Federal Non-Defense Taxes				
	Corporate Profits Tax	Indirect Business Taxes	Personal Taxes	Social Security Taxes	Total
Mississippi					
Lumber and wood products	36,106,151	17,074,269	88322881	147,667,119	**289,170,420**
Paper and allied products	28,293,271	10,263,067	59184223	103,906,908	**201,647,470**
Wood furniture	27,224,790	16,166,402	111030793	193,555,019	**347,977,004**
Total	**91,624,212**	**43,503,738**	**258,537,897**	**445,129,046**	**838,794,894**
North Carolina					
Lumber and wood products	49,154,052	49,661,619	170383002	220,326,758	**489,525,430**
Paper and allied products	69,876,186	57,812,966	209194005	275,482,945	**612,366,103**
Wood furniture	99,563,104	98,516,540	412169520	543,556,382	**1,153,805,546**
Total	**218,593,342**	**205,991,125**	**791,746,527**	**1,039,366,085**	**2,255,697,079**
Oklahoma					
Lumber and wood products	6,529,314	5,439,951	21239407	30,682,198	**63,890,869**
Paper and allied products	9,938,289	5,874,206	23406010	34,956,715	**74,175,220**
Wood furniture	5,327,868	3,699,863	16842601	25,269,540	**51,139,873**
Total	**21,795,471**	**15,014,020**	**61,488,018**	**90,908,453**	**189,205,962**
South Carolina					
Lumber and wood products	23,281,132	13,610,690	64981039	88,122,583	**189,995,444**
Paper and allied products	52,798,715	23,863,195	132834031	185,345,184	**394,841,125**
Wood furniture	8,532,764	4,943,861	29686324	41,236,844	**84,399,793**
Total	**84,612,611**	**42,417,746**	**227,501,394**	**314,704,611**	**669,236,362**
Tennessee					
Lumber and wood products	23,630,111	17,653,928	96681784	122,276,241	**260,242,064**
Paper and allied products	81,290,388	38,681,686	221730347	297,341,181	**639,043,601**
Wood furniture	38,730,975	23,056,504	146343822	192,633,965	**400,765,268**
Total	**143,651,474**	**79,392,118**	**464,755,953**	**612,251,387**	**1,300,050,933**
Texas					
Lumber and wood products	47,916,771	40,211,223	205761681	210,017,486	**503,907,162**
Paper and allied products	85,515,269	59,594,193	306595265	322,594,634	**774,299,360**
Wood furniture	52,229,961	38,398,431	223345329	235,958,556	**549,932,278**
Total	**185,662,001**	**138,203,847**	**735,702,275**	**768,570,676**	**1,828,138,800**

Table 11. (Continued)

State	Federal Non-Defense Taxes				
	Corporate Profits Tax	Indirect Business Taxes	Personal Taxes	Social Security Taxes	Total
Virginia					
Lumber and wood products	33,851,709	31,244,663	147816294	137,262,840	**350,175,505**
Paper and allied products	51,668,045	34,250,953	178388627	166,576,218	**430,883,844**
Wood furniture	40,738,148	32,370,592	184856783	175,839,058	**433,804,582**
Total	**126,257,902**	**97,866,208**	**511,061,704**	**479,678,116**	**1,214,863,931**
South					
Lumber and wood products	417,089,885	319,816,152	1,483,910,298	1,808,734,451	**4,029,550,781**
Paper and allied products	737,144,085	424,867,193	2,117,465,989	2,628,966,898	**5,908,444,165**
Wood furniture	380,066,455	288,775,950	1,551,181,833	1,925,515,968	**4,145,540,210**
Total	**1,534,300,425**	**1,033,459,295**	**5,152,558,120**	**6,363,217,317**	**14,083,535,156**

Source: 2001 IMPLAN Database.

Table 12. State and local government, non-education taxes generated by the forest-based industries in the South

State	State and Local Government, Non-Education Taxes					
	Corporate Profits Tax	Dividends	Indirect Business Taxes	Personal Taxes	Security Taxes	Total
Alabama						
Lumber and wood products	3,683,994	111,013	178,694,366	40,233,571	1,999,877	**226,532,095**
Paper and allied products	7,039,826	212,137	218,350,778	53,917,120	2,922,684	**284,653,341**
Wood furniture	1,726,115	52,015	76,300,919	21447192	1,136,182	**101,434,966**
Total	**12,449,935**	**375,165**	**473,346,063**	**115,597,883**	**6,058,743**	**612,620,402**
Arkansas						
Lumber and wood products	4,345,910	73,085	129,498,141	29098184	1,606,955	**165,756,443**
Paper and allied products	6,671,656	112,198	134,937,984	34080480	2,024,647	**179,008,774**
Wood furniture	2,072,350	34,851	49,604,757	14146903	830,853	**67,124,161**
Total	**13,089,916**	**220,134**	**314,040,882**	**77,325,567**	**4,462,455**	**411,889,378**
Florida						
Lumber and wood products	4,308,870	65,735	144,376,538	8182504	1,498,712	**159,587,272**
Paper and allied products	5,647,083	86,150	167,930,546	9749182	1,824,573	**186,580,863**
Wood furniture	4,487,721	68,463	136,734,597	8791780	1,643,823	**152,820,165**
Total	**14,443,674**	**220,348**	**449,041,681**	**26,723,466**	**4,967,108**	**498,988,300**
Georgia						
Lumber and wood products	5,304,029	94,072	219,929,557	54921895	1,588,312	**281,837,867**
Paper and allied products	11,837,976	209,958	385,126,078	102569447	3,059,379	**502,802,839**
Wood furniture	2,955,734	52,423	114,067,548	32532637	959,780	**150,568,121**
Total	**20,097,739**	**356,453**	**719,123,183**	**190,023,979**	**5,607,471**	**935,208,827**
Kentucky						
Lumber and wood products	2,792,620	43,759	86,274,784	28036851	1,398,826	**119,428,187**
Paper and allied products	4,437,004	69,526	94,562,484	34077091	1,794,037	**135,906,152**
Wood furniture	1,917,130	30,040	40,960,166	17406125	850,203	**61,582,095**
Total	**9,146,754**	**143,325**	**221,797,434**	**79,520,067**	**4,043,066**	**316,916,434**
Louisiana						
Lumber and wood products	2,829,257	59,016	98,966,771	14512893	1,458,330	**118,162,151**
Paper and allied products	5,339,225	111,372	133,198,217	21059315	2,280,706	**162,440,896**
Wood furniture	246,534	5,143	8,764,907	1440376	148,657	**10,635,364**
Total	**8,415,016**	**175,531**	**240,929,895**	**37,012,584**	**3,887,693**	**291,238,411**

Table 12. (Continued)

State	State and Local Government, Non-Education Taxes					
	Corporate Profits Tax	Dividends	Indirect Business Taxes	Personal Taxes	Security Taxes	Total
Mississippi						
Lumber and wood products	5,950,836	112,645	141,788,192	24583363	3,639,847	**177,304,214**
Paper and allied products	4,663,156	88,270	85,226,587	16472994	2,640,010	**109,829,949**
Wood furniture	4,487,054	84,936	134,249,076	30903685	4,896,901	**175,785,618**
Total	**15,101,046**	**285,851**	**361,263,855**	**71,960,042**	**11,176,758**	**462,919,781**
North Carolina						
Lumber and wood products	6,374,201	66,915	201,192,320	65936258	2,456,966	**278,493,760**
Paper and allied products	9,061,407	95,125	234,215,576	80955504	3,109,053	**330,308,710**
Wood furniture	12,911,149	135,539	399,116,491	159504501	6,140,187	**582,701,995**
Total	**28,346,757**	**297,579**	**834,524,387**	**306,396,263**	**11,706,206**	**1,191,504,465**
Oklahoma						
Lumber and wood products	536,819	12,002	29,676,400	8069743	518,742	**39,695,189**
Paper and allied products	817,094	18,269	32,045,374	8892920	604,764	**43,330,270**
Wood furniture	438,040	9,794	20,183,755	6399206	438,512	**28,068,827**
Total	**1,791,953**	**40,065**	**81,905,529**	**23,361,869**	**1,562,018**	**111,094,286**
South Carolina						
Lumber and wood products	1,936,178	42,091	88,037,583	22952789	846,618	**114,981,818**
Paper and allied products	4,391,011	95,456	154,353,528	46919851	4,316,935	**210,076,782**
Wood furniture	709,628	15,427	31,978,211	10485856	957,606	**44,146,730**
Total	**7,036,817**	**152,974**	**274,369,322**	**80,358,496**	**6,121,159**	**369,205,330**
Tennessee						
Lumber and wood products	3,944,492	32,921	117,519,083	6035307	652,090	**129,183,242**
Paper and allied products	13,569,520	113,251	257,497,163	13841398	1,648,006	**288,859,021**
Wood furniture	6,465,226	53,959	153,483,084	9135433	1,055,113	**171,497,994**
Total	**23,979,238**	**200,131**	**528,499,330**	**29,012,138**	**3,355,209**	**589,540,257**
Texas						
Lumber and wood products	0	89,090	226,683,399	12236933	2,532,446	**241,541,868**
Paper and allied products	0	158,995	335,951,340	18233567	3,977,145	**358,321,046**
Wood furniture	0	97,109	216,464,117	13282591	2,917,435	**232,761,252**
Total	**0**	**345,194**	**779,098,856**	**43,753,091**	**9,427,026**	**832,624,166**

Table 12. (Continued)

State	State and Local Government, Non-Education Taxes					
	Corporate Profits Tax	Dividends	Indirect Business Taxes	Personal Taxes	Security Taxes	Total
Virginia						
Lumber and wood products	2,455,045	74,751	139,187,547	44246614	1,453,723	**188,909,656**
Paper and allied products	3,747,148	114,093	152,579,856	53397943	1,772,316	**213,246,888**
Wood furniture	2,954,474	89,957	144,203,298	55333931	1,899,115	**206,026,519**
Total	**9,156,667**	**278,801**	**435,970,701**	**152,978,488**	**5,125,154**	**608,183,063**
South						
Lumber and wood products	44,462,251	877,095	1,801,824,681	359,046,905	21,651,444	**2,241,413,762**
Paper and allied products	77,222,106	1,484,800	2,385,975,511	494,166,812	31,974,255	**3,005,365,531**
Wood furniture	41,371,155	729,656	1,526,110,926	380,810,216	23,874,367	**1,985,153,807**
Total	**163,055,512**	**3,091,551**	**5,713,911,118**	**1,234,023,933**	**77,500,066**	**7,231,933,100**

Source: 2001 IMPLAN Database.

Table 13. Combined 2001 federal, non-defense taxes and state and local government taxes generated by the forest-based industries in the South

State (2001 Dollars)	Total Federal Non-Defense Taxes (Table 11)	Total State and Local Non-Education Taxes (Table 12)	Combined Total: Federal, State, and Local Taxes
Alabama			
Lumber and wood products	395,266,061	226,532,095	**621,798,156**
Paper and allied products	565,207,416	284,653,341	**849,860,756**
Wood furniture	208,247,752	101,434,966	**309,682,718**
Total	**1,168,721,229**	**612,620,402**	**1,781,341,630**
Arkansas			
Lumber and wood products	277,106,953	165,756,443	**442,863,396**
Paper and allied products	340,615,473	179,008,774	**519,624,247**
Wood furniture	135,075,406	67,124,161	**202,199,567**
Total	**752,797,832**	**411,889,378**	**1,164,687,210**
Florida			
Lumber and wood products	333,397,690	159,587,272	**492,984,962**
Paper and allied products	402,226,638	186,580,863	**588,807,501**
Wood furniture	356,759,099	152,820,165	**509,579,264**
Total	**1,092,383,427**	**498,988,300**	**1,591,371,727**
Georgia			
Lumber and wood products	488,840,089	281,837,867	**770,677,956**
Paper and allied products	933,490,642	502,802,839	**1,436,293,481**
Wood furniture	285,974,956	150,568,121	**436,543,077**
Total	**1,708,305,687**	**935,208,827**	**2,643,514,514**
Kentucky			
Lumber and wood products	194,940,499	119,428,187	**314,368,686**
Paper and allied products	245,091,696	135,906,152	**380,997,848**
Wood furniture	118,793,083	61,582,095	**180,375,178**
Total	**558,825,278**	**316,916,434**	**875,741,712**

Table 13.   (Continued)

State (2001 Dollars)	Total Federal Non-Defense Taxes (Table 11)	Total State and Local Non-Education Taxes (Table 12)	Combined Total: Federal, State, and Local Taxes
Louisiana			
Lumber and wood products	193,092,595	118,162,151	**311,254,746**
Paper and allied products	294,555,577	162,440,896	**456,996,473**
Wood furniture	18,865,570	10,635,364	**29,500,934**
Total	**506,513,742**	**291,238,411**	**797,752,153**
Mississippi			
Lumber and wood products	289,170,420	177,304,214	**466,474,634**
Paper and allied products	201,647,470	109,829,949	**311,477,419**
Wood furniture	347,977,004	175,785,618	**523,762,622**
Total	**838,794,894**	**462,919,781**	**1,301,714,675**
North Carolina			
Lumber and wood products	489,525,430	278,493,760	**768,019,190**
Paper and allied products	612,366,103	330,308,710	**942,674,813**
Wood furniture	1,153,805,546	582,701,995	**1,736,507,542**
Total	**2,255,697,079**	**1,191,504,465**	**3,447,201,545**
Oklahoma			
Lumber and wood products	63,890,869	39,695,189	**103,586,058**
Paper and allied products	74,175,220	43,330,270	**117,505,490**
Wood furniture	51,139,873	28,068,827	**79,208,700**
Total	**189,205,962**	**111,094,286**	**300,300,248**
South Carolina			
Lumber and wood products	189,995,444	114,981,818	**304,977,262**
Paper and allied products	394,841,125	210,076,782	**604,917,907**
Wood furniture	84,399,793	44,146,730	**128,546,523**
Total	**669,236,362**	**369,205,330**	**1,038,441,692**

Table 13.   (Continued)

State (2001 Dollars)	Total Federal Non-Defense Taxes (Table 11)	Total State and Local Non-Education Taxes (Table 12)	Combined Total: Federal, State, and Local Taxes
Tennessee			
Lumber and wood products	260,242,064	129,183,242	**389,425,306**
Paper and allied products	639,043,601	288,859,021	**927,902,623**
Wood furniture	400,765,268	171,497,994	**572,263,262**
Total	**1,300,050,933**	**589,540,257**	**1,889,591,191**
Texas			
Lumber and wood products	503,907,162	241,541,868	**745,449,031**
Paper and allied products	774,299,360	358,321,046	**1,132,620,406**
Wood furniture	549,932,278	232,761,252	**782,693,530**
Total	**1,828,138,800**	**832,624,166**	**2,660,762,967**
Virginia			
Lumber and wood products	350,175,505	188,909,656	**539,085,161**
Paper and allied products	430,883,844	213,246,888	**644,130,732**
Wood furniture	433,804,582	206,026,519	**639,831,100**
Total	**1,214,863,931**	**608,183,063**	**1,823,046,993**
South			
Lumber and wood products	4,029,550,781	2,241,413,762	**6,270,964,544**
Paper and allied products	5,908,444,165	3,005,365,531	**8,913,809,696**
Wood furniture	4,145,540,210	1,985,153,807	**6,130,694,017**
Total	**14,083,535,156**	**7,231,933,100**	**21,315,468,257**

Source: 2001 IMPLAN Database.

Forest-Based Industries Multipliers

Type III output multipliers for the three manufacturing sectors that compose

the forest-based industries, lumber and wood products, wood furniture, and paper and

allied products for each of the 13 states were computed using IMPLAN. In 1992,

lumber and wood products multipliers ranged from 1.95 (South Carolina) to 2.25 (Tennessee) and shifted in 2001 to 2.02 (South Carolina) to 2.28 (Tennessee) (Table 14). Although the range shifted upward, the lumber and wood products output multipliers decreased for Alabama, Arkansas, Kentucky, Oklahoma, and Texas. In 1992, the average lumber and wood products multiplier was 2.161, but decreased to 2.156 in 2001. In 1992, the wood furniture output multipliers ranged from 1.96 (Arkansas) and 2.25 (Tennessee) and shifted upward in 2001 to 2.06 (Kentucky) and 2.42 (Florida). In 1992, the average wood multiplier was 2.142 and increased to 2.224 by 2001, but Georgia, Kentucky, South Carolina, and Virginia all had decreases in wood furniture output multipliers. From 1992 to 2001, the range of the paper and allied products output multipliers shifted from 1.50 (Oklahoma) and 1.76 (Louisiana) to 1.57 (South Carolina) and 1.83 (Florida). The average paper and allied products multiplier slightly increased from 1.647 to 1.681. Alabama, Arkansas, Louisiana, Mississippi, and South Carolina experienced a decrease in paper and allied products output multipliers. As in 1992, the output multipliers for the lumber and wood products and wood furniture sectors were noticeably higher than those for the paper and allied products sector. Higher output multipliers indicated a greater importance to the economy because more of the industries inputs were obtained from or purchased in the region.

Table 14. Forest-based industry output multipliers (aggregated) for the southern
United States by state and sector

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Alabama	Lumber and wood products	1.5868	2.1168	1.5904	2.1314
	Furniture	1.4886	2.1666	1.4517	2.1685
	Paper and allied products	1.432	1.7086	1.3316	1.5879
Arkansas	Lumber and wood products	1.6192	2.2176	1.604	2.1419
	Furniture	1.3675	1.9644	1.4619	2.1068
	Paper and allied products	1.3344	1.6324	1.337	1.6224
Florida	Lumber and wood products	1.4071	2.1399	1.438345	2.275487
	Furniture	1.3417	22,357	1.392236	2.4157
	Paper and allied products	1.3206	1.6632	1.360431	1.832116
Georgia	Lumber and wood products	1.6125	2.1659	1.594751	2.225625
	Furniture	1.55	2.3471	1.534733	2.327703
	Paper and allied products	1.3979	1.6889	1.397813	1.750043
Kentucky	Lumber and wood products	1.5301	2.2455	1.57656	2.211876
	Furniture	1.3696	2.1207	1.410311	2.067967
	Paper and allied products	1.2886	1.6107	1.328582	1.645276
Louisiana	Lumber and wood products	1.6224	2.1413	1.549061	2.085266
	Furniture	1.4855	2.2141	1.430012	2.277306
	Paper and allied products	1.4373	1.7601	1.351704	1.641304
Mississippi	Lumber and wood products	1.6709	2.1938	1.575221	2.057592
	Furniture	1.4685	2.1063	1.493273	2.135665
	Paper and allied products	1.3598	1.6384	1.325457	1.575701
North Carolina	Lumber and wood products	1.5844	2.155	1.581975	2.181574
	Furniture	1.5015	2.1622	1.524713	2.296733
	Paper and allied products	1.3582	1.6324	1.370069	1.70469
Oklahoma	Lumber and wood products	1.5043	2.2173	1.516543	2.155454
	Furniture	1.3087	2.0682	1.426643	2.252665
	Paper and allied products	1.2586	1.5048	1.370484	1.745347
South Carolina	Lumber and wood products	1.5439	1.9589	1.545348	2.024649
	Furniture	1.4792	2.0831	1.455607	2.097787
	Paper and allied products	1.3484	1.5844	1.307168	1.568669

Table 14. (Continued)

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Tennessee	Lumber and wood products	1.4783	2.2562	1.5691	2.2892
	Furniture	1.3790	2.0585	1.5061	2.3019
	Paper and allied products	1.3463	1.6706	1.3571	1.7071
Texas	Lumber and wood products	1.5454	2.2256	1.5121	2.1652
	Furniture	1.3981	2.0703	1.4651	2.2699
	Paper and allied products	1.3769	1.6995	1.4259	1.8178
Virginia	Lumber and wood products	1.5241	2.0580	1.5091	2.0892
	Furniture	1.5282	2.2514	1.4493	2.1948
	Paper and allied products	1.3397	1.6171	1.3436	1.6585

Source: Aruna et al. (1997) and 2001 IMPLAN Database.

In 1992, employment multipliers from the lumber and wood products sector ranged from 2.37 (Tennessee) to 2.86 (Louisiana) with an increase in 2001 in the lower end of the range to 2.44 (Texas), but a decrease in the upper end on the range to 2.81 (Oklahoma) (Table 15). From 1992 to 2001, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, and Texas all experienced a decrease in lumber and wood products employment multipliers. Overall, there was little change with the average multiplier increasing from 2.624 to 2.661. In 2001, the lower end of the wood furniture employment multipliers decreased from 2.09 (South Carolina) to 2.06 (Louisiana), while the upper end remained the same at 2.36 (Florida). Wood furniture employment multipliers in Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Texas, and Virginia decreased between 1992 and 2001 and the average multiplier also decreased from 2.263 to 2.192. In 1992, the range for the paper and allied products sector employment multipliers was 2.55 (Mississippi) to 3.31 (Florida)

and moved in 2001 to 2.58 (Kentucky) to 3.26 (Florida). Florida, Georgia, and Texas were the only states to have a decrease in paper and allied products employment multipliers, with the average multiplier increasing from 2.840 to 2.917. Employment multipliers for the paper and allied products sector were the highest of the three sectors for every state indicating that changes in this sector would have a greater impact on employment.

The range of the Type III value-added economic multipliers shifted upward for all three sectors of the forest-based industries (Table 16). From 1992 to 2001, the lumber and wood products value-added multipliers shifted from a range of 2.45 (South Carolina) and 2.90 (Oklahoma) to a range of 2.52 (South Carolina) and 2.95 (Florida), with the average multiplier increasing from 2.738 to 2.806. Lumber and wood products multipliers decreased in Alabama, Arkansas, Louisiana, and Mississippi. During the same time frame, the wood furniture value-added multipliers went from 2.28 (Oklahoma) and 2.86 (Florida) to 2.52 (South Carolina) and 3.21 (Tennessee), with the average multiplier increasing from 2.536 to 2.610. Arkansas, Florida, Kentucky, and Virginia experienced decreases in wood furniture value-added multipliers. From 1992 to 2001, the paper and allied products value-added multipliers moved from 1.73 (Oklahoma) and 2.06 (Texas) to 1.88 (Alabama) and 2.56 (Florida), with the average multiplier increased from 1.949 to 2.139. Alabama and Louisiana were the only two states to have decreases in paper and allied products multipliers. Value-added multipliers were notably higher for the lumber and wood products and wood furniture sectors than the paper and allied products sector.

Table 15. Forest-based industry employment multipliers (aggregated) for the southern United States by state and sector

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Alabama	Lumber and wood products	1.6564	2.6546	1.7254	2.7654
	Furniture	1.3935	2.2331	1.3409	2.1491
	Paper and allied products	1.9550	3.0918	1.9984	3.2028
Arkansas	Lumber and wood products	1.6895	2.7830	1.7420	2.7648
	Furniture	1.4228	2.3437	1.3800	2.1903
	Paper and allied products	1.6942	2.7907	1.7735	2.8149
Florida	Lumber and wood products	1.4633	2.6181	1.5070	2.7171
	Furniture	1.3234	2.3677	1.3070	2.3566
	Paper and allied products	1.8687	3.3106	1.8082	3.2602
Georgia	Lumber and wood products	1.7076	2.7291	1.6645	2.6490
	Furniture	1.3994	2.2365	1.3968	2.2230
	Paper and allied products	1.9495	3.0754	1.8348	2.9200
Kentucky	Lumber and wood products	1.5427	2.6191	1.6267	2.5730
	Furniture	1.3387	2.2728	1.3406	2.1204
	Paper and allied products	1.5242	2.5692	1.6293	2.5771
Louisiana	Lumber and wood products	1.7368	2.8641	1.6782	2.7440
	Furniture	1.3869	2.3013	1.2744	2.0837
	Paper and allied products	1.7637	2.9084	1.9233	3.1447
Mississippi	Lumber and wood products	1.7386	2.7269	1.7205	2.6750
	Furniture	1.3893	2.1790	1.3908	2.1623
	Paper and allied products	1.6475	2.5542	1.8279	2.8419
North Carolina	Lumber and wood products	1.6233	2.5403	1.6857	2.6954
	Furniture	1.4382	2.2507	1.3993	2.2375
	Paper and allied products	1.7704	2.7391	1.8166	2.9048
Oklahoma	Lumber and wood products	1.5409	2.6197	1.6526	2.8149
	Furniture	1.3000	2.2102	1.3389	2.2805
	Paper and allied products	1.8330	3.0396	1.7878	3.0452
South Carolina	Lumber and wood products	1.6346	2.5333	1.6645	2.5893
	Furniture	1.3511	2.0940	1.3451	2.0925
	Paper and allied products	1.6847	2.5831	1.7182	2.6729

Table 15. (Continued)

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Tennessee	Lumber and wood products	1.4425	2.3732	1.6163	2.6218
	Furniture	1.4019	2.3064	1.4236	2.3093
	Paper and allied products	1.7060	2.7638	1.8439	2.9911
Texas	Lumber and wood products	1.5466	2.5239	1.5317	2.4407
	Furniture	1.4441	2.3567	1.3303	2.1197
	Paper and allied products	1.7477	2.8104	1.6853	2.6855
Virginia	Lumber and wood products	1.5850	2.5251	1.5741	2.5461
	Furniture	1.4239	2.2685	1.3438	2.1736
	Paper and allied products	1.7029	2.6786	1.7674	2.8587

Source: Aruna et al. (1997) and 2001 IMPLAN Database.

From 1992 to 2001, total income multipliers for the lumber and wood products sector increased on the lower end from 2.41 (South Carolina) to 2.43 (South Carolina), but the upper end decreased from 2.84 (Kentucky) to 2.77 (Tennessee) (Table 17). The average multiplier decreased from 2.653 to 2.588 and every state, but Florida, South Carolina, Tennessee, and Virginia had a decrease in total income multipliers for the lumber and wood products sector. Over this same time period, there was a downward shift in the range of total income multipliers for the wood furniture sector from 2.15 (Oklahoma) and 2.68 (Florida) to 2.01 (Kentucky) and 2.52 (Florida). North Carolina, Oklahoma, and Tennessee were the only states to have an increase in wood furniture total income multipliers and the average multiplier decreased from 2.399 to 2.285. The paper and allied products sector multiplier increased in every state and went from a range of 1.66 (Oklahoma) and 2.00 (Texas) to a range of 1.86 (South Carolina) and 2.28 (Oklahoma) and was the only total income Type III multiplier to increase, from 1.888 to 2.126.

Table 16. Forest-based industry value-added multipliers (aggregated) for the
southern United States by state and sector

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Alabama	Lumber and wood products	1.7477	2.7556	1.7655	2.6667
	Furniture	1.5415	2.5561	1.4833	2.4116
	Paper and allied products	1.5159	1.9539	1.4672	1.8819
Arkansas	Lumber and wood products	1.7417	2.7644	1.8036	2.7392
	Furniture	1.4518	2.3820	1.4979	2.3481
	Paper and allied products	1.4359	1.9329	1.4758	1.9433
Florida	Lumber and wood products	1.5412	2.8416	1.6202	2.9845
	Furniture	1.4649	2.8663	1.4885	2.8596
	Paper and allied products	1.4417	2.0316	1.6595	2.5643
Georgia	Lumber and wood products	1.7857	2.7554	1.8175	2.8655
	Furniture	1.6471	2.8144	1.6743	2.8108
	Paper and allied products	1.5418	2.0301	1.6458	2.2627
Kentucky	Lumber and wood products	1.6526	2.8587	1.8490	3.1004
	Furniture	1.3899	2.3814	1.4082	2.2002
	Paper and allied products	1.3742	1.9087	1.4990	2.0465
Louisiana	Lumber and wood products	1.7710	2.7303	1.6991	2.5587
	Furniture	1.5379	2.6072	1.5321	2.7417
	Paper and allied products	1.5332	2.0565	1.5236	2.0173
Mississippi	Lumber and wood products	1.8452	2.8240	1.7308	2.5334
	Furniture	1.5152	2.4567	1.6172	2.6090
	Paper and allied products	1.4312	1.8689	1.4702	1.8974
North Carolina	Lumber and wood products	1.7295	2.7187	1.8082	2.8674
	Furniture	1.5381	2.4601	1.6628	2.8205
	Paper and allied products	1.5081	1.9979	1.6513	2.3052
Oklahoma	Lumber and wood products	1.6717	2.9073	1.7343	2.8448
	Furniture	1.3321	2.2861	1.5162	2.6428
	Paper and allied products	1.3434	1.7353	1.6090	2.2736
South Carolina	Lumber and wood products	1.6831	2.4504	1.7079	2.5184
	Furniture	1.5137	2.4009	1.5185	2.4123
	Paper and allied products	1.4469	1.8412	1.4500	1.8876

Table 16. (Continued)

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Tennessee	Lumber and wood products	1.5836	2.7751	1.8529	3.2133
	Furniture	1.4734	2.4627	1.6334	2.7991
	Paper and allied products	1.4412	1.9490	1.5775	2.1943
Texas	Lumber and wood products	1.6632	2.6861	1.7173	2.7705
	Furniture	1.5440	2.5706	1.5706	2.6425
	Paper and allied products	1.5274	2.0641	1.6966	2.3849
Virginia	Lumber and wood products	1.6461	2.5216	1.7439	2.8159
	Furniture	1.6360	2.7291	1.5584	2.6316
	Paper and allied products	1.4784	1.9604	1.5753	2.1477

Source: Aruna et al. (1997) and 2001 IMPLAN Database.

From 1992 to 2001, the personal income multiplier increased at the lower end
of the range, but decreased for the upper end of the range for both the lumber and
wood products and wood furniture sectors with changes from a range of 2.39 (South
Carolina) and 3.01 (Kentucky) to a range of 2.52 (South Carolina) and 2.95 (Florida)
and from a range of 1.87 (Oklahoma) and 2.58 (Florida) to a range of 1.96
(Mississippi) and 2.41 (Florida), respectively (Table 18). The average multiplier also
decreased for both lumber and wood products (2.628 to 2.563) and wood furniture
(2.188 to 2.171). Arkansas, South Carolina, Tennessee, and Virginia were the only
states to have increases in lumber and wood products personal income multipliers,
while Louisiana, North Carolina, Oklahoma, and Tennessee had increases in wood
furniture sector personal income multipliers. Between 1992 and 2001, the paper and
allied products sector personal income multipliers shifted from a range of 1.69
(Mississippi) and 2.21 (Florida) to a range of 1.80 (Mississippi) and 2.33 (Florida).

Over this time frame, the average paper and allied products multiplier increased from 1.932 to 2.005.

All five Type III multipliers for each of the three forest-based industry sectors in Tennessee increased between 1992 and 2001. All five multipliers for the lumber and wood products sector increased in Florida, North Carolina, South Carolina, Tennessee, and Virginia, but all five decreased in Louisiana and Mississippi. The wood furniture sector experienced increases in all five multipliers in Oklahoma and Tennessee, but experienced decreases in Florida, Georgia, Kentucky, and Virginia. Paper and allied products multipliers increased in all five categories in Kentucky, North Carolina, Oklahoma, Tennessee, and Virginia. Overall, there was very little change in multipliers from 1992 to 2001. The largest increase in any of the type III multipliers was 0.5383 for Oklahoma's paper and allied products sector value-added multiplier and the largest decrease was 0.2987 for Alabama's furniture sector total income multiplier.

Table 17. Forest-based industry total income multipliers (aggregated) for the
southern United States by state and sector

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Alabama	Lumber and wood products	1.7380	2.6849	1.7329	2.5416
	Furniture	1.5170	2.4397	1.4064	2.1410
	Paper and allied products	1.5000	1.9048	1.5299	1.9907
Arkansas	Lumber and wood products	1.7270	2.6771	1.7624	2.5794
	Furniture	1.4273	2.2630	1.4366	2.1369
	Paper and allied products	1.4140	1.8659	1.4989	1.9719
Florida	Lumber and wood products	1.5184	2.7164	1.5543	2.7289
	Furniture	1.4322	2.6827	1.4051	2.5229
	Paper and allied products	1.4181	1.9601	1.6062	2.4350
Georgia	Lumber and wood products	1.7888	2.7321	1.7493	2.6584
	Furniture	1.6070	2.6595	1.5666	2.4770
	Paper and allied products	1.5203	1.9740	1.6449	2.2452
Kentucky	Lumber and wood products	1.6609	2.8449	1.7402	2.7155
	Furniture	1.3623	2.2415	1.3586	2.0053
	Paper and allied products	1.3503	1.8307	1.4693	1.9688
Louisiana	Lumber and wood products	1.7492	2.6238	1.6668	2.4494
	Furniture	1.5027	2.4395	1.4428	2.4080
	Paper and allied products	1.5055	1.9761	1.5678	2.0934
Mississippi	Lumber and wood products	1.8265	2.7297	1.7209	2.4677
	Furniture	1.4789	2.3048	1.4282	2.0757
	Paper and allied products	1.4166	1.8205	1.4829	1.9104
North Carolina	Lumber and wood products	1.7098	2.6165	1.7467	2.6551
	Furniture	1.5123	2.3391	1.5155	2.3575
	Paper and allied products	1.4905	1.9397	1.6327	2.2453
Oklahoma	Lumber and wood products	1.6371	2.7455	1.6431	2.5543
	Furniture	1.3096	2.1513	1.4310	2.3357
	Paper and allied products	1.3170	1.6660	1.6120	2.2803
South Carolina	Lumber and wood products	1.6806	2.4109	1.6860	2.4342
	Furniture	1.4917	2.3021	1.4212	2.1096
	Paper and allied products	1.4349	1.8024	1.4390	1.8595

Table 17. (Continued)

		1992		2001	
State	Sector	Type I	Type III	Type I	Type III
Tennessee	Lumber and wood products	1.5598	2.6388	1.7142	2.7707
	Furniture	1.4463	2.3283	1.5267	2.4543
	Paper and allied products	1.4240	1.8884	1.5886	2.2149
Texas	Lumber and wood products	1.6579	2.6315	1.6267	2.4935
	Furniture	1.5153	2.4381	1.4737	2.3277
	Paper and allied products	1.5082	2.0064	1.6365	2.2642
Virginia	Lumber and wood products	1.6298	2.4348	1.6767	2.5963
	Furniture	1.6095	2.5937	1.4792	2.3473
	Paper and allied products	1.4609	1.9038	1.5928	2.1647

Source: Aruna et al. (1997) and 2001 IMPLAN Database.

Table 18. Forest-based industry personal income multipliers (aggregated) for the southern United States by state and sector

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Alabama	Lumber and wood products	1.7468	2.6636	1.7618	2.5954
	Furniture	1.4566	2.2184	1.3832	2.0535
	Paper and allied products	1.4784	1.8746	1.4850	1.8932
Arkansas	Lumber and wood products	1.7029	2.5453	1.7574	2.5487
	Furniture	1.3795	2.0518	1.3962	2.0045
	Paper and allied products	1.4119	1.8608	1.4422	1.8486
Florida	Lumber and wood products	1.5379	2.6930	1.5458	2.6751
	Furniture	1.4219	2.5812	1.3824	2.4100
	Paper and allied products	1.5373	2.2174	1.5647	2.3257
Georgia	Lumber and wood products	1.8211	2.7427	1.7314	2.5883
	Furniture	1.5518	2.4352	1.5328	2.3556
	Paper and allied products	1.6275	2.1438	1.5860	2.1191
Kentucky	Lumber and wood products	1.7360	3.0122	1.7373	2.6823
	Furniture	1.3154	2.0427	1.3779	2.0342
	Paper and allied products	1.3546	1.8237	1.4321	1.8764
Louisiana	Lumber and wood products	1.7373	2.5456	1.6740	2.4460
	Furniture	1.4726	2.2930	1.4255	2.3232
	Paper and allied products	1.4621	1.8976	1.5093	1.9647
Mississippi	Lumber and wood products	1.8279	2.7073	1.7242	2.4616
	Furniture	1.4030	2.0460	1.3915	1.9599
	Paper and allied products	1.3472	1.6919	1.4312	1.8022
North Carolina	Lumber and wood products	1.7315	2.6046	1.7379	2.6121
	Furniture	1.4407	2.0927	1.4844	2.2456
	Paper and allied products	1.4902	1.9243	1.5926	2.1507
Oklahoma	Lumber and wood products	1.6176	2.6073	1.6300	2.5162
	Furniture	1.2445	1.8753	1.3845	2.1642
	Paper and allied products	1.5072	2.0449	1.4985	2.0656
South Carolina	Lumber and wood products	1.6854	2.3922	1.6793	2.3967
	Furniture	1.4170	2.0531	1.3927	2.0070
	Paper and allied products	1.3983	1.7296	1.4022	1.7764

Table 18. (Continued)

State	Sector	1992		2001	
		Type I	Type III	Type I	Type III
Tennessee	Lumber and wood products	1.5994	2.6665	1.7409	2.7762
	Furniture	1.4049	2.1280	1.4870	2.2785
	Paper and allied products	1.4558	1.9327	1.5238	2.0390
Texas	Lumber and wood products	1.6407	2.5173	1.6134	2.4406
	Furniture	1.5017	2.3037	1.4212	2.1492
	Paper and allied products	1.5539	2.0918	1.5421	2.0772
Virginia	Lumber and wood products	1.6606	2.4650	1.6747	2.5852
	Furniture	1.5292	2.3343	1.4450	2.2332
	Paper and allied products	1.4545	1.8821	1.5720	2.1249

Source: Aruna et al. (1997) and 2001 IMPLAN Database.

CHAPTER V

DISCUSSION

In general, the forest-based industry's economic contribution to the southern economy has changed little from the early 1990's to 2001. In the South, the forest-based industry experienced real increases in earnings, value of shipments, and manufacturing value-added. For example, Georgia, Kentucky, and Texas saw increases in all three categories. The economic multipliers for the industry shifted somewhat, but the changes were typically small. For example, the largest increase for any of the forest-based industry multipliers was 0.5383 and the largest decrease was 0.2987. Forest-based industry in the South has maintained its level of economic contribution in comparison to the rest of the economy over the study period.

This study did not assign any value to the non-market benefits derived from the timberlands which support forest-based industry. Although these benefits may not be directly captured by the landowner or the state economies they provide social and environmental benefits. Non-market benefits, recreation, and wildlife hunting work to increase the importance of forest-based industry in the South. Many states are not capturing some of these additional benefits because landowners lack adequate information about them.

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With the U.S. Forest Service projecting increasing demand for forest-based products, the South's forest-based industries have the potential to maintain, if not increase their economic contribution into the foreseeable future. However, increasing pressure from urbanization, special interest groups, the potential for policy changes, and other factors could make it increasingly difficult to economically justify timber production. If not addressed, these factors may limit forest-based industry activities and their contribution to state economies. Practicing sustainable forestry, which increases utilization of timberlands and encourages environmentally sound practices, could help reduce the pressures from special interest groups and potential policy changes which could negatively impact forest-based industries.

Southern states should also try to attract additional forest-based industry to increase the utilization of timberlands and their products in the South. They should take steps to protect timberlands against loss to the increased threat of eminent domain and other threats to allow forest-based industry to maintain or increase its economic contribution. If policy makers realize the importance of forest-based industry and their potential for improvement, the political environment in the South could be favorable to forest-based industry.

Future Research

This study accounts for the market-derived benefits from the forest-based industry. To determine the total contribution of timberlands to an economy, non-market, wildlife, and recreation benefits should be included. Although monetary

benefits may not be entirely captured by landowners, the benefits and/or reduced cost to the economy should be attributed to the forest-based industry sector. Realizing these additional contributions could be important in guiding policy formation. If these benefits are accounted for, the economic contributions of forest-based industry could potentially be much larger.

CHAPTER VI

CONCLUSIONS

Southern forest-based industry employment decreased as a percentage of both total southern employment and total U.S. forest-based employment, likely due to technological advances. Forest-based earnings in the South as a percentage of total southern earnings remained constant over the study period, but increased as a percentage of total U.S. forest-based earnings. Although southern forest-based employment accounted for less of the total U.S. forest-based employment, southern forest-based earnings increased at a higher rate than the rest of the U.S. forest-based industry. Forest-based employment and earnings accounted for 1.1% and 1.3%, respectively, of the South's totals and a slightly greater amount of the South's GSP (1.4%) in 2001.

Value of shipments and manufacturing value-added from southern forest-based industry both experienced real increases from 1991 to 2001. Despite these increases, only Kentucky had an increase in the forest-based manufacturing value-added as a percentage of GSP. This indicates that Kentucky's forest-based industry economic contributions increased faster than other industries. The total taxes generated by the southern forest-based industry in 2001 exceeded $21.3 billion.

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The forest-based industry was most important in Arkansas, Mississippi, and Alabama when compared to the other industries within the state, however, North Carolina, Georgia, and Texas had the largest forest-based industries in absolute terms. These larger state economies are less dependent on forest-based industry in relative terms, but the industry still accounts for over 70,000 jobs in each state. Accounting for the additional benefits from timberlands makes the forest-based industry of increased importance.

Overall there has been little change in the forest-based industry's multipliers in the South. This indicates that southern state economies are capturing about the same portion of its economic activity from forest-based industry over the time period examined. Since forest-based industry obtains many of its input from the local area, the multipliers are not likely to change much. Thus, increasing the economic contribution from forest-based industry would require expanding the industry. Technological advances could allow existing forest-based industries to increase their economic contributions. Also, intensively managing more of the South's timberland could support larger forest-based industries.

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APPENDIX A

IMPLAN OUTPUTS

Table A.1   2001 IMPLAN database deflators 2001 dollars to 1998 dollars

	1998			
	All	Forestry	Paper and Allied Products	Lumber and Wood Products
Alabama	0.920	0.965	0.903	0.843
Arkansas	0.916	0.965	0.905	0.843
Florida	0.915	0.965	0.906	0.853
Georgia	0.919	0.965	0.905	0.846
Kentucky	0.921	0.965	0.908	0.854
Louisiana	0.906	0.965	0.905	0.848
Mississippi	0.912	0.965	0.905	0.845
North Carolina	0.922	0.965	0.909	0.853
Oklahoma	0.919	0.965	0.905	0.843
South Carolina	0.916	0.965	0.907	0.845
Tennessee	0.916	0.965	0.905	0.850
Texas	0.921	0.965	0.908	0.857
Virginia	0.916	0.965	0.907	0.855
South	0.918	0.965	0.906	0.849
United States	0.919	0.965	0.907	0.851

Source: 2001 IMPLAN Database

Table A.2   2001 IMPLAN database deflators 2001 dollars to 1990 dollars

	1990			
	All	Forestry	Paper and Allied Products	Lumber and Wood Products
Alabama	0.790	0.905	0.837	0.620
Arkansas	0.782	0.905	0.826	0.620
Florida	0.749	0.905	0.819	0.634
Georgia	0.768	0.883	0.801	0.634
Kentucky	0.804	0.883	0.798	0.643
Louisiana	0.808	0.905	0.830	0.628
Mississippi	0.783	0.905	0.827	0.622
North Carolina	0.798	0.905	0.815	0.632
Oklahoma	0.815	0.905	0.822	0.618
South Carolina	0.767	0.905	0.819	0.623
Tennessee	0.774	0.905	0.823	0.627
Texas	0.816	0.905	0.811	0.635
Virginia	0.759	0.905	0.821	0.632
South	0.787	0.905	0.822	0.627
United States	0.784	0.905	0.818	0.628

Source: 2001 IMPLAN Database

Table A.3   2001 IMPLAN database deflators 2001 dollars to 1991 dollars

	All	Lumber and Wood Products	Paper and Allied Products	Wood Furniture
Alabama	0.805	0.629	0.802	0.752
Arkansas	0.796	0.629	0.801	0.790
Florida	0.773	0.645	0.798	0.746
Georgia	0.789	0.634	0.801	0.750
Kentucky	0.820	0.634	0.798	0.771
Louisiana	0.806	0.634	0.799	0.723
Mississippi	0.796	0.631	0.799	0.802
North Carolina	0.816	0.644	0.792	0.799
Oklahoma	0.816	0.627	0.803	0.758
South Carolina	0.788	0.632	0.796	0.763
Tennessee	0.793	0.638	0.800	0.788
Texas	0.822	0.647	0.797	0.745
Virginia	0.782	0.644	0.795	0.769
South	**0.801**	**0.638**	**0.798**	**0.778**

Source: 2001 IMPLAN Database

Table A.4   SAM multipliers (aggregated) for forest-based industry in the Southern
United States by state and sector

State	Sector	TYPE SAM				
		Output	Employment	Value-added	Total Income	Personal Income
Alabama	Lumber and wood products	1.8437	2.2138	2.1873	2.1106	2.1513
	Furniture	1.7495	1.6778	1.8688	1.7109	1.6611
	Paper and allied products	1.5160	2.8676	1.7655	1.8607	1.7781
Arkansas	Lumber and wood products	1.8548	2.2204	2.2401	2.1427	2.1256
	Furniture	1.7459	1.7380	1.8725	1.7444	1.6635
	Paper and allied products	1.5311	2.4840	1.7938	1.8200	1.7180
Florida	Lumber and wood products	1.7685	1.9852	2.1581	2.0170	1.9908
	Furniture	1.7744	1.6999	2.0004	1.8221	1.7658
	Paper and allied products	1.6323	2.6469	2.1809	2.0834	2.0029
Georgia	Lumber and wood products	1.9131	2.1630	2.3463	2.2080	2.1639
	Furniture	1.8916	1.7699	2.1857	1.9763	1.9032
	Paper and allied products	1.6501	2.6149	2.0877	2.0749	1.9680
Kentucky	Lumber and wood products	1.8214	1.9924	2.3314	2.1153	2.1007
	Furniture	1.7095	1.6962	1.7686	1.6522	1.6758
	Paper and allied products	1.5288	2.2301	1.8425	1.7844	1.7124
Louisiana	Lumber and wood products	1.8109	2.2000	2.1191	2.0481	2.0501
	Furniture	1.7192	1.5513	1.9450	1.7714	1.7311
	Paper and allied products	1.5479	2.7529	1.8582	1.9231	1.8172
Mississippi	Lumber and wood products	1.8044	2.1752	2.1125	2.0748	2.0735
	Furniture	1.7832	1.7399	2.0653	1.7197	1.6473
	Paper and allied products	1.5031	2.5496	1.7738	1.7856	1.6938
North Carolina	Lumber and wood products	1.8595	2.1574	2.2986	2.1671	2.1424
	Furniture	1.8580	1.7624	2.1627	1.8789	1.8130
	Paper and allied products	1.5842	2.5154	2.0699	2.0246	1.9496
Oklahoma	Lumber and wood products	1.8084	2.1849	2.2416	2.0584	2.0341
	Furniture	1.7553	1.7145	1.9644	1.7902	1.6941
	Paper and allied products	1.5983	2.5540	2.0130	2.0173	1.8425
South Carolina	Lumber and wood products	1.7769	2.1131	2.0995	2.0471	2.0256
	Furniture	1.7387	1.6759	1.9125	1.7243	1.6632
	Paper and allied products	1.4983	2.4188	1.7698	1.7460	1.6754
Tennessee	Lumber and wood products	1.8980	2.0765	2.4740	2.1962	2.2133
	Furniture	1.8720	1.8318	2.1693	1.9529	1.8507
	Paper and allied products	1.6047	2.6572	2.0137	2.0312	1.8880
Texas	Lumber and wood products	1.8290	1.9743	2.2284	2.0471	2.0148
	Furniture	1.8212	1.6809	2.0451	1.8515	1.7434
	Paper and allied products	1.6885	2.3580	2.1580	2.0570	1.9007
Virginia	Lumber and wood products	1.7601	1.9960	2.2079	2.0746	2.0688
	Furniture	1.7495	1.6790	1.9907	1.8279	1.7645
	Paper and allied products	1.5515	2.4903	1.9535	1.9704	1.9372

Source: 2001 IMPLAN Database

Table A.5 Southern forest-based economic contribution measures from the 2001
IMPLAN database

State	Employment (full- and part-time jobs)	Total Income (millions of $)	Personal Income (millions of $)	Total Output (millions of $)	Value-Added (millions of $)
Alabama	**2,421,223**	**78,499.5**	**70,610.8**	**225,575.4**	**119,442.1**
Lumber and wood products	25,467	854.9	725.9	3,883.2	1,305.1
Paper and allied products	16,356	1,116.2	1,102.9	6,098.4	2,109.8
Wood furniture	14,530	417.5	400.4	1,300.3	562.1
Total	**56,353**	**2,388.6**	**2,229.2**	**11,281.9**	**3,977.0**
Arkansas	**1,517,570**	**43,792.9**	**38,738.3**	**136,607.1**	**66,854.6**
Lumber and wood products	20,362	611.4	543.1	2,882.1	899.3
Paper and allied products	13,479	1,522.7	712.7	3,660.1	1,212.9
Wood furniture	9,926	275.3	272.6	927.7	381.9
Total	**43,767**	**2,409.4**	**1,528.4**	**7,469.9**	**2,494.1**
Florida	**9,172,732**	**315,613.9**	**286,082.7**	**810,441.3**	**491,198.8**
Lumber and wood products	17,077	548.5	511.2	2,134.5	775.4
Paper and allied products	11,614	634.5	619.1	3,091.9	945.3
Wood furniture	19,008	556.5	542.4	1,685.7	744.9
Total	**47,699**	**1,739.5**	**1,672.7**	**6,912.1**	**2,465.6**
Georgia	**4,964,658**	**194,681.8**	**173,539.9**	**525,771.1**	**307,932.2**
Lumber and wood products	26,761	933.3	874.1	3,865.9	1,370.8
Paper and allied products	27,910	1,624.6	1,615.0	7,960.2	2,676.9
Wood furniture	16,144	478.1	460.8	1,557.1	639.9
Total	**70,815**	**3,036.0**	**2,949.9**	**13,383.2**	**4,687.6**
Kentucky	**2,327,652**	**74,231.6**	**67,272.3**	**227,294.8**	**113,884.7**
Lumber and wood products	16,047	407.0	368.7	1,892.2	531.0
Paper and allied products	10,616	526.7	519.7	2,515.1	804.0
Wood furniture	8,415	265.3	229.5	790.0	362.6
Total	**35,078**	**1,199.0**	**1,117.9**	**5,197.3**	**1,697.6**
Louisiana	**2,502,534**	**80,588.3**	**71,577.7**	**245,162.2**	**122,582.8**
Lumber and wood products	13,544	473.6	410.6	2,066.7	719.2
Paper and allied products	10,542	629.0	620.9	3,413.8	1,117.1
Wood furniture	1,732	37.3	34.3	127.1	49.7
Total	**25,818**	**1,139.9**	**1,065.8**	**5,607.6**	**1,886.0**

Table A.5   (Continued)

State	Employment (full- and part-time jobs)	Total Income (millions of $)	Personal Income (millions of $)	Total Output (millions of $)	Value-Added (millions of $)
Mississippi	**1,481,891**	**42,089.9**	**37,273.3**	**124,669.6**	**63,204.2**
Lumber and wood products	21,748	684.7	590.8	3,285.6	1,073.1
Paper and allied products	7,762	453.6	445.3	2,401.9	764.6
Wood furniture	27,121	796.0	772.6	2,487.1	875.5
Total	**56,631**	**1,934.3**	**1,808.7**	**8,174.6**	**2,713.2**
North Carolina	**4,924,710**	**170,379.6**	**154,338.7**	**480,296.9**	**260,284.5**
Lumber and wood products	29,921	944.2	874.4	4,236.2	1,365.1
Paper and allied products	21,148	1,066.4	1,043.2	5,781.8	1,684.1
Wood furniture	71,997	2,034.7	2,006.0	6,571.7	2,494.5
Total	**123,066**	**4,045.3**	**3,923.6**	**16,589.7**	**5,543.7**
Oklahoma	**2,064,469**	**63,086.8**	**53,276.4**	**190,277.3**	**97,844.0**
Lumber and wood products	4,265	134.4	117.1	589.2	185.0
Paper and allied products	2,930	136.1	136.0	746.0	229.6
Wood furniture	3,753	96.5	94.8	324.8	129.9
Total	**10,948**	**367.0**	**347.9**	**1,660.0**	**544.5**
South Carolina	**2,280,026**	**73,015.3**	**66,510.9**	**206,423.4**	**111,346.6**
Lumber and wood products	13,121	462.1	393.2	1,997.7	671.4
Paper and allied products	14,736	879.1	874.2	4,245.0	1,441.8
Wood furniture	6,129	174.8	173.4	562.9	229.9
Total	**33,986**	**1,516.0**	**1,440.8**	**6,805.6**	**2,343.1**
Tennessee	**3,472,042**	**117,512.4**	**101,712.0**	**341,800.9**	**183,692.3**
Lumber and wood products	17,172	497.2	416.0	2,108.8	640.2
Paper and allied products	20,573	1,146.4	1,142.5	5,930.2	1,930.0
Wood furniture	23,762	690.3	663.2	2,325.6	910.5
Total	**61,507**	**2,333.9**	**2,221.7**	**10,364.6**	**3,480.7**
Texas	**12,638,113**	**504,759.2**	**425,226.2**	**1,421,497.7**	**790,807.3**
Lumber and wood products	28,435	955.5	838.5	3,179.4	1,327.7
Paper and allied products	26,004	1,327.9	1,304.4	6,239.1	2,044.4
Wood furniture	32,058	949.6	932.8	2,955.7	1,277.3
Total	**86,497**	**3,233.0**	**3,075.7**	**12,374.2**	**4,649.4**

Table A.5   (Continued)

State	Employment (full- and part-time jobs)	Total Income (millions of $)	Personal Income (millions of $)	Total Output (millions of $)	Value-Added (millions of $)
Virginia	**4,523,325**	**183,930.6**	**170,953.0**	**441,841.0**	**269,407.9**
Lumber and wood products	20,696	646.0	594.7	2,980.0	928.5
Paper and allied products	13,367	753.2	710.2	3,980.7	1,261.1
Wood furniture	25,914	731.5	734.4	2,478.8	991.4
Total	**59,977**	**2,130.7**	**2,039.3**	**9,439.5**	**3,181.0**
South	**54,290,945**	**1,942,181.8**	**1,717,112.2**	**5,377,658.7**	**2,998,482.0**
Lumber and wood products	254,616	8,152.8	7,258.3	35,101.5	11,791.8
Paper and allied products	197,037	11,816.4	10,846.1	56,064.2	18,221.6
Wood furniture	260,489	7,503.4	7,317.2	24,094.5	9,650.1
Total	**712,142**	**27,472.6**	**25,421.6**	**115,260.2**	**39,663.5**