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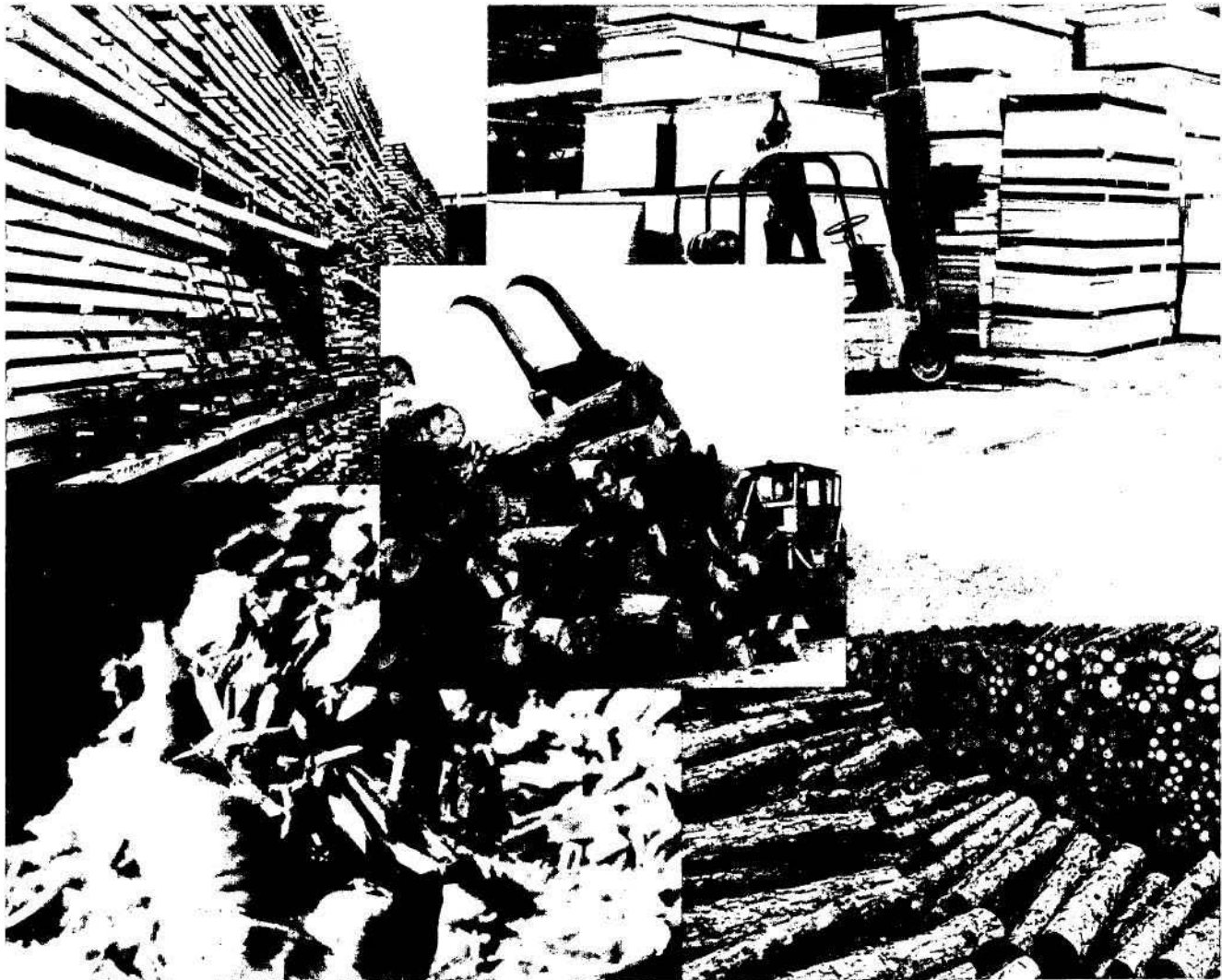


EDITOR'S

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SOUTH CAROLINA'S Forest Products Industry: Performance and Contribution to the State's Economy, 1970 to 1980

Wilbur R. Maki, Con H Schallau, Bennett B. Foster, and Clair H. Redmond



Abbreviations

States

AL Alabama
AR Arkansas
FL Florida
GA Georgia
KY Kentucky
LA North Carolina
MS Mississippi
NC North Carolina
OK Oklahoma
SC South Carolina
TN Tennessee
TX Texas
VA Virginia
SO South
US United States

Industries

FPI Forest Products Industry
LWP Lumber and Wood
Products
PAP Paper and Allied
Products
WF Wood Furniture

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Abstract

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Employment and earnings in South Carolina's forest products industry, like those of most Southern States, grew significantly between 1970 and 1980. The forest products industry accounted for a larger share of the State's economic base in 1980 than in 1970. Moreover, during this period, the State increased its share of the Nation's forest products industry employment and earnings. Pulp and allied products had the highest productivity, but lumber and wood products experienced the largest increase in productivity between 1972 and 1977.

Keywords: Forest products industries, economics (forest products industries), South Carolina.

Preface

South Carolina's forest products industry, like that of most Southern States, experienced significant growth during the 1970's. This resurgence resulted from the increasing size and amount of timber, investment in new plants and equipment, and a growing demand for South Carolina's forest products.

This report briefly describes South Carolina's forest products industry--its composition, location, evolution, and relation to economic activity elsewhere in the State, the South, and the Nation.

Estimates of employment and earnings shown in this report were derived from U.S. Department of Commerce data. All references to dollar amounts are in constant 1977 dollars.

This is one in a series of reports for each of the 13 Southern States. These reports are companions to an analysis of the changing roles of the forest products industries of the South and the Pacific Northwest.

Highlights

- In 1980, the forest products industry was the fifth largest component of South Carolina's economic base (the economic base is comprised of industries producing for export outside the State). Furthermore, the forest products industry was a larger component of the State's economic base in 1980 than it was in 1970.
- In terms of earnings, paper and allied products is the largest component of the State's forest products industry. During the 1970's, it was the fastest growing segment of South Carolina's forest products industry in terms of both employment and earnings.
- In 1977, pulp and allied products accounted for the largest share of value added by South Carolina's forest products industry. Lumber and wood products showed however, a significantly greater increase in the rate of growth between 1972 and 1977.

- In terms of capital productivity (measured in terms of value added minus payroll, per worker hour), South Carolina's forest products industry was the fifth most efficient in the South.
- In 1977, paper and allied products had the highest productivity in the State's forest products industry. Lumber and wood products, however, exhibited the greatest increase in productivity between 1972 and 1977.
- During the 1970's, South Carolina increased its share of the Nation's employment and earnings in the forest products industry.
- In 1980, average earnings in South Carolina were below the average for the Nation's forest products industry. Between 1970 and 1980, the rate of growth in earnings in South Carolina exceeded the rate for the Nation.
- Earnings for South Carolina's paper and allied products workers were significantly greater than the earnings in the other components of the forest products industry.
- In 1980, South Carolina ranked eighth among the South's 13 States in terms of timber dependency.

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**The Forest Products
Economy of South
Carolina
The State's Workforce**

South Carolina's estimated full- and part-time workforce in 1980 was comprised of an estimated 1.5 million employees and proprietors (see appendix tables for sources of employment and earnings data). Like many Sunbelt States, South Carolina's workforce grew faster between 1970 and 1980 than did the national average (28.1 percent versus 22.3 percent). Total earnings-wage and salary payments and proprietorial income-also grew faster than the national average. Measured in constant 1977 dollars, the State's earnings increased by 35.1 percent as compared to 27.4 percent for the Nation. As can be seen in the following tabulation, manufacturing, services, and State and local government were the State's three largest employer categories:

<u>Employers</u>	<u>Percent of total employment, 1980</u>	
	<u>South Carolina</u>	<u>U.S.</u>
Major industries:		
Manufacturing (including the forest products industry)	26.54	19.15
Services	13.65	18.22
State and local government	13.15	12.56
Retail trade	11.87	14.18
Nonfarm proprietors	5.86	6.58
Agriculture	5.26	4.39
Construction	4.98	4.08
Transportation, communication, and public utilities	3.59	4.84
Wholesale trade	<u>3.38</u>	<u>4.97</u>
Subtotal	88.28	88.97
All other industries	<u>11.72</u>	<u>11.03</u>
Total	100.00	100.00

Components of the State's Economic Base

Along with total employment there is another and perhaps more important way to judge an industry's contribution to South Carolina's economy. For the State's economy to grow and develop, it must attract new dollars so residents can buy goods and services produced elsewhere. The industries that export products and services beyond local boundaries (that is, to elsewhere in the State, to other States, and to the world) and bring in new dollars, constitute the State's economic base. Generally speaking, most manufacturing employment is classified as "economic base" (or "basic"), while residentiary employment (for example, barber shops, realty firms, schools, and local government) is primarily geared to producing for local needs. Federal military provides national defense for all of the Nation's citizens. Furthermore, taxpayers outside South Carolina help support this activity; consequently, Federal military qualifies as a basic industry.

Residentiary employment is supported by the economic base. Money flowing in provides income for wage earners and entrepreneurs to spend on locally purchased goods and services. In most cases, the economic growth of a region is dependent upon the success of its economic base.

We used the excess employment technique to identify the industries that comprise South Carolina's (or a substate district's) economic base. This approach accepts the national distribution of employment among industries as a norm. Any industry with employment in excess of this norm is considered to be producing for export markets outside the State (or substate district) and is part of South Carolina's economic base. The percentage of South Carolina's excess employment served as an indicator of the State's dependency on a particular industry for generating new dollars from outside the State. The percentage associated with the forest products industry is defined as the timber-dependency indicator (table 2 shows how excess employment and industry dependency indicators for South Carolina were calculated). A particular industry may be basic at the local level but not at the State level.

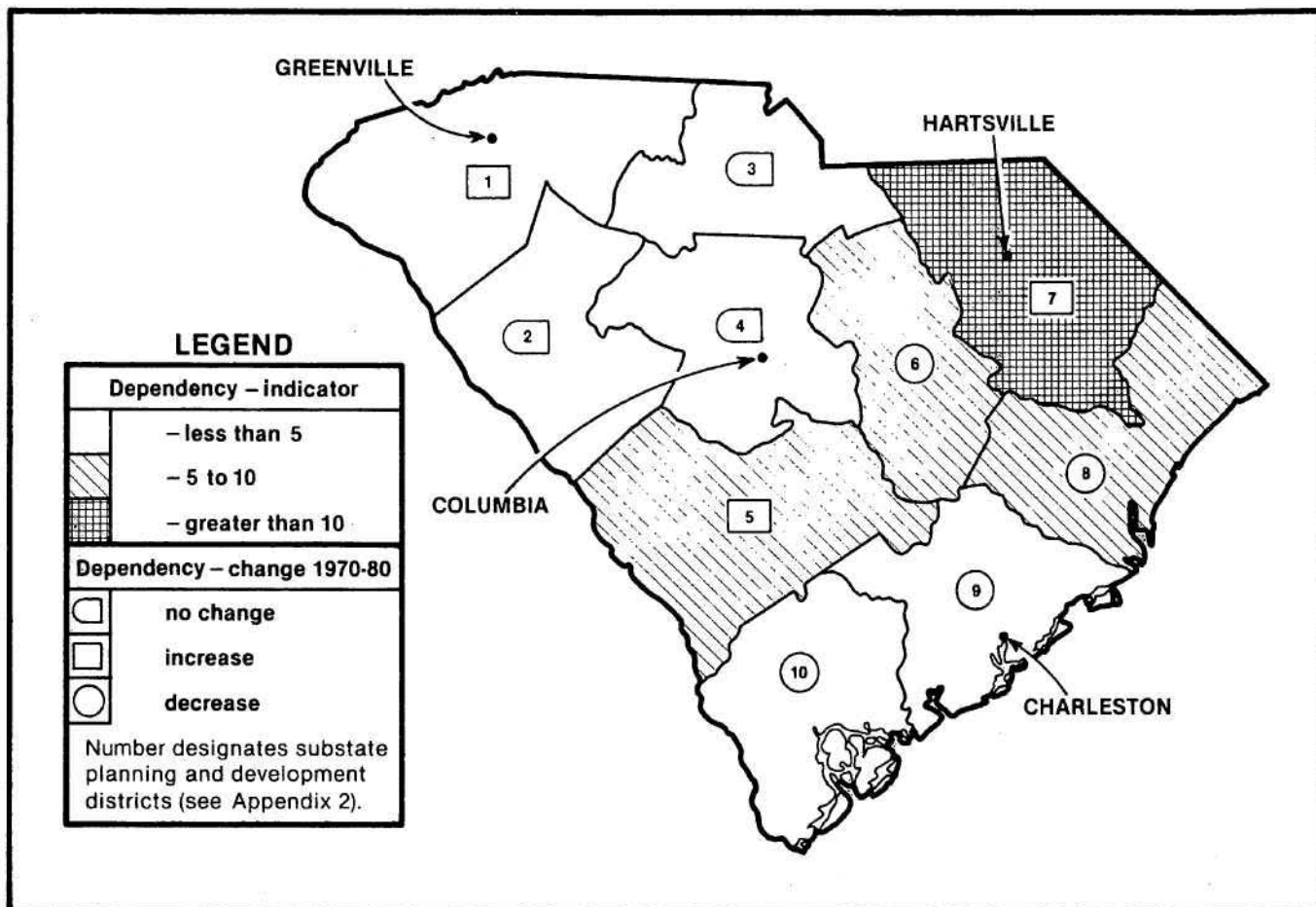
In 1980, nine industries accounted for nearly all of the State's excess employment--that is, its economic base (see tabulation below). Although these same industries accounted for a slightly larger share (97.31 percent) in 1970, the change in shares of certain individual industries was quite significant. Textiles and apparel dominated South Carolina's economic base, but less so in 1980 than in 1970. Agriculture was also less important in 1980 than 1970. Federal military personnel accounted for nearly the same proportion of the economic base in 1970 as in 1980. As seen in the following tabulation of selected industry dependency indicators, the forest products industry was more important in 1980 than in 1970:

<u>Economic base industries</u>	<u>Dependency indicator</u>	
	<u>1970</u>	<u>1980</u>
	(Percent of economic base)	
Textiles and apparel	60.65	55.47
Federal military	18.08	18.88
Chemical and allied products	4.55	6.40
Agriculture	9.49	5.53
Forest products ^{1/}	3.45	3.85
Rubber and miscellaneous		
Plastics	0	2.81
Electrical, gas, and sanitation		
Services	0	.95
Stone, clay, and glass products	1.03	.69
Nonmetallic minerals	<u>.06</u>	<u>.07</u>
Subtotal	97.31	94.65
All other industries	<u>2.69</u>	<u>5.35</u>
Total	100.00	100.00

^{1/} For the purposes of this analysis, the forest products industry is comprised of (1) lumber and wood products (SIC 24), except mobile homes (SIC 2451); and (2) wood furniture (SIC 2511, 2512, 2517, 2521, 2541), and paper and allied products (SIC 26).

Geographical Importance of the State's Forest Products Industry

The contribution of the forest products industry to South Carolina's economic base varies between substate districts (see Appendix 2 for a listing of counties by district). Generally speaking, the forest products industry is more important in northeastern South Carolina than elsewhere. For example, the forest products industry accounts for 16 percent of the economic base (that is, those industries producing for export to other States and the rest of the world) in the Pee Dee area, but less than 1 percent in the southern coastal plain area. South Carolina's dependency on the forest products industry to produce exports increased or remained constant in most substate districts between 1970 and 1980. The exceptions were the coastal districts.

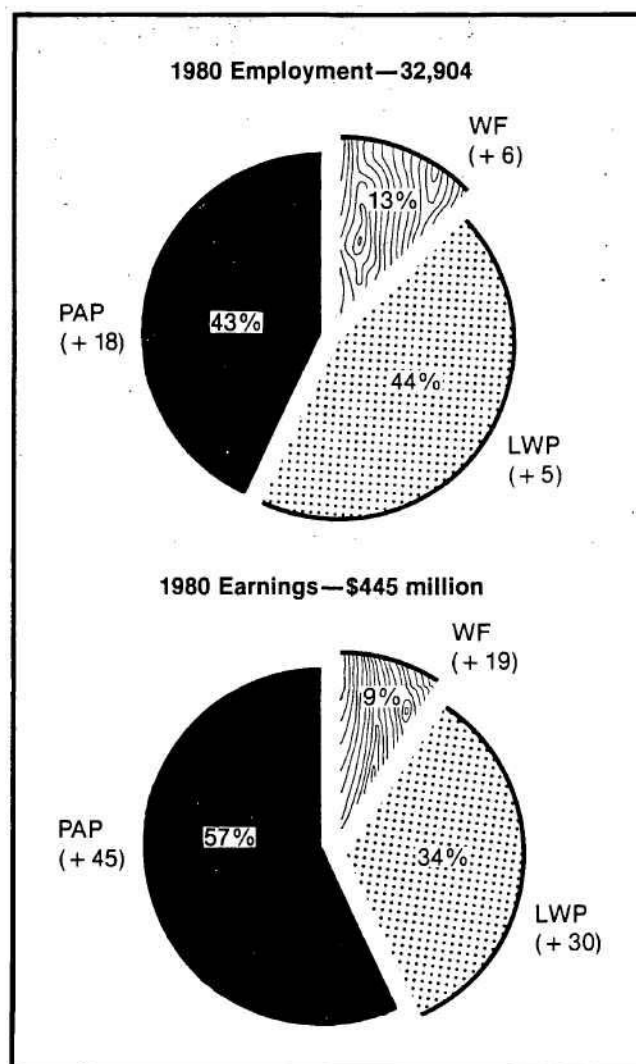


Source: Substate estimates for 1970 and 1980 were derived from unpublished county data series provided by the U.S. Department of Commerce, Regional Economic Information System, Washington, DC; and from the Department's *County Business Patterns*. The numbers used to designate substate districts correspond to the geographical classification of counties as shown in Appendix 2.

Composition of the State's Forest Products Industry

South Carolina's forest products industry is comprised of paper and allied products, lumber and wood products (not including mobile homes), and wood furniture. In 1980, paper and allied products and lumber and wood products accounted for nearly equal shares of approximately 33,000 workers employed by South Carolina's forest products industry. The paper and allied products industry had the largest share of 1980 earnings.

Lumber and wood products and wood furniture employment changed little during the 1970's. Growth in employment of the paper and allied products industry was substantially greater than for the other two components but was not as fast as for the average for all industries (22.3 percent). Growth of wood furniture earnings lagged behind the national average (27.4 percent), although earnings growth for the other components exceeded the national average.

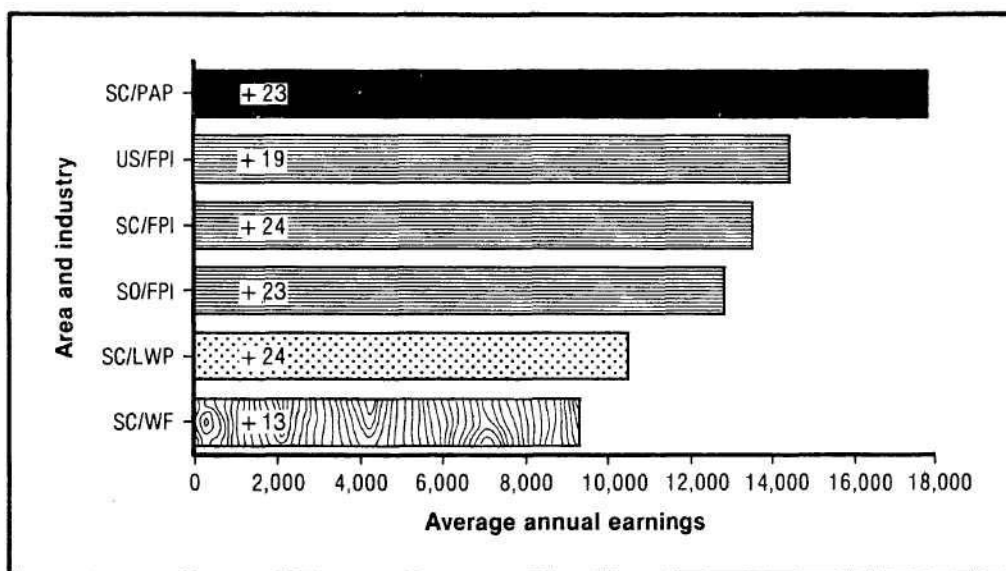


Numbers in parentheses show percentage of change from 1970 to 1980.

Average Annual Earnings per Worker

Average annual 1980 earnings per worker in paper and allied products were significantly greater than were earnings in the other two components. Higher average skill levels, capital investment per worker, and unions account for this difference. Earnings in wood furniture were half those for paper and allied products and significantly below the average for all forest products industries in the South and the United States.

Average annual earnings in South Carolina's forest products industry were intermediate between those for the Nation and for the South. Average growth in earnings was greater for South Carolina than for the South and the Nation. Growth of earnings for wood furniture lagged significantly behind the rest of the industry.

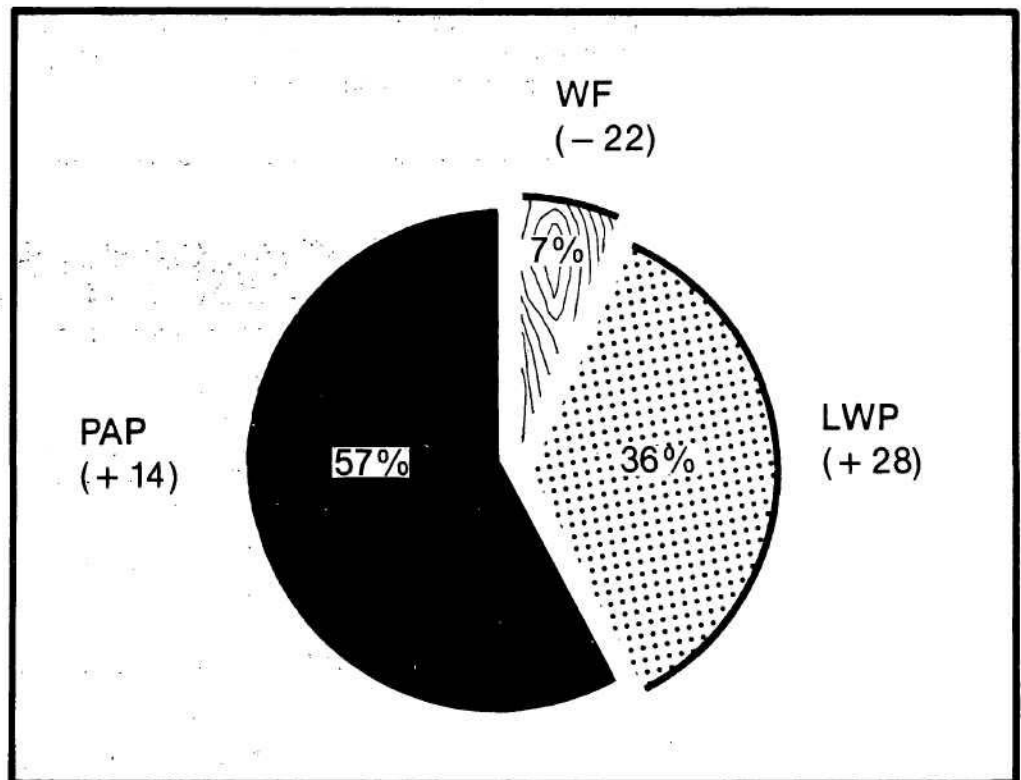


Numbers in bars show percentage of change from 1970 to 1980.

**Value Added by the
Forest Products
Industry**

Value added by manufacturing represents income payments made directly to workers and business owners. It is equal to the value of shipments less the cost of materials, parts, supplies, fuel, goods purchased for resale, electric energy, and contract work. Unlike value of shipments, value added avoids double counting. Consequently, value added by manufacturing is considered the best monetary gauge of the relative economic importance of a manufacturing industry.

In 1977, paper and allied products accounted for more than half of the \$800 million of the value added by South Carolina's forest products industry. Between 1972 and 1977, the value added by lumber and wood products grew at twice that - of paper and allied products. Value added by Wood furniture declined significantly during this period.

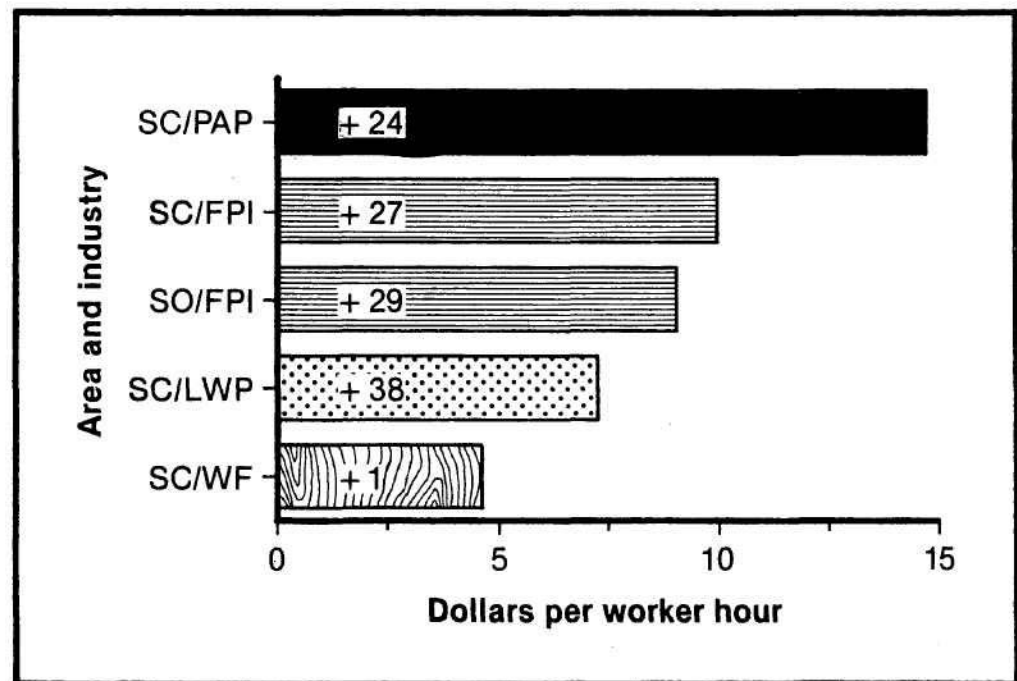


Numbers in parentheses show percentage of change from 1972 to 1977.

Capital Productivity

Increases in productivity are necessary for an industry to remain competitive in the marketplace. Capital productivity of an industry is measured in terms of value added, minus payroll, per worker hour-VAMP (see table 3 for an explanation of how capital productivity was calculated for South Carolina's forest products industry). This measure of productivity adjusts for wide differences in payroll among industries and represents the return to capital investment and entrepreneurship.

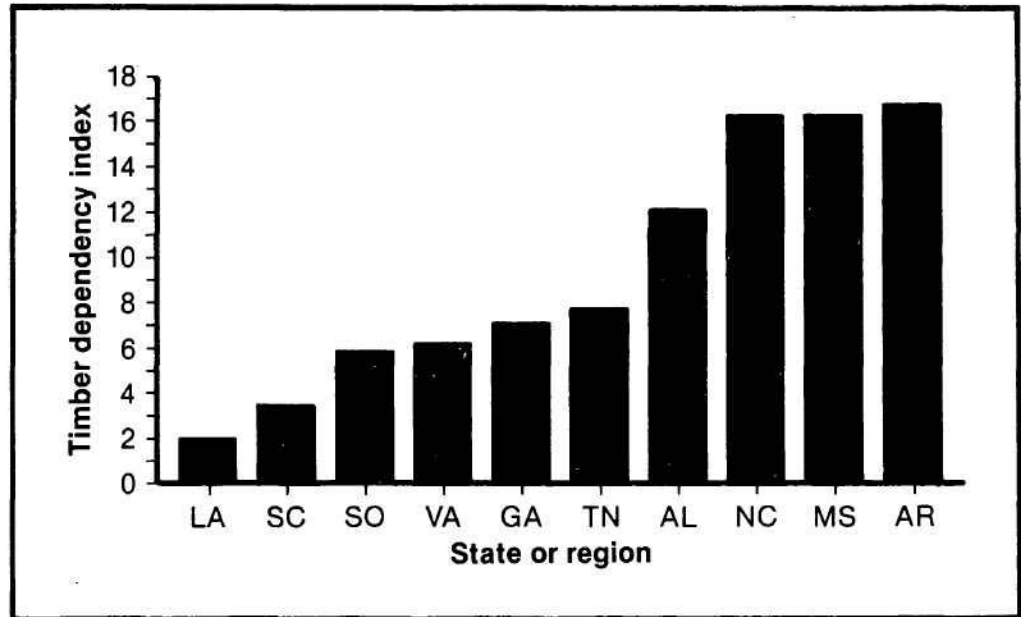
Not surprisingly, paper and allied products had the highest productivity in South Carolina's forest products industry. This component is more capital intensive and in the past has attracted considerable investment in new facilities and equipment. During the mid-1970's, however, lumber and wood products exhibited a larger gain in productivity than did paper and allied products. Continued improvements in logging techniques as well as in manufacturing processes accounted for the gain in lumber and wood products. The relatively low productivity of wood furniture as compared to the rest of the forest products industry reflects the labor-intensive nature of its manufacturing process.



Numbers in bars show percentage of change from 1972 to 1977.

The Forest Products Industry in the South
Importance of the Industry Across the South

The dependency indicators suggest that all but four States in the South manufactured forest products in excess of local needs: Florida, Kentucky, Oklahoma, and Texas were not self-sufficient with respect to forest products. Consequently, on net balance, their respective forest products industries did not generate new dollars from outside. In South Carolina, the forest products industry accounted for 3.8 percent of economic base employment, or approximately 1 out of 26 basic employees. In three States-North Carolina, Arkansas and Mississippi--the forest products industry accounted for approximately 16 percent of those States' economic base, or 1 out of 6 basic employees.



Industry Composition

Paper and allied products accounted for a larger share of South Carolina's 1980 forest products industry employment and earnings than it did for the South. Although this industry's employment increased in South Carolina and the South between 1970 and 1980, it decreased nationwide. Likewise, the growth of paper and allied products' earnings nationwide lagged behind those in South Carolina and the South.

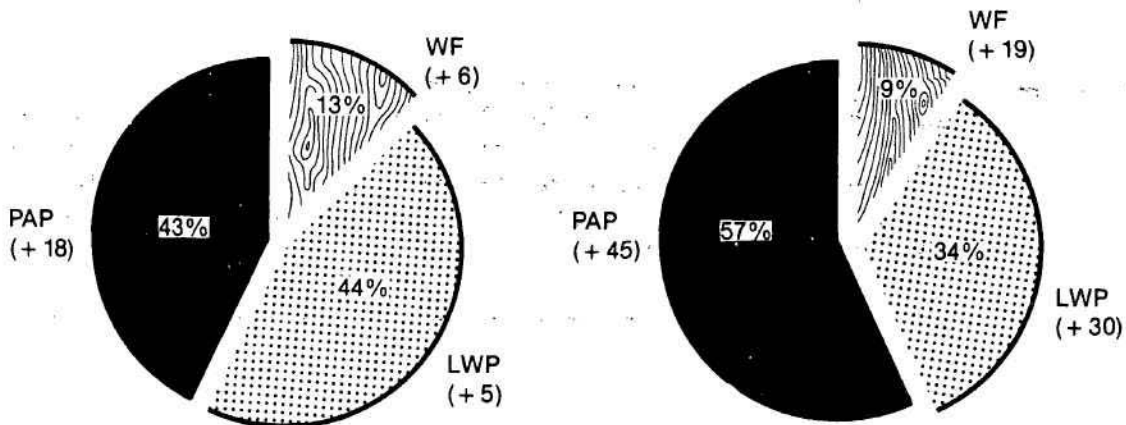
Wood furniture is a less important segment of the forest products industry in South Carolina than in the South or the Nation. Growth of this industry's employment was substantially greater for the South than for South Carolina or the Nation.

Lumber and wood products accounted for about the same proportion of South Carolina's forest products industry's employment and earnings as it did for the South and the Nation. During the 1970's employment and earnings growth in this industry in South Carolina was less than in the South or the Nation.

SOUTH CAROLINA

1980 Employment—32,904

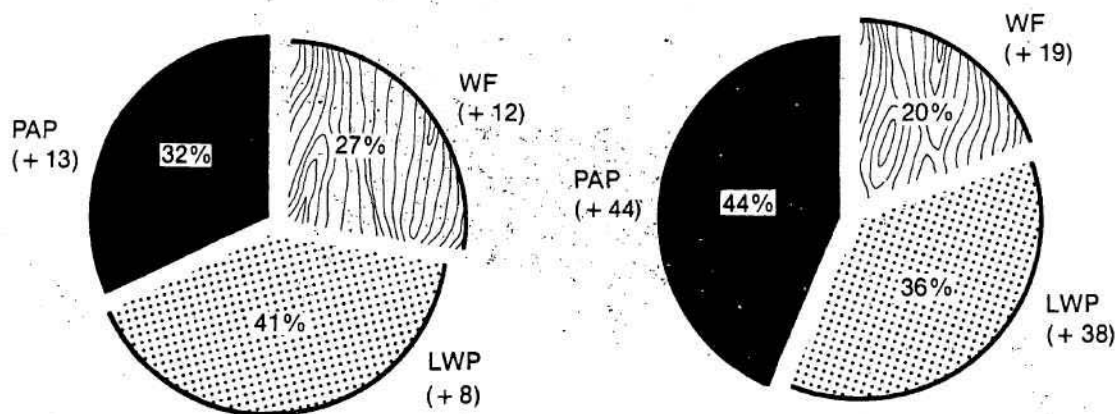
1980 Earnings—\$445 million



THE SOUTH

1980 Employment—620,567

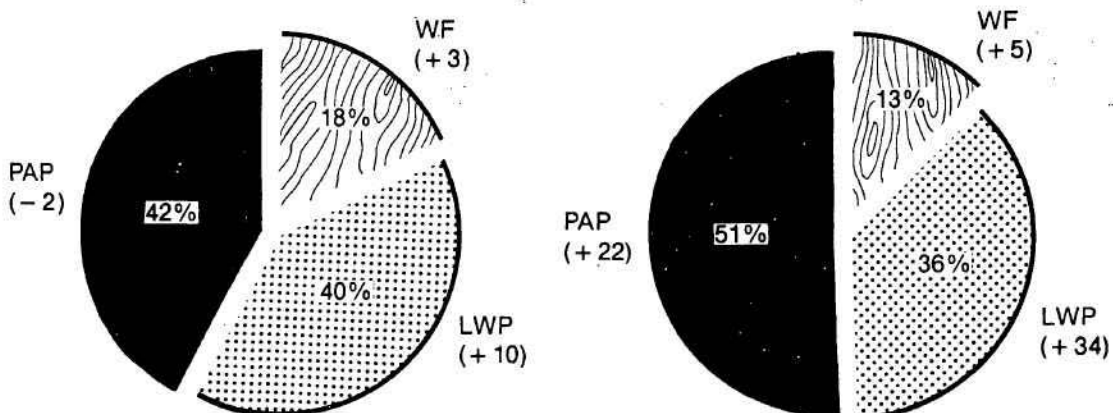
1980 Earnings—\$7.96 billion



UNITED STATES

1980 Employment—1,634,000

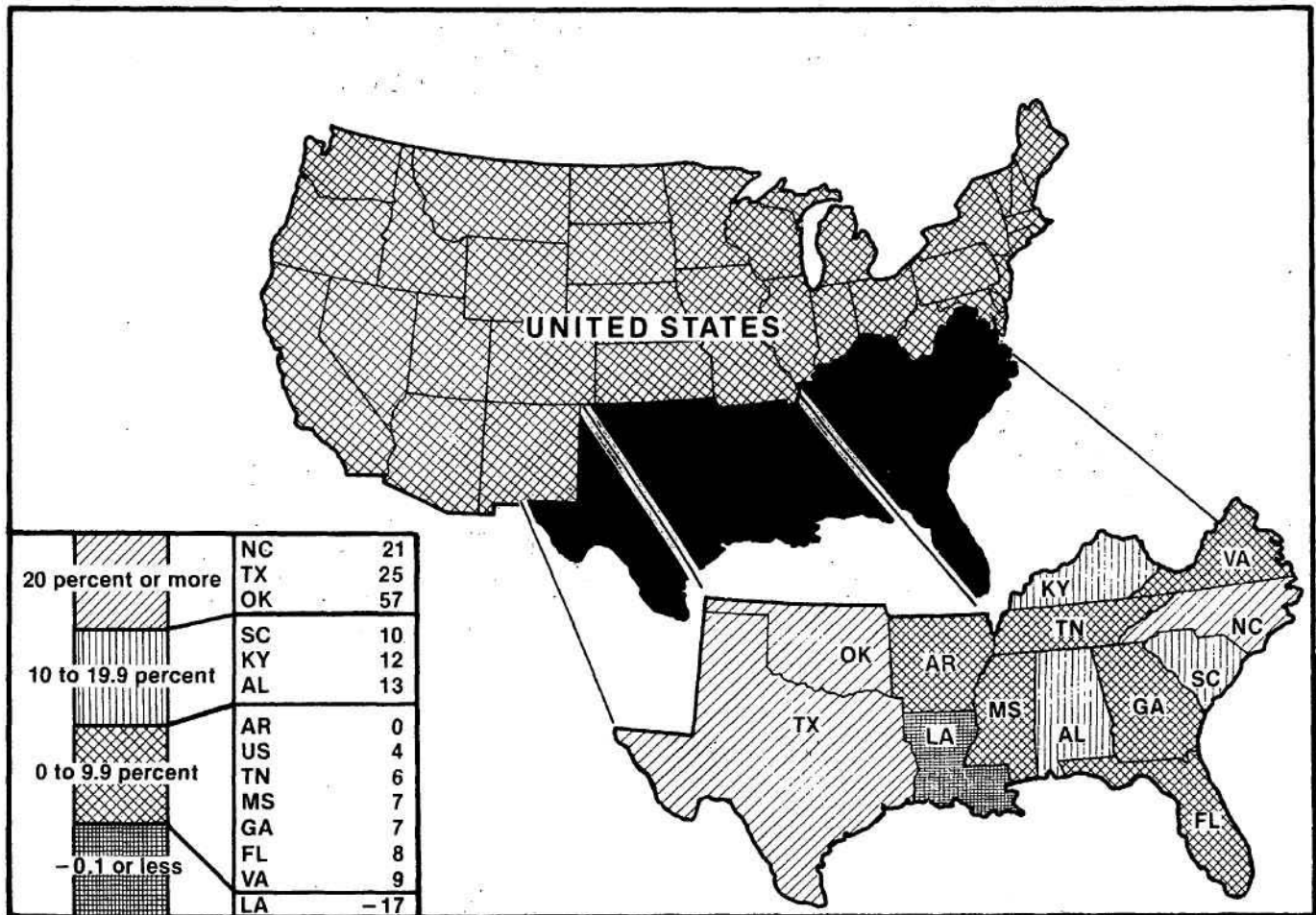
1980 Earnings—\$23.65 billion



Numbers in parentheses show percentage of change from 1970 to 1980. Earnings are expressed in constant 1977 dollars.

Growth of Employment

With the exception of Arkansas and Louisiana, forest products industry employment in each of the Southern States grew faster from 1970 to 1980 than did the U.S. counterpart. Employment in two States--Oklahoma and Texas--grew faster than the all-industry average of 22.3 percent. Employment growth in South Carolina's forest products industry was more than twice the national rate and ranked sixth among the 13 Southern States.

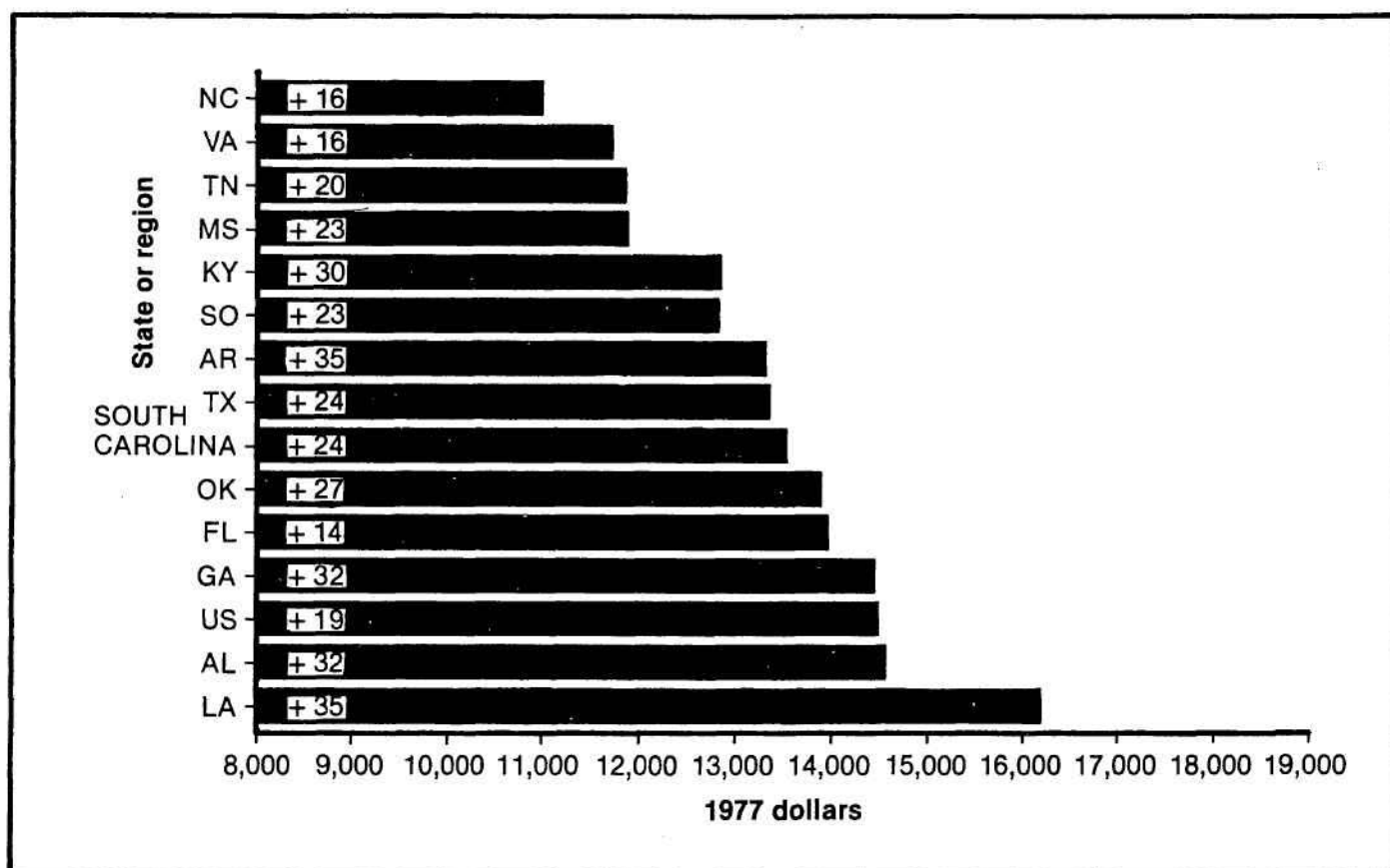


Average Annual Earnings

Average annual earnings per worker in the forest products industry differed significantly by State in 1980: Approximately \$5,000 separated the State with the highest earnings--Louisiana--from the State with the lowest--North Carolina. Pulp and allied products, which has traditionally paid higher wages than have other forest products industries, dominated Louisiana's forest products industry. Wood furniture, which has paid lower average wages, dominated North Carolina's industry.

Average annual earnings per worker in South Carolina's forest products industry were about 6 percent less than the industry's U.S. average. Between 1970 and 1980, South Carolina's rate of growth in earnings exceeded the rate for the United States. In average annual earnings per worker, South Carolina ranked sixth in the South. It ranked seventh in terms of growth.

Generally speaking, paper and allied products dominated the forest products industry in the States with highest average annual earnings. This relationship reflects higher job skills and unions in the paper industry. Wages, by and large, were the lowest in those States where the labor-intensive wood furniture was more important.



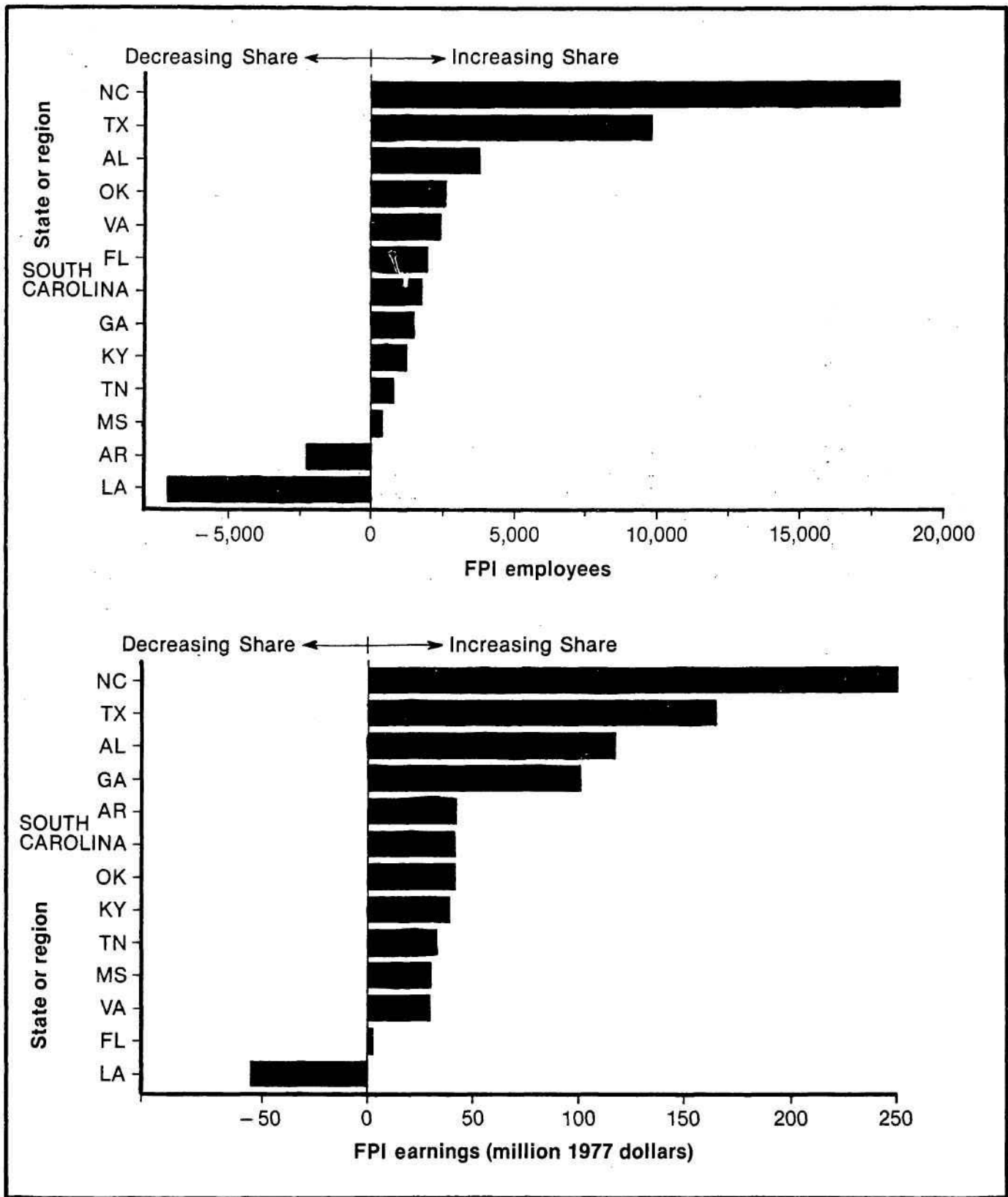
Numbers in bars show percentage of change from 1970 to 1980.

Shift in Employment and Earnings

The regional shift shows how much more or less employment and earnings a State would have had in the forest products industry in 1980 had the industry grown at the national rate. For example, South Carolina had approximately 1,700 more employees in 1980 than it would have had if its forest products industry had grown at the national rate.

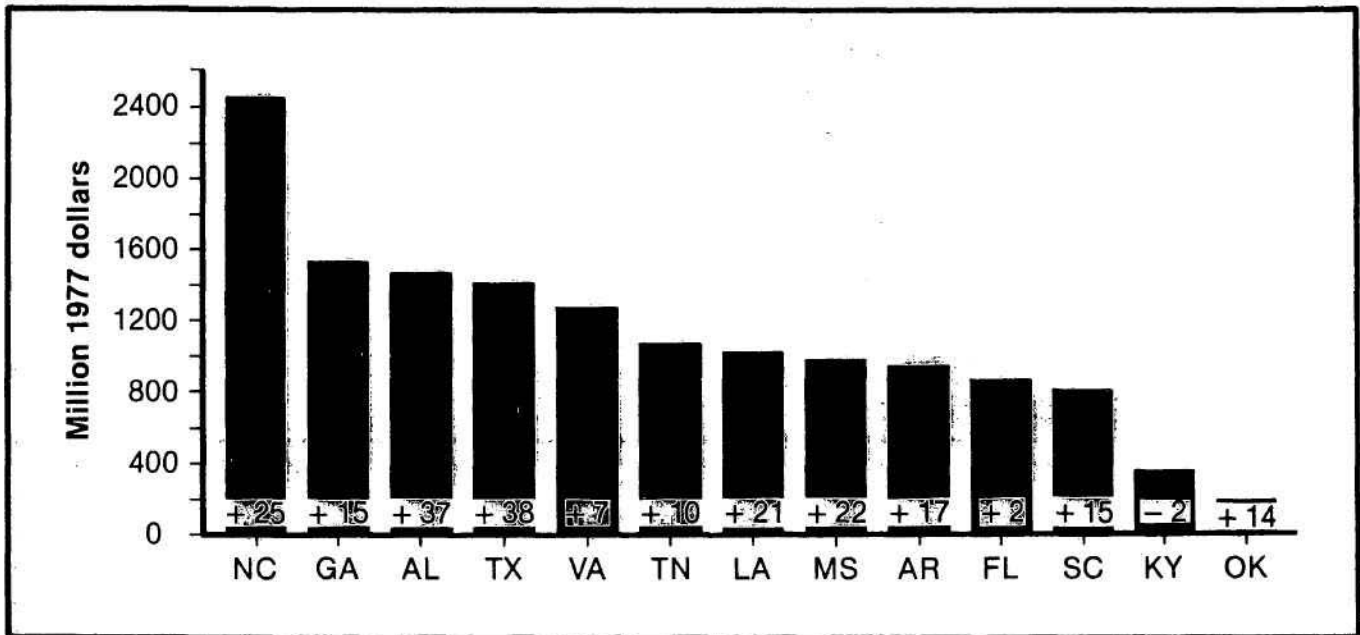
Between 1970 and 1980, total employment in the forest products industry increased in every Southern State except Louisiana and Arkansas. Moreover, all but these two States increased their share of the Nation's forest products industry employment; all but Louisiana increased their share of earnings.

Increased shares of employment and earnings reflect the comparative advantage the South's forest products industry enjoyed over this industry in the rest of the Nation. Several factors (for example, relatively lower labor costs, lower raw materials costs, and closer proximity to markets) might account for a region's comparative advantage, although adverse trends with respect to one factor need not reduce a region's advantage. In the case of the South, for instance, increasing labor costs need not adversely affect its comparative advantage if increased capital or labor productivity offsets higher labor costs.



**Value Added by the
Forest Products
Industry**

In 1977, the forest products industry of North Carolina produced more value added than that of any other State in the South. South Carolina was eleventh among the 13 southern States. Texas was not only one of the leading States in terms of total value added, it also led the South in terms of the change in value added between 1972 and 1977. One State, Kentucky, produced less value added in 1977 than in 1972.

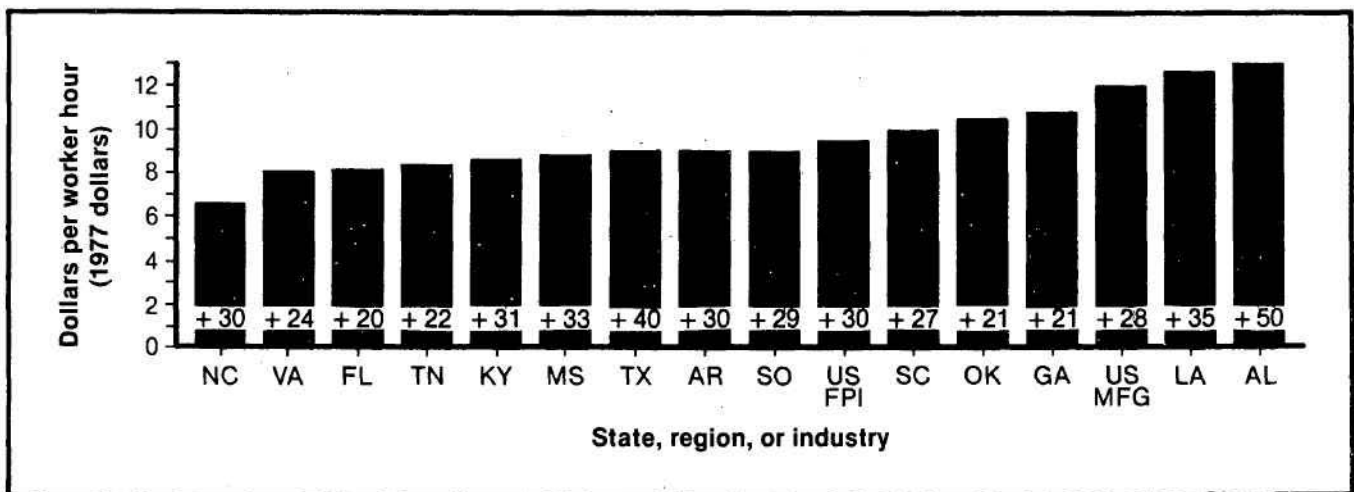


Numbers in bars show percentage of changes from 1972 to 1977.

Capital Productivity

Paper and allied products, which is more capital-intensive and, therefore, more susceptible to technological change than other forest products industries, exhibited the highest productivity within the forest products industry. Wood furniture, on the other hand, is the most labor-intensive of the three industry groups. North Carolina, for example, produced more value added than any other State in the South, but the productivity of its forest products industry in 1977 was the lowest. This reflects the dominant role of the labor-intensive wood furniture component in North Carolina.

Increases in productivity exceeded increases in payroll per worker between 1972 and 1977 for all the Southern States. This relationship is in part responsible for the South's comparative advantage in the forest products industry. The average productivity for all manufacturing industries exceeded that of the forest products industries in 11 of the 13 Southern States. But the forest products industries in five Southern States, including South Carolina, exceeded the average productivity for the Nation. Furthermore, the increase in productivity of the forest products industry in South Carolina nearly equaled that for all manufacturing.



Numbers in bars show percentage of change from 1972 to 1977.

Acknowledgment

Many helpful suggestions of several reviewers were incorporated in this research report. This project was funded in part by USDA Forest Service, Resource Program and Assessment Staff, and State and Private Forestry, Area Planning and Development, State Planning for Forest Resources.

Appendix 1 Tables

Table 1-Total labor and proprietorial employment and income, by industry, South Carolina, 1980^{1/}

Industry number	Industry	Employees	Total income
		Number	Thousand 1977 dollars ^{2/}
Wage and salary			
1	Agriculture	26,081	205,133
2	Agricultural services, forestry, and fisheries	6,728	54,549
3	Coal mining	^{1/}	576
4	Oil and gas extraction	10	269
5	Metal mining	0	0
6	Nonmetallic minerals	1,900	23,422
7	Construction	73,690	871,638
8	Food and kindred products	14,530	154,670
9	Tobacco	457	5,021
10	Textile mill production	137,534	1,464,589
11	Apparel and other textiles	46,543	325,043
12	Paper and allied products ^{3/}	14,188	252,474
13	Printing and publishing	7,447	79,914
14	Chemical and allied products	33,018	575,201
15	Petroleum refining	408	8,002
16	Rubber and miscellaneous plastics	17,729	279,677
17	Leather and leather products	118	1,428
18	Lumber and wood products except mobile homes ^{3/}	14,608	153,051
19	Mobile homes	79	828
20	Wood furniture ^{3/}	4,108	39,302
21	Other furniture and fixtures	682	6,525
22	Stone, clay, and glass products	10,968	151,590
23	Primary metals	7,563	129,604
24	Fabricated metals	14,376	188,375
25	Machinery, excluding electrical	31,630	424,719
26	Electrical machinery	21,952	248,302
27	Transportation equipment except motor vehicles	2,480	41,054
28	Motor vehicles	1,311	18,467
29	Ordnance	^{4/} --	^{4/} --
30	Instruments and related equipment	5,922	63,719
31	Miscellaneous manufacturing	4,804	44,924
32	Railroad transportation	4,075	81,161
33	Trucking and warehousing	14,707	220,635
34	Local transit	1,027	11,910
35	Air transportation	1,141	16,239
36	Pipeline transportation	55	921

See footnotes at end of table.

Table 1-Total labor and proprietorial employment and income, by industry, South Carolina, 1980^{1/} (continued)

Industry number	Industry	Employees	Total income
		<i>Number</i>	<i>Thousand 1977 dollars ^{2/}</i>
Wage and salary			
37	Transportation services	1,073	14,500
38	Water transportation	2,698	32,444
39	Communications	14,524	253,982
40	Electrical, gas, and sanitation services	13,840	243,636
41	Wholesale trade	49,945	695,674
42	Retail trade	175,497	1,245,586
43	Banking	13,778	141,970
44	Other credit agencies	8,483	99,120
45	Insurance	15,425	220,525
46	Real estate and combinations	10,282	118,474
47	Hotel and other lodging	14,768	94,653
48	Personal, miscellaneous business, and repair service	38,381	313,541
49	Auto repair service	5,841	67,900
50	Amusement	6,016	38,191
51	Motion pictures	1,166	5,309
52	Private households	47,189	109,449
53	Medical and other health	34,508	468,244
54	Private education	11,261	79,372
55	Nonprofit organizations	29,709	119,965
56	Miscellaneous services	13,026	320,180
57	Federal civilian	37,517	540,421
58	Federal military	86,048	648,044
59	State and local government	194,422	1,667,097
Proprietorial			
60	Farm proprietors	44,967	122,545
61	Nonfarm proprietors	86,731	649,448
	Total	1,478,964	14,453,207

^{1/}Source of data for this table for North Carolina, other States of the South, and the United States: unpublished data, U.S. Department of Commerce, Regional Economics Measurements Division, Regional Economic Information System (REIS), Washington, DC, 1982. Unpublished data used by the U.S. Department of Commerce in preparing their *County Business Patterns* (CBP) series on employment and payroll were used to differentiate wood-related from nonwood-related employment and earnings. For example, CBP data were used to separate mobile homes (no. 19) from the lumber and wood products (no. 18). Wood furniture (no. 20) was similarly separated from other furniture and fixtures (no. 21). Employment estimates for industry 3 (coal mining) were withheld to avoid disclosing data for individual companies.

^{2/} The Personal Consumption Expenditures (PCE) deflator, 1977 = 100, was used to deflate actual dollars.

^{3/} The forest products industry is comprised of (1) lumber and wood products (SIC 24), except mobile homes (SIC 2451); and (2) wood furniture manufacturing (SIC 2511, 2512, 2517, 2521, and 2541) and paper and allied products (SIC 26).

^{4/} Included with fabricated metals and other related industries.

Table 2--Dependency indexes for South Carolina, 1980

(In percent)

Industry	Employment		South Carolina excess employment ^{1/}	Dependency index ^{2/}
	South Carolina	United States		
Agriculture	2.11	1.46	0.65	2.86
Agricultural services, forestry, and fisheries	0.54	0.62	--	--
Farm proprietors	3.63	3.03	.60	2.67
Coal mining	0	.27	--	--
Oil and gas extraction	0	.60	--	--
Metal mining	0	.11	--	--
Nonmetallic minerals	.15	.14	.02	.07
Construction	5.96	4.74	1.21	5.35
Food and kindred products	1.17	1.87	--	--
Tobacco	.04	.07	--	--
Textile mill production	11.12	.93	10.18	44.98
Apparel and other textiles	3.76	1.39	2.37	10.49
Paper and allied products	1.15	.76	.39	1.73
Printing and publishing	.60	1.37	--	--
Chemical and allied products	2.67	1.22	1.45	6.40
Petroleum refining	.03	.22	--	--
Rubber and miscellaneous plastics	1.43	.80	.64	2.81
Leather and leather products	.01	.26	--	--
Lumber and wood products, except mobile homes	1.18	.71	.47	2.08
Mobile homes	.01	.05	--	--
Wood furniture	.33	.32	.01	.04
Other furniture and fixtures	.06	.19	--	--
Stone, clay, and glass products	.89	.73	.16	.69
Primary metals	.61	1.26	--	--
Fabricated metals	1.16	1.77	--	--
Machinery, excluding electrical	2.56	2.73	--	--
Electrical machinery	1.77	2.31	--	--
Transportation equipment except motor vehicles	.20	1.21	--	--
Motor vehicles	.11	.87	--	--
Ordnance	0	0	0	0
Instruments and related equipment	.48	.77	--	--
Miscellaneous equipment	.39	.47	--	--
Railroad transportation	.33	.58	--	--
Trucking and warehousing	1.19	1.40	--	--
Local transit	.08	.29	--	--
Air transportation	.09	.50	--	--
Pipeline transportation	0	.02	--	--
Transportation services	.09	.22	--	--
Water transportation	.22	.23	--	--
Communications	1.17	1.48	--	--
Electrical, gas, and sanitation services	1.12	.90	.22	.95
Wholesale trade	4.04	5.79	--	--

See footnotes at end of table.

Table 2--Dependency indexes for South Carolina, 1980 (continued)

(In percent)

Industry	Employment		South Carolina excess employment ^{1/}	Dependency index ^{2/}
	South Carolina	United States		
Retail trade	14.18	16.50	--	--
Banking	1.11	1.72	--	--
Other credit agencies	.69	.99	--	--
Insurance	1.25	1.89	--	--
Real estate and combinations	.83	1.16	--	--
Hotel and other lodging	1.19	1.20	--	--
Personal, miscellaneous business, and repair services	3.10	4.69	--	--
Auto repair service	.47	.63	--	--
Amusement	.49	.84	--	--
Motion pictures	.09	.24	--	--
Medical and other health	2.79	5.71	--	--
Private education	.91	1.47	--	--
Nonprofit organizations	2.40	3.01	--	--
Miscellaneous services	1.05	1.63	--	--
Federal civilian	3.03	3.27	--	--
Federal military	6.95	2.68	4.27	18.88
Nonfarm proprietors	7.01	7.66	--	--
Total ^{3/}	100.00	100.00	22.64	100.00

^{1/} U.S. employment minus South Carolina employment. Figures may not be exactly equal to South Carolina minus U.S. because of rounding. Dashes signify no excess employment.

^{2/} Individual industry excess employment expressed as a percentage of South Carolina's total excess employment (sum of column 4).

^{3/} Sum of parts may not equal totals because of rounding.

Table 3--Value added, hours worked, payroll, and capital productivity, ^{1/} South Carolina forest products industry, 1977^{2/}

Industry	Value added	Payroll	Hours worked	Productivity	Productivity change, 1972-77
	--- \$ Million ---		Million	\$VAMP per hour	Percent
Lumber and wood products	288.8	122.9	23.0	7.21	37.62
Wood furniture	53.8	27.2	5.8	4.59	0.44
Paper and allied products	463.5	180.2	19.3	14.68	23.65

^{1/} Productivity equals value added minus payroll (VAMP), divided by hours worked. For a discussion of VAMP, see W. Charles Sawyer and Joseph A. Ziegler, 1980, "The use of VAMP shift as a predictive model." Unpublished paper presented at the annual meeting of the Western Regional Science Association, Monterey, California.

^{2/} Source: U.S. Bureau of the Census, Census of Manufacturing, for 1972 and 1977, South Carolina and the United States, available in 1976 and 1980, respectively. In the few instances where data were not available for some subindustry sectors, the distribution of the number of establishments was used to estimate nondisclosures.

Appendix 2
South Carolina Counties
by Substate Planning
and Development
Districts

District code	Counties
1	Anderson, Cherokee, Greenville, Oconee, Pickens, Spartanburg
2	Abbeville, Edgefield, Greenwood, Laurens, McCormick, Saluda
3	Chester, Lancaster, Union, York
4	Fairfield, Lexington, Newberry, Richland
5	Aiken, Allendale, Bamberg, Barnwell, Calhoun, Orangeburg
6	Clarendon, Kershaw, Lee, Sumter
7	Chesterfield, Darlington, Dillon, Florence, Marion, Marlboro
8	Georgetown, Horry, Williamsburg
9	Berkeley, Charleston, Dorchester
10	Beaufort, Colleton, Hampton, Jasper

Maki, Wilbur R.; Schallau, Con H; Foster, Bennett B.; Redmond, Clair H.

South Carolina's forest products industry: performance and contribution to the State's economy, 1970 to 1980. Res. Pap. PNW-351. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: **1986**. 22 p.

Employment and earnings in South Carolina's forest products industry, like those of most Southern States, grew significantly between 1970 and 1980. The forest products industry accounted for a larger share of the State's economic base in 1980 than in 1970. Moreover, during this period, the State increased its share of the Nation's forest products industry employment and earnings. Pulp and allied products had the highest productivity, but lumber and wood products experienced the largest increase in productivity between 1972 and 1977.

Keywords: Forest products industries, economics (forest products industries), South Carolina.

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