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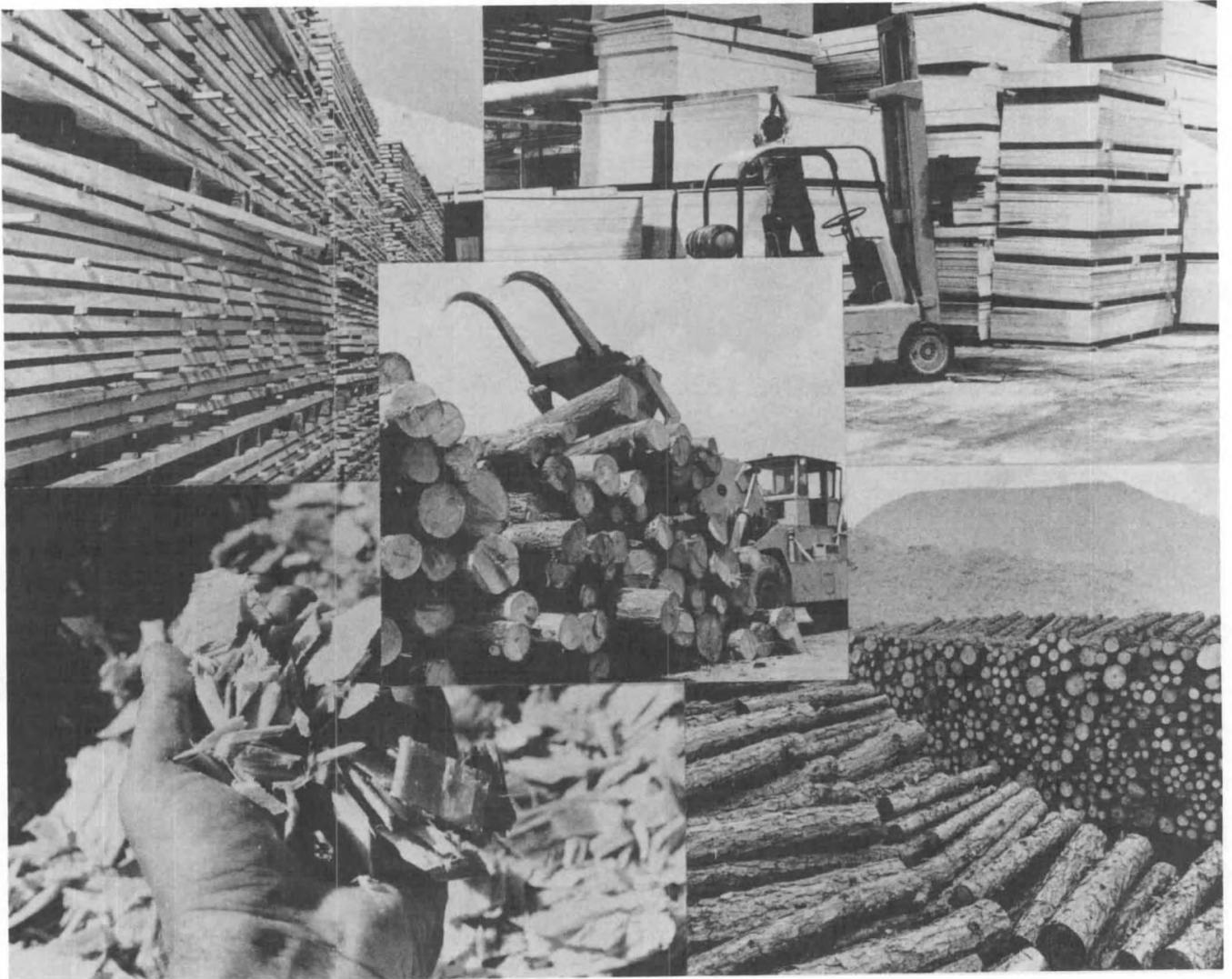
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LOUISIANA'S Forest Products Industry: Performance and Contribution to the State's Economy, 1970 to 1980

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 Louisiana
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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Louisiana's forest products industry: performance and contribution to the State's economy, 1970 to 1980. Res. Pap. PNW-RP-371. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station; 1986. 22 p.

Employment in Louisiana's forest products industry, unlike employment in the other 12 Southern States, decreased significantly between 1970 and 1980. Despite this decrease, the value added by the industry increased. The productivity of Louisiana's forest products industry ranked second among the 13 States in the South. In 1980, lumber and wood products accounted for the largest share of the industry's employment, but paper and allied products had a larger share of the earnings. In 1977, paper and allied products had higher productivity than either lumber and wood products or wood furniture.

Keywords: Forest products industries, employment (forest products industries), Louisiana.

Preface

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

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

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.

Highlights

- Between 1970 and 1980, employment in Louisiana in the forest products industry declined by 17 percent. This decrease reflects increased technology in paper and allied products; the closure of older, more labor-intensive sawmills; and a shakeout in the southern pine plywood industry.
- Despite a reduction in employment, value added by the forest products industry increased substantially between 1972 and 1977.
- The forest products industry is one of the basic industries in Louisiana. As the importance of the oil industry grew between 1970 and 1980, the relative importance of the forest products industry declined. More recently, OPEC (Organization of Petroleum Exporting Countries) oil prices have declined and domestic exploration for and production of oil have declined significantly in Louisiana. Consequently, the importance of the forest products industry has probably increased since 1980.
- In 1977, productivity of the forest products industry in Louisiana was exceeded in the South only by Alabama. Between 1972 and 1977, productivity increased by 35 percent. This increase—third highest in the South—was achieved despite average annual wages in Louisiana being the region's highest.

- Generally speaking, the forest products industry is more important in the northern half of the State than elsewhere. For example, the forest products industry accounts for 25 percent of the economic base (that is, those industries producing for export to other States and the rest of the world) in the Monroe area, whereas the industry does not qualify as basic in the New Orleans area.
- In 1980, lumber and wood products employed the largest share of the approximately 28,000 workers in the State's forest products industry. Paper and allied products had the largest share of 1980 earnings.
- Average annual earnings in the forest products industry in Louisiana were greater than average earnings in any other State in the South and greater than the average for the United States. Furthermore, earnings increased faster in Louisiana than in either the South or the Nation.

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**The Forest Products
Economy of
Louisiana
The State's Work Force**

Louisiana's estimated full- and part-time work force in 1980 was comprised of an estimated 1.8 million employees and proprietors (see appendix 1 for sources of employment and earnings data). Louisiana's work force grew considerably faster between 1970 and 1980 than did the national average (33.8 versus 22.3 percent). Total earnings—wage and salary payments and proprietorial income—grew much faster than the national average. Measured in constant 1977 dollars, the State's earnings increased by 57.6 percent compared with 27.4 percent for the Nation. As can be seen in the following tabulation, services, State and local government, retail trade, and manufacturing were the State's four largest employer categories.

Employers	Percent of total employment, 1980	
	Louisiana	U.S.
Major industries:		
Services	17.75	18.22
State and local government	14.32	12.56
Retail trade	13.84	14.18
Manufacturing (including forest products industry ^{1/})	11.49	19.15
Construction	7.45	4.08
Transportation, communication, and public utilities	6.73	4.84
Nonfarm proprietors	5.75	6.58
Wholesale trade	5.54	4.97
Mining	4.81	0.97
Finance, insurance, and real estate	4.02	4.95
Agriculture	4.02	4.39
Federal military	2.38	2.30
Federal civilian	1.90	2.81
Total	100.00	100.00

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

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 Louisiana'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 area's economic base. Generally speaking, most manufacturing employment is classified as economic base (or basic); residentiary employment (for example, barber shops, realty firms, schools, and local government) is primarily geared to producing for local needs. Some services may, however, be basic. For example, Federal military provides national defense for all the Nation's citizens, and taxpayers outside Louisiana provide financial support for this activity.

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 on the success of its economic base.

We used the excess employment technique to identify the industries that comprise Louisiana's (or a sub-State 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 sub-State district) and is part of Louisiana's economic base. The percentage of Louisiana's excess employment served as an indicator of the State's dependency on a particular industry for generating new dollars from outside the State (table 2 shows how excess employment and industry dependency indicators for Louisiana were calculated).

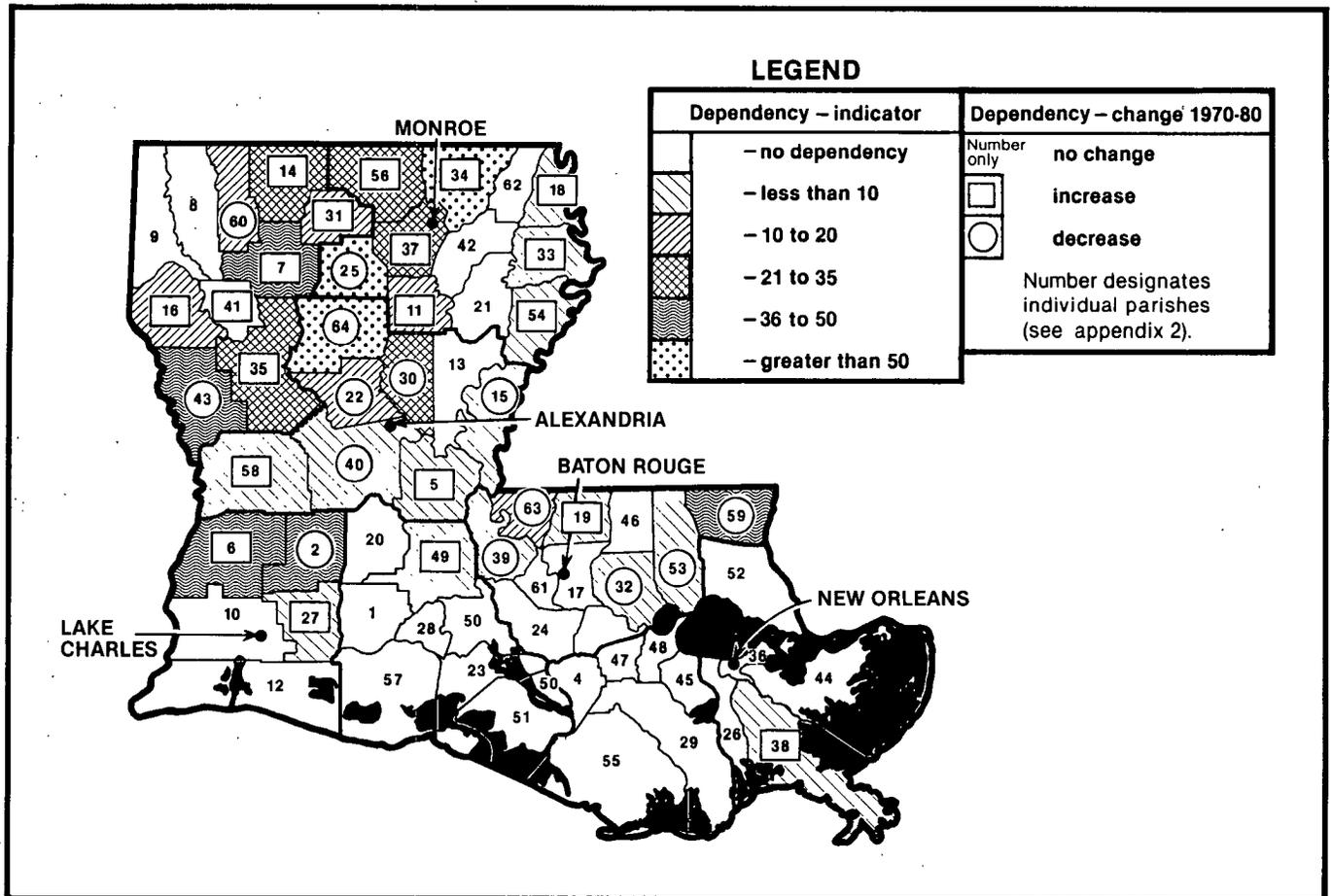
In 1980, 10 industries accounted for 94.5 percent of the State's excess employment—that is, its economic base (see tabulation below). These same industries accounted for only 82.7 percent in 1970. Furthermore, the change in shares of certain individual industries is noteworthy. In 1970, five energy-related industries—oil and gas extraction, construction, water transportation, chemical and allied products, and oil refining—accounted for about 60 percent of the State's basic employment. By 1980, they accounted for nearly 80 percent. Meanwhile, the importance of agriculture changed substantially, but in the opposite direction. Agriculture was not a basic industry in 1980; in 1970 it accounted for about 10 percent of the State's economic base employment. The relative importance of the forest products industry and Federal military components of the economic base also declined between 1970 and 1980.

More recently, OPEC (Organization of Petroleum Exporting Countries) oil prices have declined, and domestic exploration for and production of oil have declined significantly in Louisiana. Consequently, the importance of the forest products industry has probably increased since 1980.

<u>Economic base industries</u>	<u>Dependency indicator</u>	
	<u>1970</u>	<u>1980</u>
	(Percent of economic base)	
Oil and gas extraction	26.36	30.42
Construction	12.61	26.26
Water transportation	13.16	14.27
Wholesale trade	5.60	5.75
Chemical and allied products	4.38	5.65
Transportation equipment, excluding motor vehicles	1.68	3.60
Petroleum refining	3.94	3.22
Electrical, gas, and sanitation services	1.47	2.06
Forest products	7.40	2.00
Federal military	6.07	1.29
Agriculture	<u>10.60</u>	<u>—</u>
Subtotal	93.27	94.52
All other industries	<u>6.73</u>	<u>5.48</u>
Total	100.00	100.00

Geographical Importance of the State's Forest Products Industry

The contribution of the forest products industry to Louisiana's economic base varies considerably among parishes (see appendix 2 for a list of parishes). Furthermore, between 1970 and 1980, the importance of the industry increased in most parishes in the northern half of the State but declined elsewhere.



Source: 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 designate parishes as coded and shown in appendix 2.

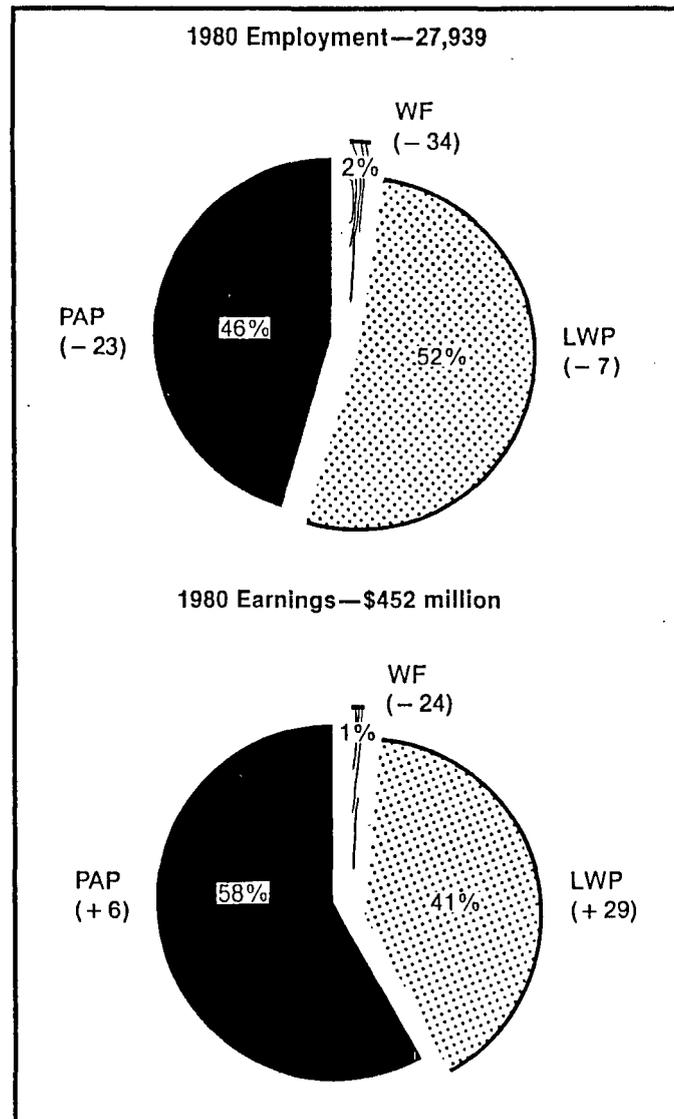
Composition of the State's Forest Products Industry

Louisiana's forest products industry is comprised of paper and allied products, lumber and wood products (not including mobile homes), and wood furniture manufacturing. Employment decreased in all three segments between 1970 and 1980. This decrease reflects increased technology in the paper and allied products (that is, the installation of more capital-intensive equipment); the closure of older, more labor-intensive saw-mills; and a shakeout in the southern pine plywood industry.^{2/}

In 1980, lumber and wood products employed the largest share of the approximately 28,000 workers in Louisiana's forest products industry. Paper and allied products had the largest share of 1980 earnings.

Whereas employment dropped appreciably throughout the industry, earnings increased between 1970 and 1980 in the paper and allied products and lumber and wood products segments. The wood furniture segment is the smallest; during the 1970's, its employment declined by a third while earnings declined by nearly 25 percent.

^{2/}Cleaves, David A.; O'Laughlin, Jay. Forest inventory, plant location and company strategies. In: Proceedings of the 1985 Southern forest economic workers (SOFEW) workshop; 1985 March 13-15; Athens, GA. Athens GA: University of Georgia; 1985: 35-43.

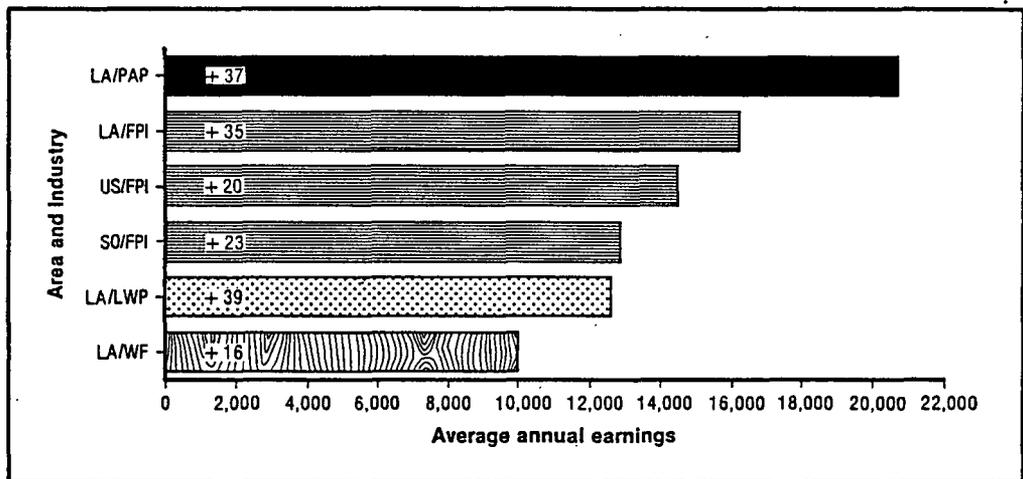


Numbers in parentheses show percentage of change from 1970 to 1980.

Average Annual Earnings per Worker

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

The rate of growth in earnings was greater for Louisiana's forest products industry than for the South and the Nation. The difference resulted from the growth in earnings of the paper and allied products and lumber and wood products segments. The rate of change for wood furniture was less than that of the Nation and the South.

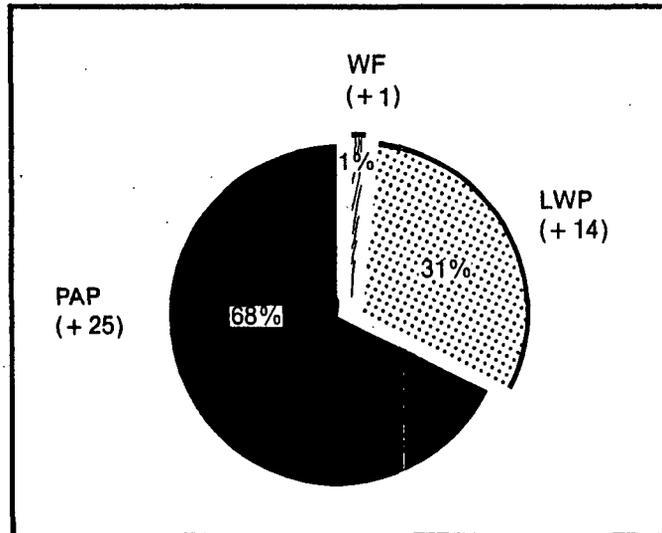


Numbers in bars show percentage of change from 1970 to 1980.

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 includes only the economic contributions of the State's forest products industry. Consequently, value added by manufacturing is considered a better monetary gauge of the relative economic importance of a manufacturing industry. In 1977, paper and allied products accounted for 68 percent of the \$1.02 billion of value added by Louisiana's forest products industry.

Value added by the forest products industry increased substantially between 1972 and 1977 despite declining employment. Overall, value added increased by 21 percent; paper and allied products experienced the most growth and wood furniture the least.



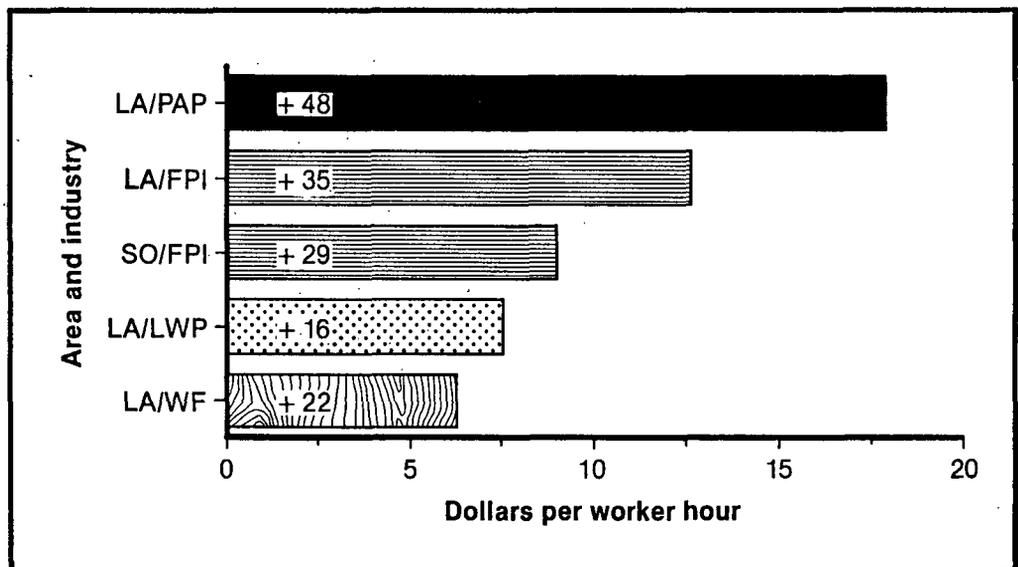
Numbers in parentheses show percentage of change from 1972 to 1977.

Capital Productivity

Increases in productivity are necessary for an industry to remain competitive in the marketplace. 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 productivity was calculated for Louisiana's forest products industry). This measure of productivity represents profits before taxes and adjusts for wide differences in payroll among industries.

Paper and allied products had by far the highest productivity in Louisiana's forest products industry. Productivity per worker hour was almost 40 percent greater than the average for the State's forest products industry.

Paper and allied products is more capital intensive and in the past has attracted considerable investment in new facilities and equipment. As a result, productivity in paper and allied products increased despite increased labor costs. During the mid-1970's, this segment exhibited a much larger gain in productivity than did the average for the South.

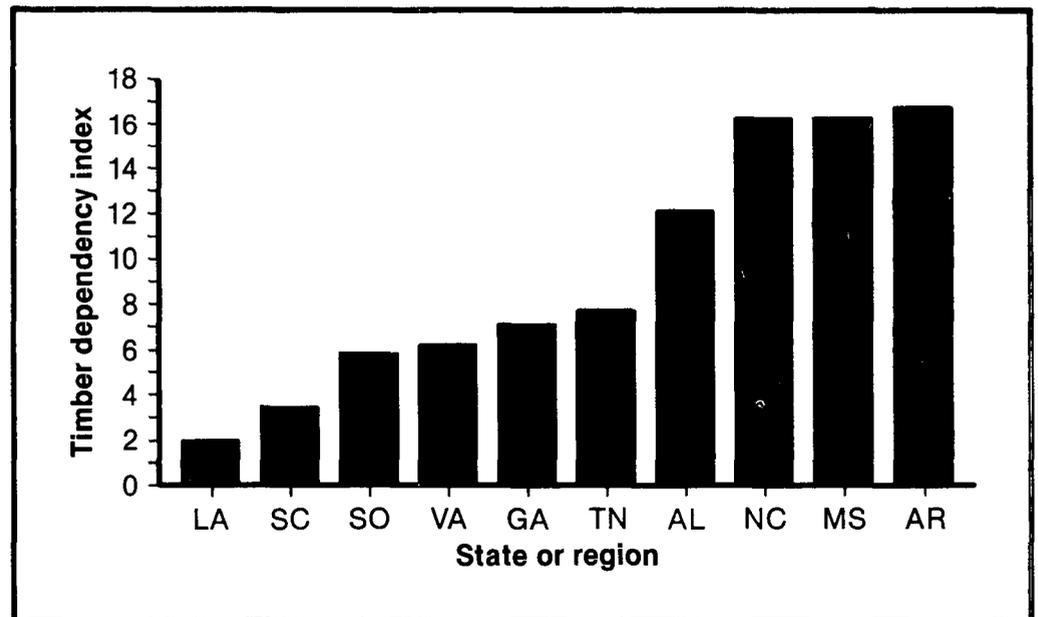


Numbers in bars show percentage of change from 1972 to 1977.

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

The dependency indicators suggest that in 1980 all but four States in the South manufactured forest products in excess of statewide needs. Oil and gas extraction, and the petrochemical industry dominate Louisiana's economy. Consequently, Louisiana is not as timber-dependent as most Southern States.

Florida, Kentucky, Oklahoma, and Texas were not self-sufficient with respect to forest products. That is, these States imported more forest products than they exported. Consequently, on net balance, their respective forest products industries did not generate new dollars from the outside. In three States—Arkansas, Mississippi, and North Carolina—the forest products industry accounts for approximately one of six basic employees. In Louisiana, 1 out of 50 basic jobs is in the forest products industry.



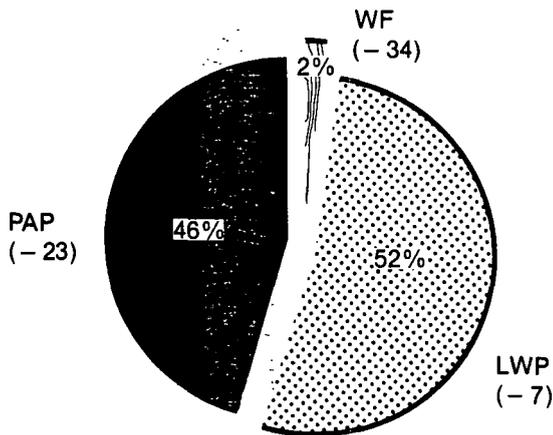
Industry Composition

Both the paper and allied products and lumber and wood products segments accounted for larger shares of 1980 employment and earnings in Louisiana's forest products industry than they did for either the South or the Nation. Unlike other Southern States, employment decreased in Louisiana during the 1970's.

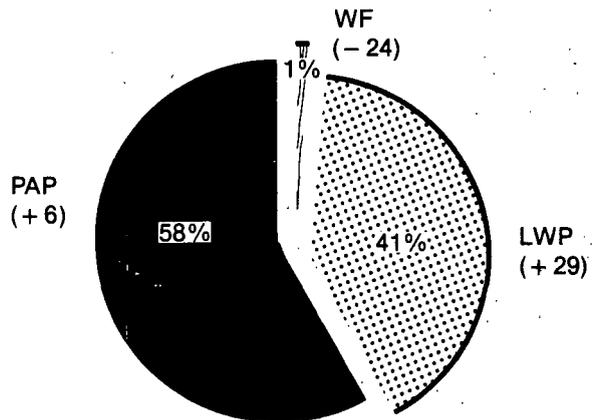
Wood furniture is much less important in Louisiana than in the South or the Nation. Furthermore, this segment's earnings and employment declined.

LOUISIANA

1980 Employment—27,939

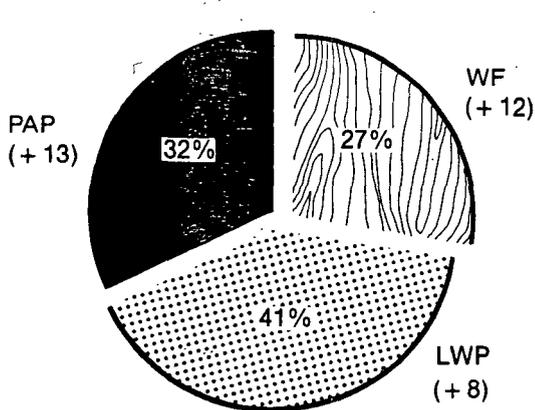


1980 Earnings—\$452 million

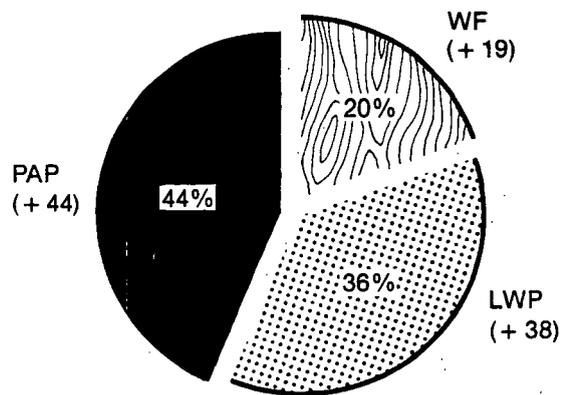


THE SOUTH

1980 Employment—620,567

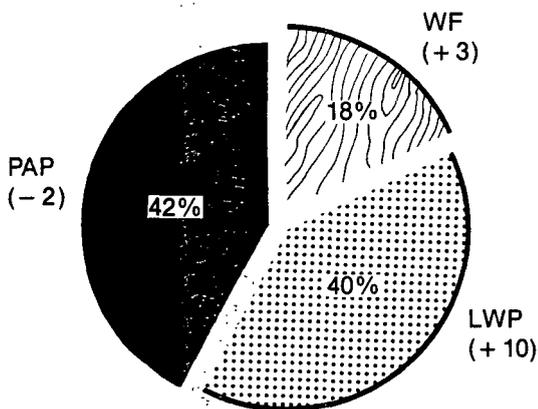


1980 Earnings—\$7.96 billion

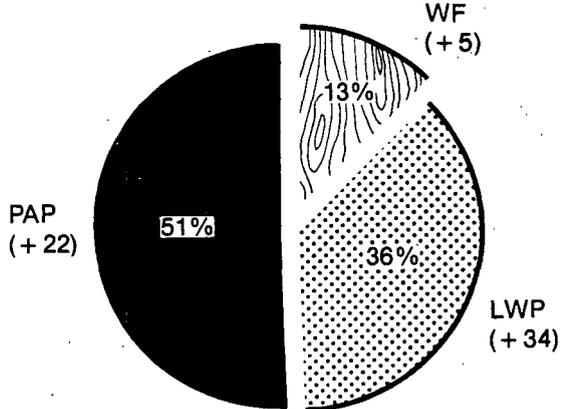


UNITED STATES

1980 Employment—1,634,000



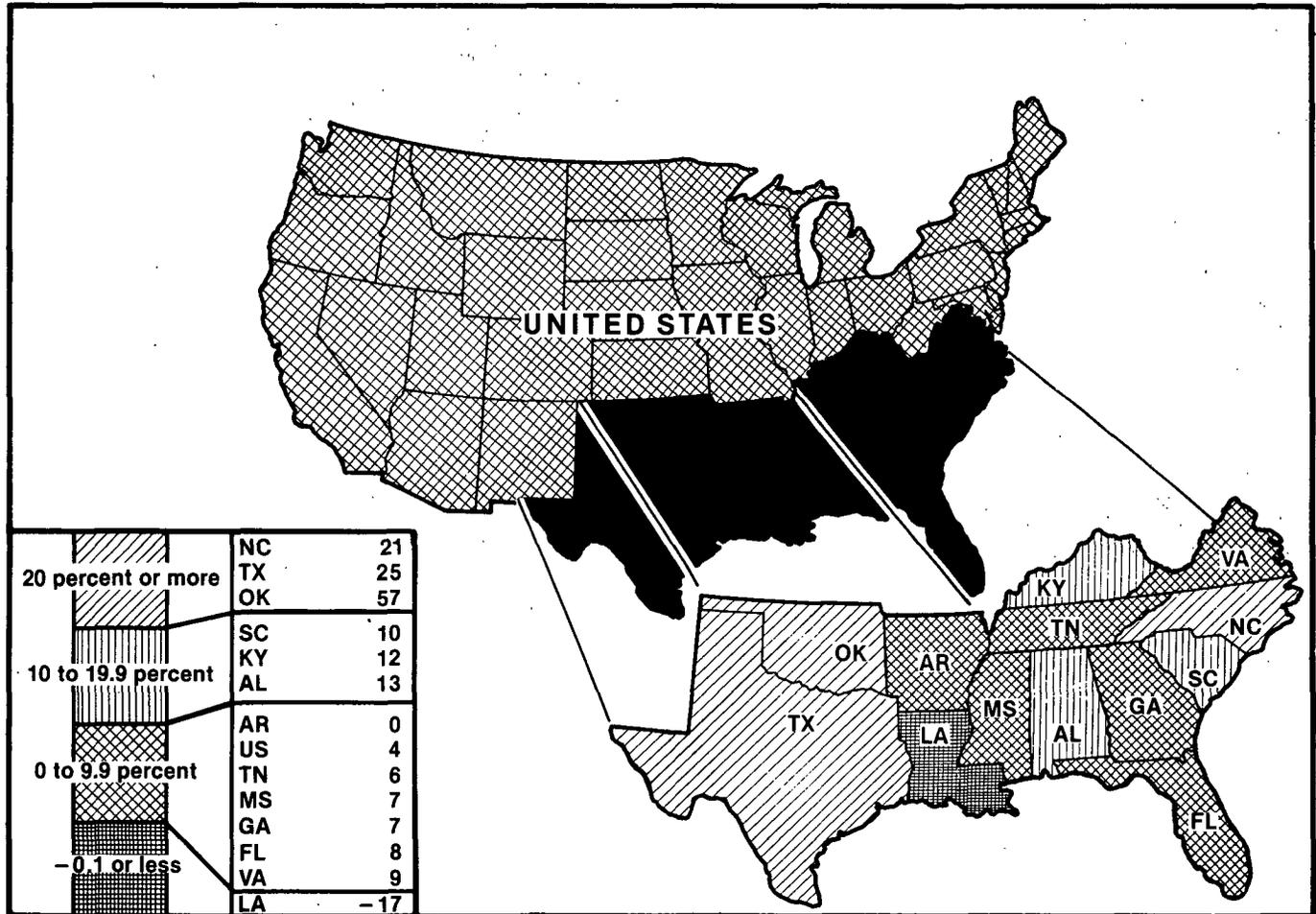
1980 Earnings—\$23.65 billion



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

Growth of Employment

With the exceptions of Arkansas and Louisiana, employment in the forest products industry in each of the Southern States grew faster than did the U.S. counterpart. Between 1970 and 1980, employment in Oklahoma and Texas grew faster than the all-industry average of 22.3 percent.

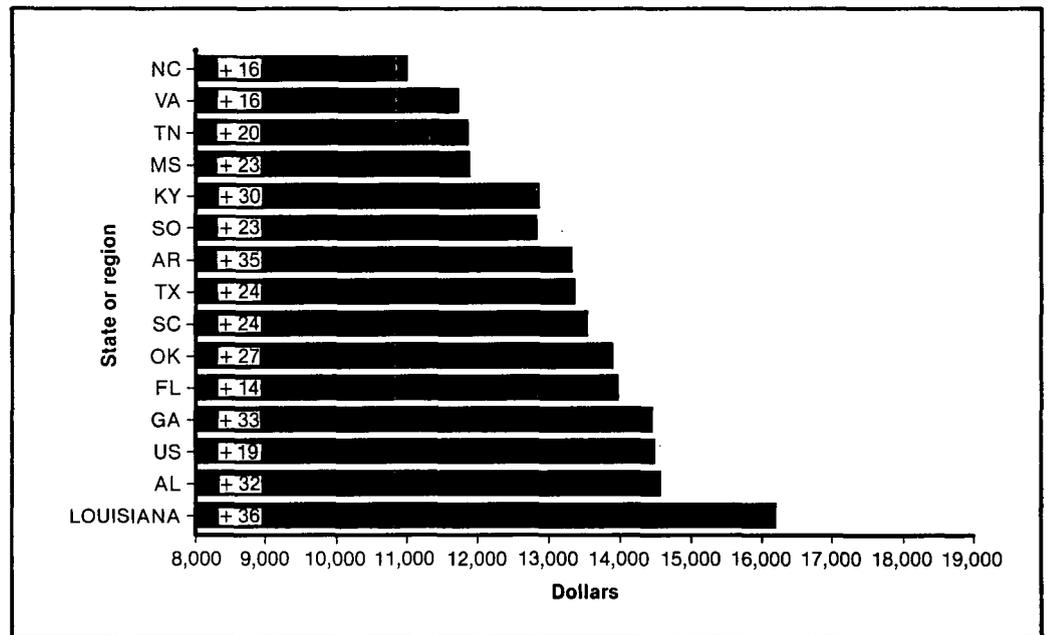


Average Annual Earnings

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 (Louisiana) from the State with the lowest (North Carolina). Pulp and allied products manufacturing, which has traditionally paid higher wages than have other segments of the forest products industry, dominated Louisiana's forest products industry. Wood furniture, which has paid lower average wages, dominated North Carolina's industry.

Average annual earnings in the forest products industry in Louisiana were greater than average annual earnings in any other Southern State and greater than the average for the United States. Furthermore, earnings increased faster in Louisiana than in either the South or the Nation.

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



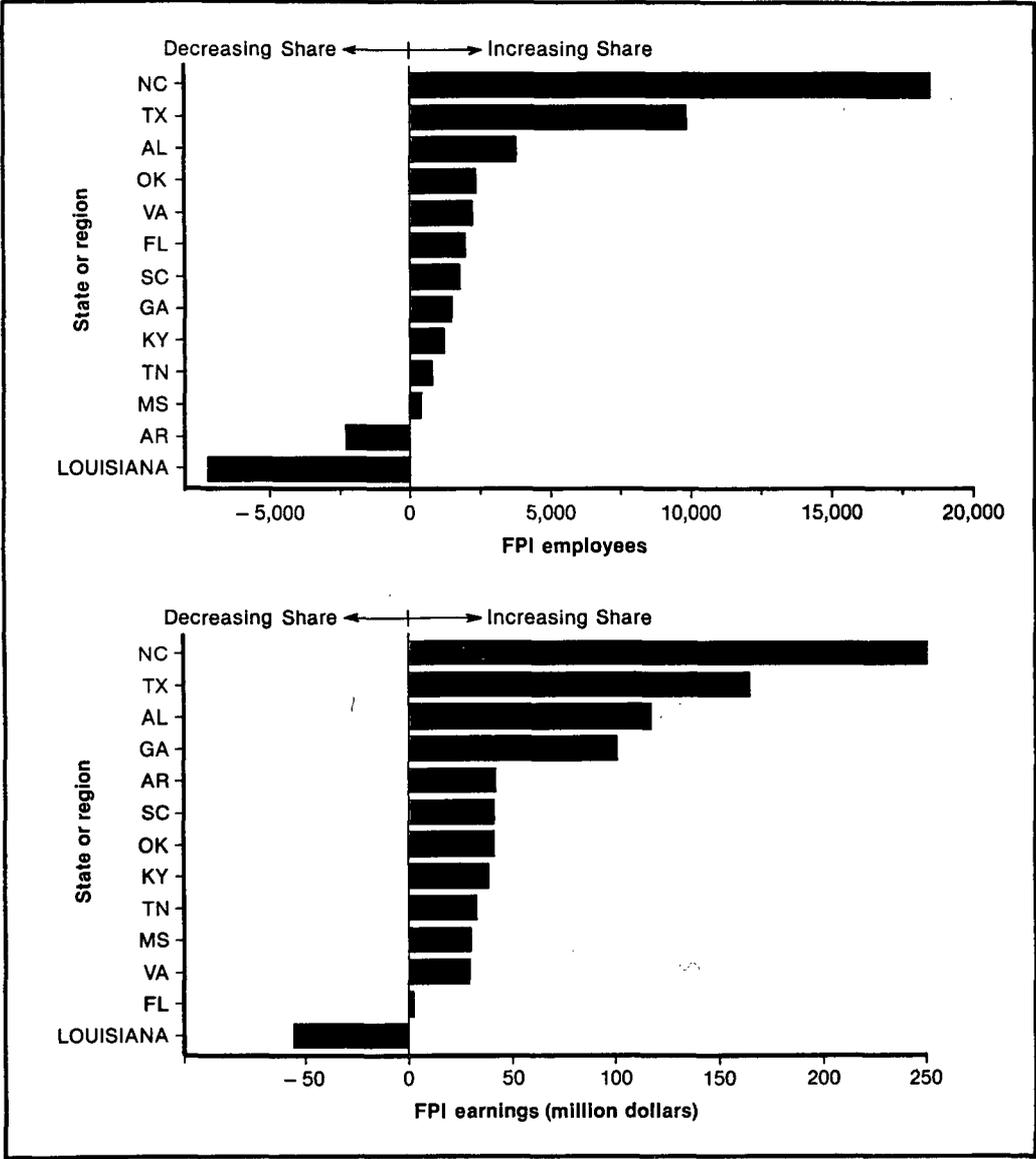
Numbers in bars show percentage of change from 1970 to 1980.

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 it grown at the national rate. For example, Louisiana had about 7,200 fewer employees in 1980 than it would have had if its forest products industry had grown at the national rate.

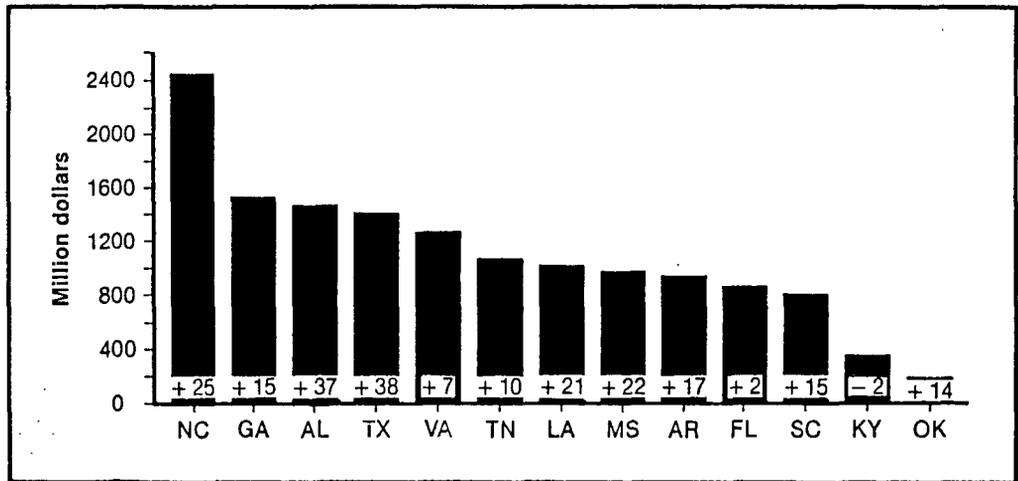
Between 1970 and 1980, employment in the forest products industry increased in every Southern State except Louisiana and Arkansas. Moreover, all but these two States increased their share of the Nation's forest products industry employment, and all but Louisiana increased their share of earnings.

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. For instance, increasing labor costs need not adversely affect the South's 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 any other State in the South. Georgia was second among the 13 Southern States; Louisiana was seventh. Texas not only was one of the leading States in terms of total value added but also led the South in terms of the change in value added between 1972 and 1977. Louisiana was one of only five Southern States whose change in value added exceeded that for the region (19 percent). One State, Kentucky, produced less value added in 1977 than in 1972. This can be attributed to the decline in secondary processing during the 1970's.



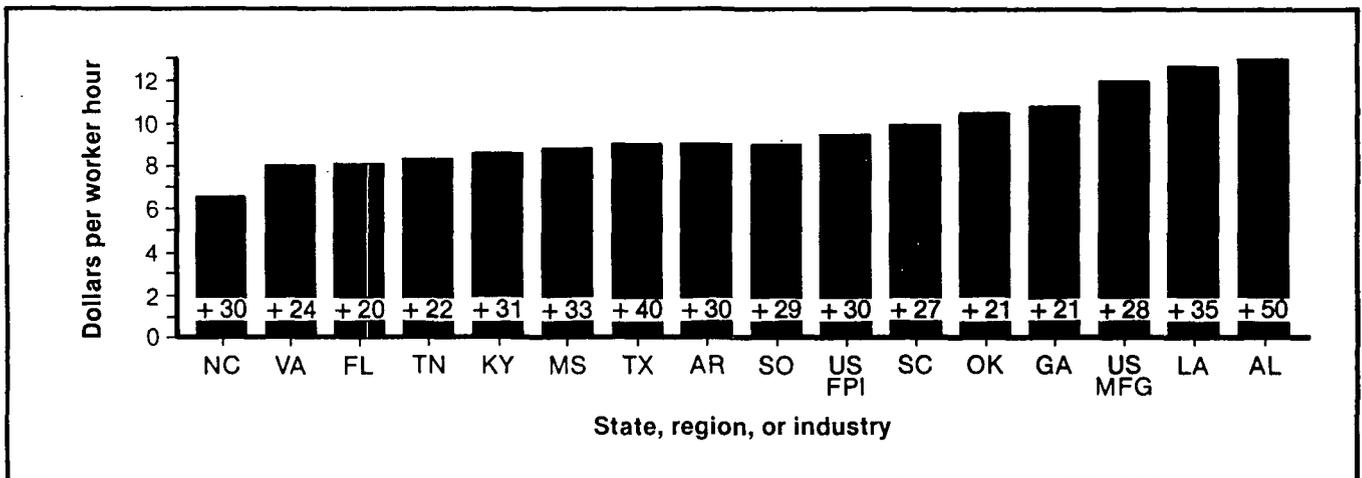
Numbers in bars show percentage of change from 1972 to 1977.

Capital Productivity

The paper and allied products segment, which is more capital-intensive and, therefore, more susceptible to technological change than are other segments of the forest products industry, exhibited the highest productivity within the forest products industry. Wood furniture, on the other hand, is the most labor-intensive of the three. 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 labor-intensive wood furniture manufacturing 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.

In 1977, productivity of Louisiana's forest products industry was second highest of the 13 Southern States. Between 1972 and 1977, productivity increased by 35 percent. This increase—third highest in the South—was achieved despite the fact that Louisiana's average annual wages were the region's highest.



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

Acknowledgment

Many helpful suggestions of several reviewers were incorporated in this research paper. This project was partially funded by the USDA Forest Service Resource Program and Assessment Staff, 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, Louisiana, 1980^{1/}

Industry number	Industry	Employees	Total income
		<i>Number</i>	<i>Thousand 1977 dollars^{2/}</i>
Wage and salary			
1	Agriculture	21,365	323,565
2	Agricultural services, forestry, and fisheries	6,858	91,734
3	Coal mining	—	—
4	Oil and gas extraction	85,236	1,734,745
5	Metal mining	—	—
6	Nonmetallic minerals	3,983	64,694
7	Construction	138,092	2,216,020
8	Food and kindred products	26,640	324,563
9	Tobacco	—	—
10	Textile mill production	2,101	18,023
11	Apparel and other textiles	11,072	76,313
12	Paper and allied products	12,733	262,630
13	Printing and publishing	9,236	105,005
14	Chemical and allied products	32,734	773,937
15	Petroleum refining	13,074	397,847
16	Rubber and miscellaneous plastics	1,914	31,767
17	Leather and leather products	198	1,286
18	Lumber and wood products, excluding mobile homes	14,668	184,441
19	Mobile homes	584	7,343
20	Wood furniture	538	5,356
21	Other furniture and fixtures	335	3,335
22	Stone, clay, and glass products	8,600	124,563
23	Primary metals	7,672	162,002
24	Fabricated metals	17,016	280,715
25	Machinery, excluding electrical	12,466	214,757
26	Electrical machinery	10,714	162,995
27	Transportation equipment, excluding motor vehicles	27,537	486,850
28	Motor vehicles	765	13,307
29	Ordnance	^{3/}	^{3/}
30	Instruments and related equipment	1,038	14,037
31	Miscellaneous manufacturing	1,325	14,188
32	Railroad transportation	8,045	168,884
33	Trucking and warehousing	22,408	340,963
34	Local transit	4,009	56,914
35	Air transportation	6,260	126,229

See footnotes at end of table.

Table 1—Total labor and proprietorial employment and income, by industry, Louisiana, 1980^{1/} (continued)

Industry number	Industry	Employees	Total income
			<i>Thousand 1977 dollars^{2/}</i>
Wage and salary			
36	Pipeline transportation	1,122	24,405
37	Transportation services	3,531	63,066
38	Water transportation	39,152	640,916
39	Communications	22,816	424,463
40	Electric, gas, and sanitation services	17,480	337,409
41	Wholesale trade	102,798	1,547,219
42	Retail trade	256,502	2,096,629
43	Banking	24,210	277,929
44	Other credit agencies	13,987	196,474
45	Insurance	24,112	378,212
46	Real estate and combinations	12,268	144,921
47	Hotel and other lodging	20,743	147,911
48	Personal, miscellaneous business, and repair services	74,247	859,739
49	Auto repair service	8,576	114,570
50	Amusement	9,183	61,676
51	Motion pictures	2,111	10,978
52	Private households	60,532	145,516
53	Medical and other health	74,247	987,768
54	Private education	19,581	152,456
55	Nonprofit organizations	35,397	225,355
56	Miscellaneous services	24,399	639,442
57	Federal civilian	35,202	521,434
58	Federal military	44,189	293,624
59	State and local government	265,522	2,474,124
Proprietorial			
60	Farm proprietors	46,254	243,939
61	Nonfarm proprietors	<u>106,608</u>	<u>1,398,728</u>
	Total	1,853,985	23,197,911

^{1/}Source of data for this table for Louisiana, 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, above) from the lumber and wood products (no. 18) industry. Wood furniture (no. 20) was similarly separated from other furniture and fixtures (no. 21).

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

^{3/}Included with fabricated metals and other related industries.

Table 2—Calculation of 1980 dependency indexes for Louisiana
(In percent)

Industry	Employment		Louisiana excess employment ^{1/}	Dependency index ^{2/}
	Louisiana	United States		
Agriculture	1.40	1.46	—	—
Agricultural services, forestry, and fisheries	.45	.62	—	—
Farm proprietors	3.04	3.03	0.01	0.09
Coal mining	0	.27	—	—
Oil and gas extraction	5.58	.60	4.97	30.42
Metal mining	0	.11	—	—
Nonmetallic minerals	.26	.14	.12	.76
Construction	9.04	4.74	4.29	26.26
Food and kindred products	1.74	1.87	—	—
Tobacco	0	.07	—	—
Textile mill production	.14	.93	—	—
Apparel and other textiles	.72	1.39	—	—
Paper and allied products	.83	.76	.08	.47
Printing and publishing	.60	1.37	—	—
Chemical and allied products	2.14	1.22	.92	5.65
Petroleum refining	.86	.22	.64	3.89
Rubber and miscellaneous plastics	.13	.80	—	—
Leather and leather products	.01	.26	—	—
Lumber and wood products, except mobile homes	.96	.71	.25	1.53
Mobile homes	.04	.05	—	—
Wood furniture	.04	.32	—	—
Other furniture and fixtures	.02	.19	—	—
Stone, clay, and glass products	.56	.73	—	—
Primary metals	.50	1.26	—	—
Fabricated metals	1.11	1.77	—	—
Machinery, excluding electrical	.82	2.73	—	—
Electrical machinery	.70	2.31	—	—
Transportation equipment, except motor vehicles	1.80	1.21	.59	3.60
Motor vehicles	.05	.87	—	—
Instruments and related equipment	.07	.77	—	—
Miscellaneous manufacturing	.09	.47	—	—
Railroad transportation	.53	.58	—	—
Trucking and warehousing	1.47	1.40	.07	.40
Local transit	.26	.29	—	—
Air transportation	.41	.50	—	—
Pipeline transportation	.07	.02	.05	.31
Transportation services	.23	.22	.01	.05
Water transportation	2.56	.23	2.33	14.27
Communications	1.49	1.48	.01	.07
Electrical, gas, and sanitation services	1.14	.90	.24	1.47
Wholesale trade	6.73	5.79	.94	5.75
Retail trade	16.78	16.50	.28	1.74
Banking	1.58	1.72	—	—

See footnotes at end of table.

Table 2—Calculation of 1980 dependency indexes for Louisiana (continued)
(In percent)

Industry	Employment		Louisiana excess employment ^{1/}	Dependency index ^{2/}
	Louisiana	United States		
Other credit agencies	.92	.99	—	—
Insurance	1.58	1.89	—	—
Real estate and combinations	.80	1.16	—	—
Hotel and other lodging	1.36	1.20	.16	.96
Personal, miscellaneous business, and repair services	4.86	4.69	.16	1.01
Auto repair service	.56	.63	—	—
Amusement	.60	.84	—	—
Motion pictures	.14	.24	—	—
Medical and other health	4.86	5.71	—	—
Private education	1.28	1.47	—	—
Nonprofit organizations	2.32	3.01	—	—
Miscellaneous services	1.60	1.63	—	—
Federal civilian	2.30	3.27	—	—
Federal military	2.89	2.68	.21	1.29
Nonfarm proprietors	6.98	7.66	—	—
Total^{3/}	100.00	100.00	16.35	100.00

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

^{2/}Individual industry excess employment expressed as a percentage of Louisiana'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/}
Louisiana 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	317.4	132.8	24.5	7.53	12.73
Wood furniture	12.3	5.4	1.1	6.27	-1.82
Paper and allied products	692.9	245.8	25.0	17.88	9.00

^{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 Manufactures, for 1972 and 1977, Louisiana and the United States, available in 1976 and 1980, respectively. In the few instances where data were not available for some subindustry segments, the distribution of the number of establishments was used to estimate nondisclosures.

**Appendix 2,
Louisiana Parishes**

Code	Parish	Code	Parish
1	Acadia	33	Madison
2	Allen	34	Morehouse
3	Ascension	35	Natchitoches
4	Assumption	36	Orleans
5	Avoyelles	37	Ouachita
6	Beauregard	38	Plaquemines
7	Bienville	39	Pointe Coupee
8	Bossier	40	Rapides
9	Caddo	41	Red River
10	Calcasieu	42	Richland
11	Caldwell	43	Sabine
12	Cameron	44	St. Bernard
13	Catahoula	45	St. Charles
14	Claiborne	46	St. Helena
15	Concordia	47	St. James
16	De Soto	48	St. John the Baptist
17	East Baton Rouge	49	St. Landry
18	East Carroll	50	St. Martin
19	East Feliciana	51	St. Mary
20	Evangeline	52	St. Tammany
21	Franklin	53	Tangipahoa
22	Grant	54	Tensas
23	Iberia	55	Terrebonne
24	Iberville	56	Union
25	Jackson	57	Vermilion
26	Jefferson	58	Vernon
27	Jefferson Davis	59	Washington
28	Lafayette	60	Webster
29	Lafourche	61	West Baton Rouge
30	La Salle	62	West Carroll
31	Lincoln	63	West Feliciana
32	Livingston	64	Winn

Maki, Wilbur R.; Schallau, Con H; Foster, Bennett B.; Redmond, Clair H. Louisiana's forest products industry: performance and contribution to the State's economy, 1970 to 1980. Res. Pap. PNW-RP-371. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station; 1986. 22 p.

Employment in Louisiana's forest products industry, unlike employment in the other 12 Southern States, decreased significantly between 1970 and 1980. Despite this decrease, the value added by the industry increased. The productivity of Louisiana's forest products industry ranked second among the 13 States in the South. In 1980, lumber and wood products accounted for the largest share of the industry's employment, but paper and allied products had a larger share of the earnings. In 1977, paper and allied products had higher productivity than either lumber and wood products or wood furniture.

Keywords: Forest products industries, employment (forest products industries), Louisiana.

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