

INDUSTRIAL RESOURCES AND

POTENTIALS OF THE

SOUTHEAST RIVER BASINS

by

LAMAR WHITE

and others

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## CONTENTS

Industrial Resources and Potentials of the Southeast River Basins.

H. Economic Indicators for Major Functional Segments of the Economy.  
August 1960.

I. Summary of Recent Trends in Economic Growth and Development. July  
1960.

J. Fulmer, John L.  
Economic - Statistical Projections. August 1960.

K. Mathematical - Economic Projections. August 1960.

L. Economic Development Potentials by River Basin. July 1960.



INDUSTRIAL RESOURCES AND POTENTIALS  
OF THE SOUTHEAST RIVER BASINS

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Economic Indicators  
for  
Major Functional Segments of the Economy

Prepared for the administrative use only of the  
United States Study Commission, Southeast River Basins

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Lamar White, Project Director

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Industrial Development Branch  
Engineering Experiment Station  
Georgia Institute of Technology  
August 1960

# INDUSTRIAL RESOURCES AND POTENTIALS OF THE SOUTHEAST RIVER BASINS

## Sections of the Final Report and Their Designations

<u>Title</u>	<u>Section</u>
Land Use Patterns and Planning Activity	A
Mineral Resources Review	B
Water Resources	C
Population and Labor Force	D
Employment	E
Personal Income	F
Disposable Income, Consumption, and Savings	G
Economic Indicators for Major Functional Segments of the Economy	H
Summary of Recent Trends in Economic Growth and Development	I
Economic-Statistical Projections	J
Mathematical-Economic Projections	K
Economic Development Potentials by River Basin	L

. Contributors of statistical analyses and other elements of this section include Vivian G. Conklin, Charles L. Dickson, Lee A. Dudley, Hilda Hardy, Walter Kennon, Roger Sund, and Lamar White. Many of the calculations and tabulations were made by Marilyn Feinberg. The principal sub-section, manufacturing, was prepared by Vivian G. Conklin.

## Table of Contents

### ECONOMIC INDICATORS FOR MAJOR FUNCTIONAL SEGMENTS OF THE ECONOMY

	<u>Page</u>
Manufacturing	1
Summary of Trends and Outlook	1
Data for 1940 and 1950	1
Manufacturing Activity by Location of Establishment	2
Employment by Industry	11
Geographic Concentration of Leading Industries	14
Distribution of Employment by State Segments	18
Distribution in Urban Areas	18
Trade and Services	20
Trade	20
Wholesale Trade	20
Retail Trade	22
Selected Services	24
Transportation and Public Utilities	69
Railroads	69
Highway Transportation	70
Pipeline Transportation--Liquid Products	72
Water Transportation	72
Air Transportation	75
Communications	75
Electric Utilities	77
Gas Utilities	78
Construction	111
Employment	111
Personal Income from Construction	113
Output Measures	114

## Manufacturing

### Summary of Trends and Outlook

Manufacturing activity in the Southeast River Basins area has maintained a steady growth in the past two decades. Employment has increased, payrolls are larger, and investment in new plant and equipment is substantial each year. Diversification in manufacturing has caused a considerable rise in the value added by manufacture.

Future prospects for employment in manufacturing in the Southeast River Basins area appear to be very good. A rapidly expanding population in the South, particularly in Florida, is providing an ever-increasing market for goods. The Southeast River Basins area is strategically located to serve as the center of manufacturing activity for this expanding market. A plentiful supply of labor, from those persons displaced by technological advances and from those persons entering the labor force for the first time, is an additional asset.

Manufacturing employment grew at an annual rate of 3.6 per cent from 1940 to 1950. In view of the expected future growth in population and consumption, it seems reasonable to use this rate of growth in projecting future employment. Applying this percentage, manufacturing employment can be expected to be 646,400 by 1975 and 952,600 by 2000 in the Southeast River Basins area.

Alternatively, if it is assumed that the proportion of manufacturing employment to total employment in the area will continue to grow until it reaches the present national average of 27 per cent and then remains relatively stable, manufacturing employment will be 645,000 in 1975 and 1,049,000 in 2000.

### Data for 1940 and 1950

In 1940, manufacturing employed 17.1 per cent of the total persons employed in the Southeast River Basins area. Table 1 shows that this percentage is slightly less than the four-state area (Alabama, Florida, Georgia, and South Carolina), and considerably below the average for the nation and other selected areas. By 1950, the portion employed in manufacturing had increased to 21.6 per cent (employing more people than any other economic sector) which was slightly more than the four-state area but still far below the other selected areas. During this period manufacturing employment grew at an annual rate of 3.6 per cent.

Table 1

PER CENT OF MANUFACTURING  
EMPLOYMENT TO TOTAL EMPLOYMENT  
IN SELECTED AREAS

	<u>1940</u>	<u>1950</u>
Southeast River Basins Area	17.1	21.6
Four-State Area	17.7	20.5
South Atlantic States	20.5	21.7
East North Central States	31.6	35.2
Middle Atlantic States	30.7	33.0
New England States	38.2	38.5
United States	23.4	25.9

Source: U. S. Census of Population, 1940 and 1950

Table 2  
FEMALE EMPLOYMENT

	Per Cent of Female Employment to Total Employment		Per Cent of Female Manufacturing Employ- ment to Total Manu- facturing Employment	
	<u>1940</u>	<u>1950</u>	<u>1940</u>	<u>1950</u>
Southeast River Basins Area	26.7	29.9	25.8	26.8
Four-State Area	27.2	32.3	23.0	25.9
South Atlantic States	26.3	29.4	24.8	27.4
East North Central States	24.5	27.1	17.4	20.9
Middle Atlantic States	27.8	29.9	26.4	29.7
New England States	30.3	32.2	28.7	31.8
United States	24.8	28.0	22.0	25.0

Source: U. S. Census of Population, 1940 and 1950

The percentage distribution of females employed and females employed in manufacturing (Table 2) indicates that the female employment represents a larger share of total employment and that there are relatively more females employed in manufacturing in the Southeast River Basins area than in the nation. However, some of the more highly industrialized and urbanized regions of the country reflect a larger percentage of female employment.

The high percentage of female employment in manufacturing in the study area is attributable to the concentration of textile and apparel establishments in the area. Female employment in these two industries in 1950 in the Southeast River Basins area represented approximately 80 per cent of the total female employment in manufacturing. The national average for these two industries is 35 per cent of total female employment. However, it should be noted that the other selected areas reflect a greater gain in the portion of female manufacturing employment than does the study area.

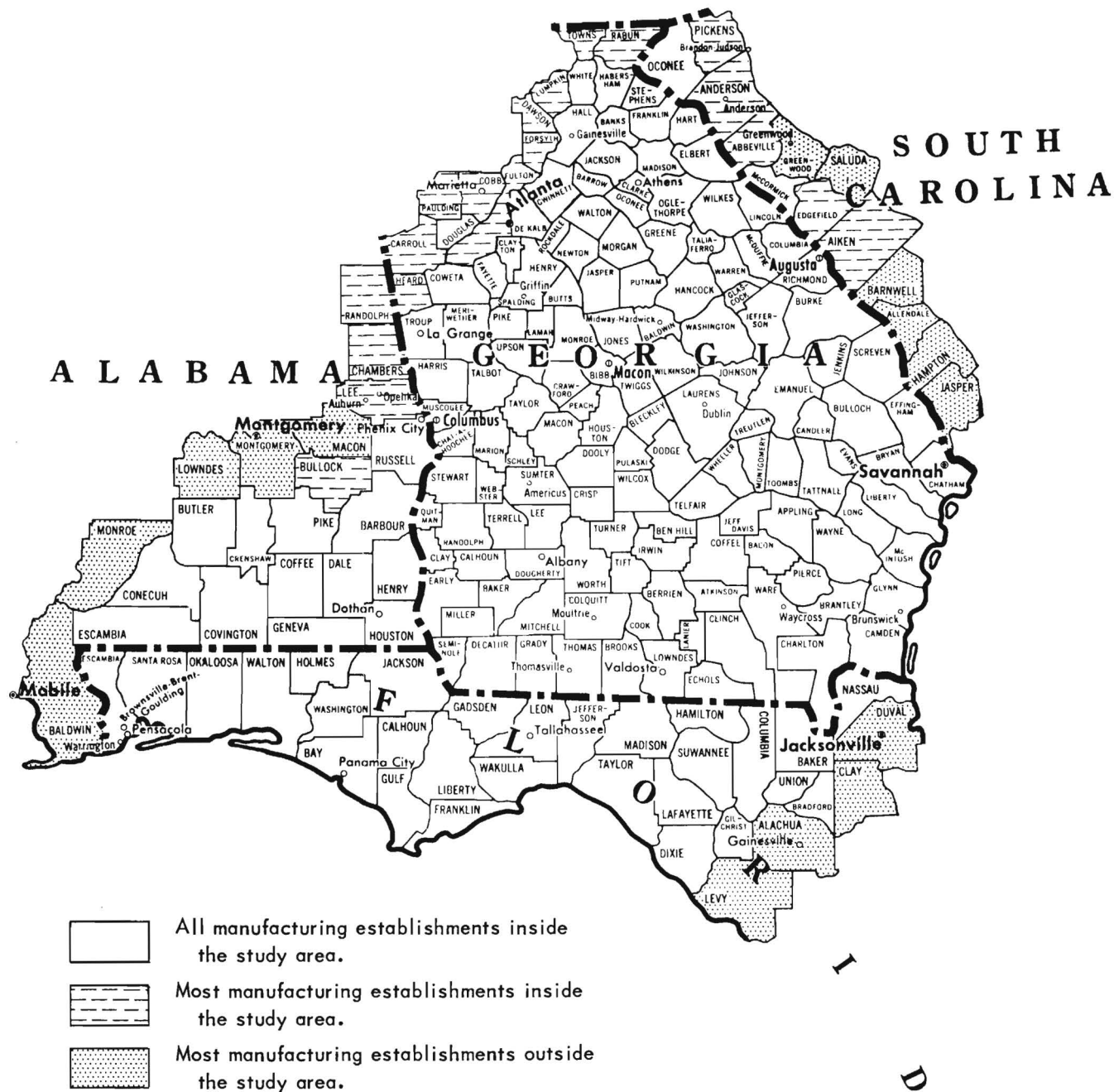
#### Manufacturing Activity by Location of Establishment

In the previous paragraphs, the data used were derived from the 1940 and 1950 Census of Population reports. The employment reported is based on place of residence and represents all counties and portions of counties included in the study area. The data used in the following paragraphs are derived from the Census of Manufactures--1939, 1947, 1954, and 1958--and the individual state employment security agencies, which report employment by place of establishment. In view of the difficulties and uncertainties involved in attempting to apportion the data accurately for those border counties which are only partially included in the area, the analysis is limited to a 195-county area in which all or most of the manufacturing establishments in each county are within the Southeast River Basins area. Map 1 shows the location of these counties--143 in Georgia, 28 in Florida, 17 in Alabama and seven in South Carolina.

The Census of Manufactures furnishes data on several measures of manufacturing activity--number of establishments, number of employees, wages and salaries of employees, value added by manufacture, and expenditures for new plant and equipment. These are useful in evaluating the importance of manufacturing activity to an area. In the 195-county area, considerable gains have been realized according to each of these yardsticks.



MAP I  
COUNTIES INCLUDED IN DISCUSSION OF  
MANUFACTURING ACTIVITY



The number of establishments in the 195-county area has increased 82.9 per cent from 1939 to 1954 (Table 3). This increase compares favorably with that of the South Atlantic States, but is less than the gain in the four-state region. However, it is considerably more than the average for the other selected areas. An analysis of the 1954 Census shows that of the 6,925 establishments reported, 9.8 per cent (679) employed 100 or more people, 18.2 per cent (1,264) employed from 20 to 99 people, and the remaining 72.0 per cent (4,982) employed less than 20 persons each. Of these 6,925 establishments, 3,186 or 46.0 per cent are engaged in the lumber and products (except furniture) industry. Of these 3,186, only 60 (less than 2 per cent) employ 100 persons or more, and 402 or 12.6 per cent employ from 20 to 99 persons. The remaining 2,724 establishments (85.5 per cent) employ less than 20 persons. Excluding this industry with its many small establishments, the 195-county area contains 3,739 establishments, 16.6 per cent employing 100 or more persons, 23.0 per cent employing 20 to 99 persons, and 60.4 per cent employing less than 20 persons each.

During this same period, from 1939 to 1954, the number of employees has increased from 201,380 in the 195-county area to 366,295, or 81.8 per cent. (See Table 4.) This increase is considerably above that for the other areas selected, thus indicating that manufacturing employment is growing at a faster rate in the 195-county area than in the other selected areas.

Manufacturing payrolls for all employees have increased fivefold in a 15-year period. Table 5 shows that the increase of 576.8 per cent exceeds all the other selected areas. The value added by manufacture has also increased more than fivefold during this period. (See Table 6.) The per cent of increase in the 195-county area is more than in the four-state region and considerably more than in the other selected areas. However, it should be noted that the 195-county area's percentage of the United States total in manufacturing payrolls and in value added by manufacture is slightly below its share of the number of manufacturing establishments and of the number of manufacturing employees. In 1954 the 195-county area contained 2.4 per cent of the number of manufacturing establishments in the United States and 2.3 per cent of the number of manufacturing employees, but accounted for only 1.7 per cent of the total manufacturing payrolls and 1.7 per cent of value added by manufacture. This indicates that the industries located in the 195-county area are principally those included in the low-wage, low-value-added category.

Table 3

NUMBER OF MANUFACTURING ESTABLISHMENTS  
IN SELECTED AREAS

	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>% of Increase 1939-54</u>
195-County Area	3,785	5,436	6,925	82.9
Per Cent of U. S.	2.2%	2.3%	2.4%	
Four-State Region	8,313	13,033	17,060	105.2
Per Cent of U. S.	4.8%	5.4%	5.9%	
South Atlantic States	16,657	24,000	30,530	83.3
Per Cent of U. S.	9.6%	10.0%	10.6%	
East North Central States	38,013	50,569	58,946	55.1
Per Cent of U. S.	21.9%	21.0%	20.6%	
Middle Atlantic States	52,226	75,341	82,380	57.7
Per Cent of U. S.	30.0%	31.3%	28.7%	
New England States	15,201	20,256	24,625	62.0
Per Cent of U. S.	8.7%	8.4%	8.6%	
United States	173,802	240,807	286,817	65.0

Source: U. S. Census of Manufactures--1939, 1947, and 1954

Table 4  
MANUFACTURING EMPLOYMENT--ALL EMPLOYEES  
IN SELECTED AREAS  
(In Thousands)

	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>% of Increase 1939-54</u>
195-County Area	201.4	288.5	366.3	81.8
Per Cent of U. S.	2.1%	2.0%	2.3%	
Four-State Region	504.9	723.6	861.2	70.6
Per Cent of U. S.	5.3%	5.1%	5.5%	
South Atlantic States	1,110.7	1,523.9	1,745.4	57.1
Per Cent of U. S.	11.7%	10.7%	11.2%	
East North Central States	2,692.8	4,322.8	4,459.8	65.6
Per Cent of U. S.	28.3%	30.2%	28.5%	
Middle Atlantic States	2,757.9	3,953.9	4,105.2	48.9
Per Cent of U. S.	28.9%	27.7%	26.2%	
New England States	1,121.2	1,475.2	1,431.3	27.7
Per Cent of U. S.	11.8%	10.3%	9.1%	
United States	9,527.3	14,293.9	15,651.9	64.3

Source: U. S. Census of Manufactures--1939, 1947, and 1954

Table 5  
MANUFACTURING WAGES AND SALARIES  
IN SELECTED AREAS  
(In Millions of Dollars)

	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>% of Increase 1939-54</u>
195-County Area	155.2	548.1	1,050.2	576.8
Per Cent of U. S.	1.2%	1.5%	1.7%	
Four-State Region	415.3	1,475.1	2,533.7	510.1
Per Cent of U. S.	3.3%	3.7%	4.0%	
South Atlantic States	1,073.7	3,371.4	5,480.9	410.5
Per Cent of U. S.	8.5%	8.5%	8.7%	
East North Central States	4,092.1	13,019.2	20,003.6	388.8
Per Cent of U. S.	32.2%	32.8%	31.8%	
Middle Atlantic States	3,859.9	11,419.7	16,656.2	331.5
Per Cent of U. S.	30.4%	28.8%	26.4%	
New England States	1,402.1	3,940.1	5,356.1	282.0
Per Cent of U. S.	11.0%	9.9%	8.5%	
United States	12,706.1	39,695.6	62,993.3	395.8

Source: U. S. Census of Manufactures--1939, 1947, and 1954

Table 6

## VALUE ADDED BY MANUFACTURE IN SELECTED AREAS

(In Millions of Dollars)

	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>% of Increase 1939-54</u>
195-County Area	312.1	1,187.3	1,940.2	521.7
Per Cent of U. S.	1.3%	1.6%	1.7%	
Four-State Region	810.8	3,037.4	4,750.3	485.9
Per Cent of U. S.	3.3%	4.1%	4.1%	
South Atlantic States	2,217.0	6,941.9	10,657.7	380.7
Per Cent of U. S.	9.1%	9.3%	9.1%	
East North Central States	7,744.4	23,474.2	36,500.5	371.3
Per Cent of U. S.	31.6%	31.6%	31.2%	
Middle Atlantic States	7,308.8	20,768.0	30,402.2	316.0
Per Cent of U. S.	29.8%	28.0%	26.0%	
New England States	2,414.3	6,798.1	9,128.3	278.1
Per Cent of U. S.	9.9%	9.2%	7.8%	
United States	24,487.3	74,290.5	116,912.5	377.4

Source: U. S. Census of Manufactures--1939, 1947, and 1954

The Census of 1954 included for the first time information by county on expenditures for new plant and equipment. On a state and regional basis, the data were given for the year 1947 as well as 1954 (Table 7). The county data for 1954 indicate that the 195-county area for this one year may be lagging behind the rest of the four-state region. In the other categories discussed above, the 195-county area represents approximately 40 per cent of the four-state region, but in expenditures for new plant and equipment the 195-county area represents only about 35 per cent of the four-state region. A comparison of the data on the four-state region for 1947 and 1954 reveals that the region's expenditures for new plant and equipment represents a slightly higher share of the total national expenditure in 1954 than in 1947. Estimates in the Annual Survey of Manufactures for 1955, 1956, and 1957, and the preliminary release of the 1958 Census of Manufactures, indicate that 5.5 to 5.6 per cent of the nation's total expenditures for new plant and equipment have been in the four-state region. The region has thus maintained a relatively constant share of the nation's expenditures for new plant and equipment.

Employment by Industry. The percentage distribution of manufacturing employment by two-digit S.I.C. industries is reported in Table 8 for the years 1939, 1947, 1954, and 1958. In 1939 the major manufacturing employer was the textile industry, which accounted for approximately 46 per cent of total manufacturing employment as estimated from data of the individual state agencies on insured employment. Employment in textiles plus four other industries accounts for approximately 80 per cent of total manufacturing employment. These four industries are lumber and products (except furniture), 9.44 per cent; food and kindred products, 8.01 per cent; apparel and related products, 7.81 per cent; and chemicals and allied products, 7.56 per cent.

By 1958, the influx of industry had altered this pattern. The textile industry was still the major employer, actually showing an absolute numerical gain in employment; but it represented only 29.85 per cent of total manufacturing employment. The addition of many new apparel plants moved apparel and related products into second place with 12.89 per cent of total employment. Food and kindred products was still third with 11.59 per cent, while lumber and products (except furniture) dropped to fourth with 10.00 per cent of total employment. The location of auto and plane assembly plants in the area moved transportation equipment into fifth place with 7.37 per cent of total manufacturing employment. Other important sectors of manufacturing are paper and allied products, 5.43 per cent; and chemicals and allied products, 4.29 per

Table 7  
EXPENDITURES FOR NEW PLANT AND EQUIPMENT  
IN SELECTED AREAS  
(In Millions of Dollars)

	<u>1947</u>	<u>% of U. S.</u>	<u>1954</u>	<u>% of U. S.</u>
195-County Area	(1)	---	144.0	1.8
Four-State Region	268.5	4.5	409.4	5.2
South Atlantic States	677.7	11.3	789.3	10.0
East North Central States	1,863.5	31.1	2,653.9	33.9
Middle Atlantic States	1,335.2	22.3	1,551.1	19.8
New England States	418.6	7.0	424.3	5.4
United States	5,998.1	---	7,818.2	---

(1) Not available by county

Source: Census of Manufactures--1947 and 1954



Table 8

PERCENTAGE DISTRIBUTION OF MANUFACTURING EMPLOYMENT  
IN SOUTHEAST RIVER BASINS AREA,  
BY TWO-DIGIT S.I.C. INDUSTRY  
FOR SELECTED YEARS

	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>1958</u>
Food and kindred products	8.01	8.36	9.46	11.59
Textile mill products	45.87	39.38	34.16	29.85
Apparel products	7.81	7.46	11.30	12.89
Lumber and wood products, except furniture	9.44	21.83	14.03	10.00
Furniture and fixtures	3.81	1.95	2.15	2.13
Paper and allied products	2.30	3.00	5.19	5.43
Printing, publishing and allied industries	2.19	1.89	2.24	2.67
Chemicals and allied products	7.56	4.24	4.29	4.29
Leather and leather products	2.29	.76	.72	1.05
Stone, clay and glass products	2.91	1.83	2.17	2.71
Primary metal products	1.87	1.53	1.22	1.14
Fabricated metal products	----	.95	1.56	1.60
Machinery, except electrical	.17	1.85	1.67	2.03
Electrical machinery, equipment and supplies	.25	.45	.37	.89
Transportation equipment	1.39	1.57	7.08	7.37
Other manufacturing	4.13	2.95	2.39	4.36
Durables	23.3	34.7	32.3	31.8
Nondurables	76.7	65.3	67.7	68.2

Source: Industrial Development Branch estimates for 195-County area, derived from covered employment as reported by the individual state employment security agencies.

cent. These seven industries account for approximately 81 per cent of total manufacturing employment. This represents a considerable broadening of the manufacturing base in the study area. With the continued influx of industry to serve a rapidly expanding market, the area can look forward to a further broadening of its base and a sound, diversified economy.

Growth from 1939 to 1954. Table 9 shows the changes in number of establishments in the 195-county area by two-digit S.I.C. industry. There is a significant drop in the number of establishments in only one industry, chemicals and allied products, which is attributable to the loss of naval stores establishments. Many of the other industries show substantial gains in the number of establishments. The largest gain in number of establishments is registered by the lumber and wood products (except furniture) industry.

The growth in manufacturing employment from 1939 to 1954 by industry is recorded in Table 10. Substantial gains in employment were realized in all but four of the industries reported. The largest decrease in employment occurred in the leather industry. This decrease follows the national trend in the leather industry. The growth in employment in durable goods was considerably above the growth in nondurable goods. The Southeast River Basins area has historically been primarily a producer of nondurable goods, and this increase in employment in durable goods indicates a change to a more diversified economy.

Geographic Concentration of Leading Industries. Four of the seven industries which account for more than 80 per cent of total manufacturing employment are characterized by their concentration in a few counties in the area. In the 195-county area, 60 per cent of the textile industry employment is centered in 10 counties. In the chemical industry 95 per cent of the employment is located in seven counties. Ninety-six per cent of the employment in the paper industry is located in nine counties. The fourth industry, transportation equipment, is the most centralized of all the industries with 98 per cent of employment located in three adjoining counties in Georgia. (Map 2 locates these counties.)

The other three major industries are more widely scattered. The food industry is more centralized than the other two, with most employment located in the larger cities and metropolitan areas. The apparel industry and the wood and wood products (except furniture) industry are dispersed throughout the area. Most of the wood industry is located in the Georgia section of the Southeast River Basins area south of the Fall Line and in the Florida counties. In many

MAP II  
1954 CONCENTRATION OF EMPLOYMENT IN SELECTED INDUSTRIES  
SOUTHEAST RIVER BASINS AREA



Table 9

## NUMBER OF ESTABLISHMENTS IN 195-COUNTY AREA--1939 AND 1954

(By Two-Digit S.I.C.)

	<u>1939</u>	<u>1954</u>
Food and kindred products	803	1012
Textile mill products	246	320
Apparel	108	310
Lumber and wood products, except furniture	868	3186
Furniture and fixtures	142	210
Paper and allied products	34	85
Printing, publishing and allied industries	336	519
Chemicals and allied products	886	321
Leather and leather products	19	26
Stone, clay and glass products	109	285
Primary metal industries	44	42
Fabricated metal products	24	153
Machinery, except electrical	88	196
Electrical machinery, equipment and supplies	8	30
Transportation equipment	21	55
Miscellaneous manufacturing industries	<u>49</u>	<u>175</u>
Total number of manufacturing establishments	3785	6925
Less: Lumber and wood products	- <u>868</u>	- <u>3186</u>
Total, excluding lumber and wood products	2917	3739

Source: Census of Manufactures--1939 and 1954

Table 10

MANUFACTURING EMPLOYMENT BY TWO-DIGIT S.I.C. INDUSTRY  
IN 195-COUNTY AREA

	<u>1939</u>	<u>1954</u>	<u>Per Cent Change</u>
Food and kindred products	16,542	32,846	98.6
Textile mill products	94,701	118,540	25.2
Apparel products	16,116	39,220	143.4
Lumber and wood products, except furniture	19,490	48,687	149.8
Furniture and fixtures	7,867	7,463	- 5.1
Paper and allied products	4,760	18,019	278.6
Printing, publishing and allied industries	4,520	7,769	71.9
Chemicals and allied products	15,604	14,882	- 4.6
Leather and leather products	4,728	2,493	- 47.3
Stone, clay and glass products	6,002	7,551	25.8
Primary metal industries	3,859	4,222	9.4
Fabricated metal products	---	5,401	---
Machinery, except electrical	354	5,814	1542.4
Electrical machinery, equipment and supplies	521	1,296	148.8
Transportation equipment	2,870	24,570	756.1
Other miscellaneous manufacturing industries	8,518	7,930	- 6.9
<u>Total Manufacturing Employment</u>	<u>206,451</u>	<u>347,057</u>	<u>68.1</u>
Durables	48,074	112,223	133.4
Nondurables	158,377	234,834	48.3

Source: Industrial Development Branch estimates for 195-County area derived from covered employment as reported by the individual state employment security agencies.

of the small rural counties the lumber and wood products industry (except furniture) represents the major manufacturing employer.

Distribution of Employment by State Segments. The percentage distribution of manufacturing employment in the four state segments included in the Southeast River Basins study area has changed very little from 1939 to 1958 according to data compiled from the various state agencies. (See Table 11.) Approximately three-fourths of the manufacturing employment is contained in the Georgia segment. The Florida segment has shown the greatest change, gaining from 3.7 per cent of total 1939 manufacturing employment in the study area to 7.1 per cent in 1958. However, it should be noted that this segment of Florida has experienced less manufacturing growth than other areas in the State.

Table 11

PERCENTAGE DISTRIBUTION OF MANUFACTURING EMPLOYMENT  
BY STATE SEGMENTS

	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>1958</u>
Alabama	9.5	10.4	9.0	8.6
Florida	3.7	5.4	5.3	7.1
Georgia	74.7	74.1	74.9	73.6
South Carolina	12.1	10.1	10.8	10.7

Source: Industrial Development Branch estimates derived from data furnished by the individual state employment security agencies.

Distribution in Urban Areas. According to the latest definition of standard metropolitan areas, there are six such areas in the study area. These are Atlanta, Augusta, Columbus, Macon, and Savannah in Georgia, and Pensacola in Florida. These six metropolitan areas include one county in Alabama, one in Florida, one in South Carolina, and eleven counties in Georgia. These 14 counties in 1954 accounted for 43.2 per cent of the manufacturing employment in the 195-county area.

In 1954, there were 17 counties in the 195-county area containing a city of 10,000 population or more (excluding the standard metropolitan

areas). These 17 counties (two in Alabama, two in Florida, 12 in Georgia and one in South Carolina) represented 19.4 per cent of the manufacturing employment in the 195-county area.

Thus, 62.6 per cent of the manufacturing employment in the 195-county area is concentrated in these 31 counties which contain large urbanized areas.

## Trade and Services

### Trade

The study area's employment in trade (both wholesale and retail) rose from about 120,000 in 1939 to over 249,000 in 1958, according to Census of Business figures. The employment statistics from the business censuses of 1939, 1948, 1954, and 1958 are consistently higher than figures on insured employment from the state employment security agencies. Job insurance coverage would therefore appear to be relatively low in this industry division. Table 12 compares estimates from the two sources with a third set derived from statewide Bureau of Labor Statistics data.

Trade is one of the major sources of personal income in the study area states, according to data presented in Table 13. Furthermore, it has tended to increase in relative importance from 1939 to 1958. As a percentage of total wages and salaries, trade wages and salaries have been especially important in Florida since 1939. There they typically have been about 23 per cent, compared with a national average of some 18 or 19 per cent during the years examined from 1939 to 1958. Georgia shows a proportion higher than the national average since 1948. Trade wages and salaries have been relatively less important in Alabama and South Carolina.

Wholesale and retail trade payrolls in the study area represented about a third of the combined totals for the four principal states in 1958. In prior Census of Business years, the study area accounted for 36 or 37 per cent of the total. The approximate percentages in the individual intrastate segments (ratio of segment to respective state total) have been 9 in Alabama, 7 or 8 in Florida, 8 or 9 in South Carolina, and 95 to 96 in Georgia.

A comparison of estimates in Table 15 with the data in Table 13 shows that trade wages and salaries relative to total wages and salaries are much less important in the study area portions of Alabama, Florida, and South Carolina than in those whole states; the reverse is true in Georgia.

Wholesale Trade. Among the four principal states under study, Florida has advanced to leadership in number of establishments. Georgia leads in total sales volume according to the latest (1958) Census of Business, and has increased its share of the national total from 1.46 per cent in 1939 to 2.02 per cent in 1958. Each of the other three states also increased its share during the same period, although South Carolina's rise was slight.



Examination of the main types of wholesale operations shows that Georgia's strength is greatest in manufacturers' sales branches, for which its sales volume advanced from 1.83 to 2.76 per cent of the national total from 1939 to 1958. Its overall position in most years observed has also been boosted by its share of petroleum bulk plants, terminals, and liquified petroleum gas facilities--2.05 per cent of the national total in 1958. Florida's position in this category is even higher--3.29 per cent in 1958, up from 1.85 per cent in 1939. Florida is also outstanding in sales by merchant wholesalers,--2.21 per cent of the nationwide total in 1958--and in sales by assemblers of farm products, which represented 2.65 per cent of the U. S. total in 1958.

Analysis of sales volume by kind of business indicates that certain categories are strong in each state relative to that state's share of the country's total wholesale sales. For example, Alabama's overall percentage of the U. S. total was 1.04 in 1958, but the kinds of business listed below were substantially better than this overall average.

<u>Kind of Business</u>	<u>Per Cent of U. S. Total</u>
Hardware; plumbing and heating equipment and supplies	1.58
Metals and minerals	1.45
Petroleum bulk stations and terminals	1.60
Scrap and waste materials	1.84
Tobacco and tobacco products	1.78
Lumber and construction materials	1.99

Similarly, in Florida the strongest categories in 1958 included the above categories, except "metals and minerals" and "scrap and waste materials," plus the following: motor vehicles and automotive equipment; groceries and related products; and beer, wine, and distilled alcoholic beverages. Georgia's relatively strong ones were drugs, chemicals and allied products; motor vehicles and automotive equipment; electrical goods; and furniture and home furnishings. South Carolina's leading categories by this method of measurement were petroleum bulk stations and terminals; farm products (raw materials); tobacco and tobacco products; beer, wine, etc.; and groceries and related products. Tables 21, 22, 23, and 24 show the importance of the wholesaler type of operation by kind of business, as related to total wholesale trade, in each of the four states in 1958.

In the study area proper, the number of wholesale establishments rose from some 3,700 in 1939 to almost 6,300 in 1958. The rate of climb was most rapid in the Florida portion and slowest in the South Carolina portion. The estimated total sales volume rose from about \$877 million in 1939 to \$6.2 billion in 1958, or from 1.59 per cent of the national total to 2.22 per cent during the same period. The sales volume per establishment in 1958 was \$990,700, compared with \$1,004,000 in the country as a whole. By intrastate segments, the Georgia area heavily influenced the total with over \$1.1 million per establishment--a much higher average than in the other segments or the other whole states, and slightly higher than the State of Georgia average. Measuring output by the ratio of annual sales to annual payroll, the entire study area's ratio in 1958 was 22.3 to 1. The corresponding national ratio was 21.3. Among the intrastate portions of the study area, Alabama led with 25.8. The Georgia segment's ratio was 22.4, followed by those of South Carolina (21.6) and Florida (19.6).

Retail Trade. Sales in the study area states have advanced both in absolute terms and relative to the national totals from 1939 to 1958. Retail sales in the State of Alabama rose from 1.04 to 1.29 per cent of the national total in this period; Florida, from 1.46 to 2.92; Georgia, from 1.49 to 1.77; and South Carolina, from 0.79 to 0.87 per cent. South Carolina's percentage had been slightly higher in 1948 and 1954, however.

According to the 1958 Census of Business the leading components of total retail sales by kind of business in the country as a whole were food stores; automotive; general merchandise; and eating and drinking places. These were also the leading categories in Florida and, except for eating and drinking places, the three other states as well. Gasoline stations and "lumber, building materials, and related products" were additional leading categories in the study area states.

In the study area proper, the number of establishments rose from some 41,800 in 1939 to about 45,200 in 1948, declined to 42,300 in 1954, and leveled out to 43,700 in 1958. This trend was heavily influenced by the Georgia portion. In the Florida segment there was a steady advance from each Census of Business year to the next. In the Alabama portion, the decline from the 1948 high continued to 1954 and 1958. An entirely different pattern emerges in the South Carolina segment, where there was a decline from 1939 to 1948 and three consecutive advances since then.

Total retail sales in the study area proper increased relative to the national totals from 1939 to 1948 and 1954, then declined slightly from 2.15 per cent in 1954 to 2.13 per cent in 1958. Once more the pattern in the Florida segment is different--a sustained relative advance from 0.17 per cent in 1939 to 0.29 per cent in 1958. At the same time, the total study area declined relative to the four-state totals, from about 37 per cent in 1939 to about 31 per cent in 1958.

Estimated consumer buying power in the study area relative to that in the entire country increased from 1948 to 1958, but in the terminal year still represented only about 80 per cent of the national per capita average. Similarly, per capita retail sales in the study area represented about 81 per cent of the national average in 1958, versus 69 per cent in 1954. Details are set out in Table 35. The ranking of the four principal intrastate segments in 1958 according to consumer buying power and retail sales per capita, expressed in percentages of the respective national averages, were as follows:

<u>Intrastate Segment</u>	<u>Per Cent of U. S. Per Capita Levels</u>	
	<u>Buying Power</u>	<u>Retail Sales</u>
Alabama	66	57
Florida	76	86
Georgia	83	85
South Carolina	71	64

Table 36 brings out the relative importance of urban places (cities of 2,500 or more people) in the study area's retail trade in 1954 and 1958. One notable feature is that the urban areas' proportion of total retail payrolls is larger than their proportion of sales; for the entire study area the percentages were 85.7 and 79.0 per cent respectively in 1958. Among the intrastate segments, the proportions were highest in Georgia for both payrolls and sales (88 and 81 per cent, respectively). Another significant and surprising feature is that the urban proportions of both payrolls and sales declined from 1954 to 1958. Furthermore, this trend was evident in every intrastate segment for payrolls and in all except the Florida segment for retail sales volume.

Retail trade output measures are presented in Table 37. For the entire study area, the sales volume per establishment was \$97,400 in 1958, when the ratio of annual sales to annual payroll was 10.1. The latter was higher than the national ratio of 9.2 for the same year, but the national average sales volume of \$111,700 per establishment was higher than the study area total and all study area segments. Most of the states were also sub-average in this respect; the State of Florida's average of \$117,900 was the exception. Interestingly, the Alabama and South Carolina segments had ratios of sales to payroll that were higher than that for the entire study area, and higher than the respective state ratios.

#### Selected Services

Table 38 reveals the remarkable growth in number of selected services establishments in Florida from 1939 to 1958. Those in Georgia and South Carolina increased at about the national rate; Alabama's growth lagged behind the national average; and Florida's establishments almost quadrupled in number during the period. By kind of business, the leading component was personal services--nationally and in each of the four states examined. As might be expected, Florida's hotels, motels, and tourist courts have also been of major importance throughout the period. By 1958, Florida led the other three states in numbers of establishments in all of the detailed categories, save funeral services and crematories. As to this, the reader is left to make his own interpretation.

Receipts in each of the four whole states increased absolutely and relative to the national totals from 1939 to 1958. However, Alabama's percentage of the national total has declined since 1948, as has Georgia's, while South Carolina's share since 1948 has not surpassed that year's level.

The distribution of total receipts by kind of business differs in the four states from that in the United States as a whole. The leading component nationwide is "miscellaneous business services" (over 30 per cent of the total in 1958), with personal services second. But in three of the study area states, the personal services category occupies the top spot; in Florida it is second to "hotels, motels, tourist courts, and camps." The 1958 Census of Business also shows that the auto repair and services category is second in Alabama and South Carolina and third in Georgia, but only fourth in the country as a whole and in Florida.

Examination of the detailed categories of selected service trades shows that certain ones are substantially higher in some states as a percentage of national totals than those states' respective shares of total selected services receipts. Examples for 1958 include motels and tourist courts (all four states); hotels (Florida); power laundries and self-service laundries (four states); barber shops (all except Florida); shoe repair and hat cleaning establishments (Alabama and South Carolina); auto repair shops (all except Florida); auto and truck rentals (Florida); electrical repair shops (Alabama); radio and TV repair (Alabama); and miscellaneous amusement and recreation services (Florida).

In the study area proper, the number of establishments increased steadily from 1939 to 1958. Analysis by intrastate segments shows that the Florida and Georgia portions followed this trend, but the other two had sharp declines from 1939 to 1948 before advancing again. Total receipts in 1958 represented 1.57 per cent of the national total in the entire study area, compared with 1.30 per cent in 1939. But total receipts in the study area did not increase as rapidly as in the four whole states; thus the study area total represented a lower percentage of the four-state composite in 1958 than in 1939.

The service trades declined relatively as a source of personal income, both in the country and in the four states, from 1939 to 1958. This decline was more marked in each of the states than in the nation. Services have been relatively more important as a source of personal income in Florida than in the nation in all years observed, but by 1958 the differential was less than in 1939. Georgia's "index" in this respect (U. S. proportion = 100 in each year) fell from 111 in 1939 to 91 in 1958.

Payrolls in the study area rose from about \$18 million in 1939 to over \$139 million in 1958. These represented about 32 per cent of the four-state totals in 1939, and the percentage declined to about 28 per cent by 1958. However, they accounted for an increasing percentage of total wages and salaries in the study area itself--about 6 per cent in 1939, and between 8 and 9 per cent in 1956 and 1957.

Analysis by urban and nonurban areas shows that, as in the case of wholesale and retail trade, the urban places (cities of 2,500 or more population) accounted for a higher percentage of the study area's total payrolls than of its sales. This relationship applies in each intrastate segment and in both 1954 and 1958.

Selected services receipts per establishment averaged \$25,870 in the study area in 1958, compared with \$33,200 in the nation generally. The Georgia segment's average (\$28,630) exceeded that of other segments and of each of the four states except Florida. The study area's ratio of receipts to payrolls was 3.64 in 1958, compared with an average national ratio of 3.59. The high-ratio segments were those in Alabama, Florida, and South Carolina; Georgia's ratio was sub-average. The ratios for the Alabama and South Carolina portions were well above those of the respective whole states.

Table 12

Estimates of Wholesale and Retail Trade Employment in Southeast River Basins Area, 1939, 1948, 1954, and 1958

Area and Year	Wholesale		Retail		Wholesale plus Retail		
	(a)	(b)	(a)	(b)	(a)	(b)	(c)
Southeast River Basins Area Total							
1958	65,422	35,632	183,738	182,597	249,160	218,229	xxx
1954	61,236	33,113	160,007	155,823	221,243	188,936	233,400
1948	50,796	29,457	147,489	133,530	198,285	162,987	135,100
1939	27,502	12,540	92,463	76,754	119,965	89,294	119,000
Alabama portion							
1958	3,066	1,761	12,051	8,102	15,117	9,863	11,900
1954	2,667	1,191	11,338	6,757	14,005	7,948	9,700
1948	2,285	856	10,619	5,522	12,904	6,378	7,400
1939	1,178	363	6,353	3,175	7,531	3,538	4,200
Florida portion							
1958	5,477	5,615	24,073	20,159	29,550	25,774	NA
1954	4,506	4,781	18,271	13,785	22,777	18,566	21,700
1948	2,779	3,520	14,550	10,631	17,329	14,151	10,500
1939	1,795	1,494	7,963	6,114	9,758	7,609	8,500
Georgia portion							
1958	55,688	27,200	140,094	148,439	195,782	175,639	207,000
1954	52,920	25,886	123,199	130,791	176,119	156,673	194,000
1948	45,122	24,024	115,839	114,323	160,961	138,347	161,400
1939	24,054	10,189	73,938	65,540	97,992	75,730	102,700
South Carolina portion							
1958	1,191	1,056	7,520	5,897	8,711	6,953	9,100
1954	1,143	1,254	7,199	4,495	8,342	5,749	8,000
1948	610	1,057	6,481	3,054	7,091	4,111	5,800
1939	475	493	4,209	1,924	4,684	2,417	3,600

NA = Not available.

xxx = Not applicable.

Sources: a. U.S. Dept. of Commerce, Census of Business, "paid employees, workweek ended nearest Nov. 15."  
b. State employment security agencies: Employees covered by employment security programs. Figures for years prior to 1956 are adjusted to the 1956 basis of coverage.  
c. Derived from B. L. S. data for whole states.

Table 13

Wholesale and Retail Trade as a Source of Personal Income  
in the U. S. and Selected States, 1939 - 1958

<u>Item and Year</u>	<u>U. S.</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. Carolina</u>
Wholesale and Retail Wages and Salaries (\$1,000,000)					
1958	43,060	447	1,157	726	279
Wholesale and Retail Wages and Salaries as Per Cent of Total Wages and Salaries:					
1958	17.98	15.36	22.73	18.93	13.98
1957	17.73	15.11	22.58	18.88	14.11
1956	17.66	15.64	22.79	18.83	14.32
1955	17.60	15.22	22.39	18.21	14.22
1954	17.70	15.41	22.02	18.22	13.64
1950	18.66	16.54	20.38	19.06	14.79
1948	18.71	15.47	23.90	19.76	13.93
1939	18.25	13.83	22.65	17.91	14.01
Index: U. S. Wholesale and Retail Wages and Salaries as Per Cent of U. S. Total Wages and Salaries = 100 for:					
1958	100	85.42	126.41	105.28	77.75
1954	100	87.06	124.40	102.93	77.06
1948	100	82.68	127.73	105.61	74.45
1939	100	75.78	124.10	98.13	76.76
Wholesale and Retail Payrolls (\$1,000,000)					
1958 Total	34,810	471	914	598	233
Wholesale	13,213	133	299	253	74
Retail	21,597	238	615	345	159
1954 Total	29,220	295	613	489	195
Wholesale	11,021	104	207	201	56
Retail	18,199	191	406	288	139
1948 Total	21,920	214	369	338	137
Wholesale	7,734	72	119	131	36
Retail	14,186	142	250	207	101
1939 Total	7,154	56	98	94	39
Wholesale	2,624	18	34	35	10
Retail	4,530	38	64	59	29

Sources: U. S. Bureau of the Census; and Office of Business Economics,  
U. S. Department of Commerce.



Table 14

Wholesale and Retail Trade Payrolls in Southeast River Basins Area  
for Selected Years, 1939 - 1958

Item and Year	Total Study Area	Portion in				
		Alabama	Florida	Georgia	S. Carolina	
Wholesale Trade Payrolls						
(\$1,000)	1958	279,010	8,886	19,275	246,891	3,958
	1954	218,809	6,681	12,429	196,646	3,053
	1948	153,404	4,228	6,541	141,197	1,438
	1939	36,753	966	888	34,356	543
Retail Trade Payrolls						
(\$1,000)	1958	422,497	25,040	56,957	324,326	16,174
	1954	346,581	21,032	39,291	271,621	14,637
	1948	239,524	14,197	22,491	193,300	9,536
	1939	67,774	4,025	5,908	55,154	2,687
Total, Wholesale and Retail						
Payrolls (\$1,000)	1958	701,507	33,926	76,232	571,217	20,132
	1954	565,390	27,713	51,720	468,267	17,690
	1948	392,928	18,425	29,032	334,497	10,974
	1939	104,527	4,991	6,796	89,510	3,230
Per Cent of Respective						
State Totals	1958	33.15	9.1	8.4	95.5	8.6
	1954	36.78	9.4	8.4	95.7	9.0
	1948	37.16	8.5	7.6	95.4	7.9
	1939	36.26	8.8	6.9	95.5	8.5
Estimated Per Cent of						
Respective State	1957	34.05	9.2	8.4	95.6	8.7
Totals <u>1</u> /	1956	34.96	9.3	8.4	95.6	8.8
	1950	37.03	8.8	7.9	95.5	8.3

<sup>1/</sup> Estimates derived by simple interpolation from computed percentages for 1948, 1954, and 1958.

Source: U. S. Bureau of the Census.

Table 15

Wholesale and Retail Trade as a Source of Personal Income  
in Southeast River Basins Area, Selected Years, 1939 - 1957

	Total	Portion in			
	Study Area	Alabama	Florida	Georgia	S. Carolina
Estimated Total Personal Income					
(Thousands of 1957 dollars) <sup>1/</sup>					
1957	6,756,296	496,701	914,376	5,041,600	330,200
1956	6,542,300	442,600	894,600	4,886,800	318,300
1950	4,986,100	377,300	681,100	3,662,100	265,600
1939	1,985,200	108,500	240,900	1,542,500	93,300
Estimated Total Wages and Salaries					
(Thousands of 1957 dollars) <sup>2/</sup>					
1957	4,628,100	298,774	622,126	3,478,700	228,500
1956	4,458,700	304,300	557,700	3,376,800	219,900
1950	3,097,700	233,200	393,700	2,299,800	171,000
1939	1,192,300	67,900	132,300	934,800	57,300
Estimated Wholesale and Retail Trade Wages and Salaries					
(Thousands of 1957 dollars) <sup>3/</sup>					
1957	830,900	40,000	89,200	677,800	23,900
1956	825,900	40,400	83,300	677,800	24,400
1950	561,000	28,000	46,800	468,900	17,300
1939	189,500	8,700	12,400	162,400	6,000
Per Cent of Estimated Total Wages and Salaries					
1957	18.0	13.4	14.3	19.5	10.5
1956	18.5	13.3	14.9	20.1	11.1
1950	18.1	12.0	11.9	20.4	10.1
1939	15.9	12.8	9.4	17.4	10.5

<sup>1/</sup> Estimated for 1939, 1950 and 1956 by John L. Fulmer, Georgia Institute of Technology. Estimates for 1957 made by Industrial Development Branch.

<sup>2/</sup> Derived from estimates of total personal income for the study area and its segments. The latter were estimated by John L. Fulmer for 1939, 1950 and 1956. For 1957, personal income estimates by county were used for Florida and Alabama, from studies by their respective university bureaus of business research. For Georgia and South Carolina, the 1956 ratios (study area segments to state totals) were applied to personal income statistics by state for 1957, published by the U. S. Department of Commerce.

"Total Wages and salaries" estimates for Alabama and Florida in 1956 and 1957 are from the aforementioned university studies. For the other states and years the ratio of each state's total wages and salaries to its total personal income was applied to estimated total personal income for that state's study area segment, to yield estimated total wages and salaries in the study area segment.

<sup>3/</sup> Derived by applying to statistics by state of wholesale and retail trade wages and salaries the percentage relationships developed from Census of Business payroll statistics.

Sources: U. S. Bureau of the Census;  
U. S. Department of Commerce, Office of Business Economics.

Table 16

Wholesale Trade Establishments in U. S. and  
Selected States by Type, 1939, 1948, 1954, and 1958

Type of Operation	Year	U. S.	(Number of Establishments)			
			Alabama	Florida	Georgia	S. Carolina
Wholesale Trade, Total	1958	280,091 <sup>1/</sup>	3,315	7,016	5,294	2,332
	1954	252,318	2,818	5,309	4,496	2,016
	1948	216,099	2,386	3,408	3,586	1,517
	1939	200,573	1,943	2,696	3,032	1,450
Merchant Wholesalers	1958	184,811 <sup>1/</sup>	2,171	5,019	3,168	1,503
	1954	165,153	1,814	3,699	2,658	1,256
	1948	129,117	1,397	2,098	1,835	837
	1939	101,627	888	1,385	1,231	561
Manufacturers' Sales Branches	1958	24,623 <sup>1/</sup>	301	488	707	141
	1954	22,590	264	411	671	146
	1948	23,706	258	282	619	113
	1939	18,096	161	206	398	84
Petroleum Bulk Stations, Terminals, L. P. Gas Facilities	1958	30,351 <sup>1/</sup>	463	608	646	402
	1954	29,189	423	557	568	379
	1948	28,351	426	543	568	335
	1939	30,825	443	533	540	324
Merchandise Agents and Brokers	1958	26,457 <sup>1/</sup>	286	606	606	213
	1954	22,131	245	379	482	174
	1948	18,138	168	195	360	142
	1939	20,903	172	162	374	168
Assemblers of Farm Products	1958	13,849 <sup>1/</sup>	94	295	167	73
	1954	13,255	72	263	117	61
	1948	16,787	137	290	204	90
	1939	29,122	279	410	489	313

<sup>1/</sup>Preliminary figure.

Source: U. S. Bureau of the Census.

Table 17

WHOLESALE TRADE SALES IN U. S. AND SELECTED STATES  
BY TYPE OF OPERATION, 1939, 1948, 1954, 1958

(In millions of dollars)

<u>Type of Operation</u>	<u>Year</u>	<u>U. S.</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>South Carolina</u>
Wholesale Trade- Total	1958	281,220 <sup>1/</sup>	2,928	5,467	5,682	1,564
	1954	234,974	2,327	3,402	4,548	1,341
	1948	188,689	1,678	1,991	3,264	1,008
	1939	55,266	416	526	806	297
Merchant Whole- salers	1958	119,528 <sup>1/</sup>	1,312	2,646	1,906	785
	1954	101,101	1,021	1,736	1,599	634
	1948	79,767	783	1,000	1,085	467
	1939	23,642	209	241	317	119
Manufacturers' Sales Branches, Sales Offices	1958	86,648 <sup>1/</sup>	826	1,271	2,390	171
	1954	69,534	740	646	1,834	140
	1948	52,739	447	427	1,352	112
	1939	13,526	88	92	247	27
Petroleum Bulk Plants, Terminals and LP Gas Facili- ties	1958	20,127 <sup>1/</sup>	323	662	413	305
	1954	16,038	240	422	302	231
	1948	10,616	151	260	190	126
	1939	3,808	47	71	67	41
Merchandise Agents, Brokers	1958	45,733 <sup>1/</sup>	369	645	850	268
	1954	39,251	268	392	679	293
	1948	34,610	198	176	504	230
	1939	11,201	51	42	129	73
Assemblers of Farm Products	1958	9,184 <sup>1/</sup>	98	243	124	35
	1954	9,051	58	206	134	43
	1948	10,958	99	129	135	73
	1939	3,089	21	80	45	39

<sup>1/</sup> Preliminary figure.

Source: U. S. Bureau of the Census

Table 18

Wholesale Trade Sales in Selected States, as Per Cent  
of U. S. Total, by Type of Operation, 1939, 1948, 1954, 1958

Type of Operation	Year	Per Cent of U. S. Total			
		Alabama	Florida	Georgia	South Carolina
Wholesale Trade, Total	1958	1.04	1.94	2.02	0.56
	1954	0.99	1.45	1.94	0.57
	1948	0.89	1.06	1.73	0.53
	1939	0.75	0.95	1.46	0.54
Merchant Wholesalers	1958	1.10	2.21	1.59	0.66
	1954	1.01	1.72	1.58	0.63
	1948	0.98	1.25	1.36	0.59
	1939	0.89	1.02	1.02	0.50
Manufacturers' Sales Branches	1958	0.95	1.47	2.76	0.20
	1954	1.06	0.93	2.64	0.20
	1948	0.85	0.81	2.56	0.21
	1939	0.65	0.68	1.83	0.20
Petroleum Bulk Plants, Terminals, L. P. Gas Facilities	1958	1.60	3.29	2.05	1.52
	1954	1.50	2.63	1.88	1.43
	1948	1.42	2.45	1.79	1.19
	1939	1.23	1.85	1.76	1.07
Merchandise Agents, Brokers	1958	0.81	1.41	1.86	0.59
	1954	0.68	1.00	1.73	0.61
	1948	0.57	0.51	1.45	0.66
	1939	0.45	0.38	1.16	0.65
Assemblers of Farm Products	1958	1.07	2.65	1.35	0.38
	1954	0.64	2.27	1.48	0.48
	1948	0.90	1.18	1.23	0.66
	1939	0.68	2.59	1.47	1.25

Source: U. S. Bureau of the Census.

Table 19

## Wholesale Trade Sales in Selected States, By Kind of Business, 1958

(In Millions of Dollars)				
Kind of Business	Alabama	Florida	Georgia	S. C.
Wholesale Trade, Total	2,928	5,467	5,682	1,564
Motor Vehicles, Automotive Equipment	180	580	647	69
Drugs, Chemicals, Allied Products	115	199	502	44
Dry Goods, Apparel	35	59	253	25
Groceries and Related Products	516	1,354	930	351
Farm Products-Raw Materials	276	99	398	223
Electrical Goods	145	379	425	49
Hardware; Plumbing, Heat. Equip. Supplies	125	213	161	43
Machinery, Equipment, Supplies	284	412	525	112
Metals, Minerals	320	216	287	27
Petroleum Bulk Stations, Terminals	322	662	413	305
Scrap, Waste Materials	57	23	58	16
Tobacco, Tobacco Products	98	159	119	45
Beer, Wine, Distilled Alcoholic Beverages	36	362	119	66
Paper, Paper Products, excluding Wallpaper	35	62	120	16
Furniture, Home Furnishings	26	75	112	11
Lumber, Construction Materials	211	288	207	57
Other Miscellaneous Products	148	325	407	105
Per Cent of U. S. Total:				
Wholesale Trade, Total	1.04	1.94	2.02	0.56
Motor Vehicles, Automotive Equipment	0.77	2.49	2.78	0.42
Drugs, Chemicals, Allied Products	0.94	1.21	3.05	0.61
Dry Goods, Apparel	0.24	0.41	1.76	0.17
Groceries and Related Products	1.09	2.86	1.96	0.74
Farm Products - Raw Materials	1.01	0.36	1.45	0.81
Electrical Goods	0.88	2.31	2.59	0.30
Hardware: Plumbing, Heating Equip., Supplies	1.58	2.70	2.03	0.54
Machinery, Equip., Supplies	1.11	1.61	2.06	0.44
Metals, Minerals	1.45	0.98	1.30	0.12
Petroleum Bulk Stations, Terminals	1.60	3.29	2.05	1.51
Scrap, Waste Materials	1.84	0.74	1.87	0.52
Tobacco, Tobacco Products	1.78	2.89	2.17	0.82
Beer, Wine, Dist. Alcoholic Beverages	0.42	4.23	1.39	0.77
Paper, Paper Products, excluding Wallpaper	0.53	0.94	1.83	0.24
Furniture, Home Furnishings	0.52	1.53	2.49	0.22
Lumber, Construction Materials	1.99	2.72	1.95	0.54
Other Miscellaneous Products	0.70	1.54	1.93	0.50

Source: U. S. Bureau of the Census.

Table 20

## Wholesale Trade Sales in Selected States By Kind of Business, 1954

(In Millions of Dollars)				
Kind of Business	Alabama	Florida	Georgia	S. C.
Wholesale Trade, Total	2,327	3,402	4,548	1,341
Motor Vehicles, Automotive Equipment	50	101	114	30
Drugs, Chemicals, Allied Products	26	60	57	21
Dry Goods, Apparel	18	23	68	13
Groceries and Related Products	191	325	271	151
Farm Products-Raw Materials	127	15	180	96
Electrical Goods	61	159	118	40
Hardware; Plumbing, Heating, Equipment	86	100	86	36
Machinery, Equipment Supplies	99	181	153	52
Metals, Minerals	16	23	28	N/A
Petroleum Bulk Stations, Terminals	240	422	302	231
Scrap, Waste Materials	33	16	45	11
Tobacco, Tobacco Products	51	88	56	18
Beer, Wine, Distilled Alcoholic Beverages	27	186	81	48
Paper, Paper Products, Excluding Wallpaper	16	31	32	10
Furniture, Home Furnishings	9	38	34	N/A
Lumber, Construction Materials	92	141	75	33
Other Kinds of Businesses	1,186	1,491	2,848	545
Per Cent of U. S. Total:				
Wholesale Trade, Total	0.99	1.45	1.94	0.93
Motor Vehicles, Automotive Equipment	1.26	2.54	2.87	0.75
Drugs, Chemicals, Allied Products	0.77	1.78	2.97	0.62
Dry Goods, Apparel	0.31	0.39	1.16	0.22
Groceries and Related Products	1.20	2.03	1.70	0.94
Farm Products-Raw Materials	1.38	0.16	1.95	1.04
Electrical Goods	0.96	2.51	1.86	0.63
Hardware; Plumbing, Heating Equip., Supplies	1.96	2.27	1.96	0.82
Machinery, Equipment Supplies	0.99	1.80	1.52	0.52
Metals, Minerals	0.48	0.68	0.83	N/A
Petroleum, Bulk Stations, Terminals	1.50	2.63	1.88	1.44
Scrap, Waste Materials	1.37	0.66	1.87	0.46
Tobacco, Tobacco Products	1.59	2.74	1.74	0.56
Beer, Wine, Distilled Alcoholic Beverages	0.47	3.27	1.42	0.84
Paper, Paper Products, excluding Wallpaper	0.54	1.05	1.08	0.34
Furniture, Home Furnishings	0.43	1.83	1.63	N/A
Lumber, Construction Materials	1.40	2.14	1.14	0.50
Other Kinds of Business	0.89	1.12	2.13	0.41

N/A: Not Available or Not Applicable.

Source: U. S. Bureau of the Census.

Table 21

Pattern of Alabama Wholesale Trade in 1958  
by Type of Operation and Kind of Business

SIC Code	Type of Operation and Kind of Business	Total Wholesale Trade		Merchant Wholesalers	
		Establishments (Number)	Sales (\$1,000,000)	Establishments (Number)	Sales (\$1,000,000)
	Wholesale Trade, Total	3,315	2,928	2,171	1,312
	Merchant Wholesalers	2,171	1,312	x	x
	Manufacturers' Sales Branches	301	826	x	x
	Petrol. Bulk Plants	463	322	x	x
	Merchandise Agents, Brokers	286	369	x	x
	Assemblers of Farm Products	94	98	x	x
501	Motor Vehicles, Automotive Equipment	361	180	339	83
502	Drugs, Chemicals, Allied Prod.	94	115	61	44
503	Dry Goods, Apparel	62	35	51	22
504	Groceries and Related Products	570	516	412	286
505	Farm Products, Raw Materials	176	276	69	96
506	Electrical Goods	128	145	103	84
507	Hardware; Plumbing, Heating Equipment	128	125	112	117
508	Machinery, Equipment Supplies	420	284	284	147
5091	Metals, Minerals	78	320	43	46
5092	Petrol. Bulk Stations	463	322	--	--
5093	Scrap, Waste Materials	105	56	97	48
5094	Tobacco, Tobacco Products	45	98	41	66
5095	Beer, Wine, Dist. Alcoholic Beverages	51	36	50	-D-
5096	Paper, Paper Products, excl. Wallpaper	63	35	51	28
5097	Furniture, Home Furnishings	45	26	37	19
5098	Lumber, Construction Materials	179	211	131	79
5099	Other Misc. Products	347	148	290	-D-

(D) Withheld to avoid disclosure

(-- ) Indicates 0

(x) Item not applicable

Source: U. S. Bureau of the Census



Table 22

Pattern of Florida Wholesale Trade in 1958  
by Type of Operation and Kind of Business

SIC Code	Type of Operation and Kind of Business	Total Wholesale Trade		Merchant Wholesalers	
		Establishments (Number)	Sales (\$1,000,000)	Establishments (Number)	Sales (\$1,000,000)
	Wholesale Trade, Total	7,016	5,467	5,019	2,646
	Merchant Wholesalers	5,019	2,646	x	x
	Manufacturers' Sales Branches	488	1,271	x	x
	Petrol. Bulk Plants	608	662	x	x
	Merchandise Agents, Brokers	606	645	x	x
	Assemblers of Farm Products	295	243	x	x
501	Motor Vehicles, Automotive Equipment	655	580	616	210
502	Drugs, Chemicals, Allied Prod.	252	199	180	122
503	Dry Goods, Apparel	140	58	112	38
504	Groceries and Related Products	1,508	1,354	956	601
505	Farm Products, Raw Materials	86	99	31	12
506	Electrical Goods	405	379	343	271
507	Hardware; Plumbing, Heating Equipment	356	213	313	171
508	Machinery, Equipment Supplies	1,008	412	825	291
5091	Metals, Minerals	130	216	97	53
5092	Petrol. Bulk Stations	608	662	--	--
5093	Scrap, Waste Materials	121	23	120	-D-
5094	Tobacco, Tobacco Products	64	159	59	120
5095	Beer, Wine, Dist. Alcoholic Beverages	169	362	156	276
5096	Paper, Paper Products, excl. Wallpaper	142	62	119	51
5097	Furniture, Home Furnishings	204	75	176	55
5098	Lumber, Construction Materials	420	288	325	180
5099	Other Misc. Products	748	324	591	-D-

(D) Withheld to avoid disclosure

(x) Item not applicable

(--) Indicates 0

Source: U. S. Bureau of the Census

Table 23

Pattern of Georgia Wholesale Trade in 1958  
by Type of Operation and Kind of Business

SIC Code	Type of Operation and Kind of Business	Total Wholesale Trade		Merchant Wholesalers	
		Establishments (Number)	Sales (\$1,000,000)	Establishments (Number)	Sales (\$1,000,000)
	Wholesale Trade, Total	5,294	5,682	3,168	1,905
	Merchant Wholesalers	3,168	1,905	x	x
	Manufacturers' Sales Branches	707	2,390	x	x
	Petrol. Bulk Plants	646	413	x	x
	Merchandise Agents, Brokers	606	850	x	x
	Assemblers of Farm Products	167	124	x	x
501	Motor Vehicles, Automotive Equipment	529	647	464	127
502	Drugs, Chemicals, Allied Prod.	209	502	102	89
503	Dry Goods, Apparel	179	253	125	105
504	Groceries and Related Products	790	930	564	352
505	Farm Products, Raw Materials	308	398	90	95
506	Electrical Goods	256	425	141	138
507	Hardware; Plumbing, Heating Equipment	192	161	150	110
508	Machinery, Equipment Supplies	752	525	483	211
5091	Metals, Minerals	104	287	51	67
5092	Petrol. Bulk Stations	646	413	--	--
5093	Scrap, Waste Materials	126	58	124	-D-
5094	Tobacco, Tobacco Products	69	119	63	85
5095	Beer, Wine, Dist. Alcoholic Beverages	81	119	75	-D-
5096	Paper, Paper Products, excl. Wallpaper	121	120	78	46
5097	Furniture, Home Furnishings	108	112	68	38
5098	Lumber, Construction Materials	217	207	153	79
5099	Other Misc. Products	607	407	438	193
	(D) Withheld to avoid disclosure		(--)	Indicates 0	
	(x) Item not applicable				

Source: U. S. Bureau of the Census

Table 24

Pattern of South Carolina Wholesale Trade in 1958  
by Type of Operation and Kind of Business

SIC Code	Type of Operation and Kind of Business	Total Wholesale Trade		Merchant Wholesalers	
		Establishments (Number)	Sales (\$1,000,000)	Establishments (Number)	Sales (\$1,000,000)
	Wholesale Trade, Total	2,332	1,563	1,503	785
	Merchant Wholesalers	1,503	785	x	x
	Manufacturers' Sales Branches	141	171	x	x
	Petrol. Bulk Plants	402	305	x	x
	Merchandise Agents, Brokers	213	268	x	x
	Assemblers of Farm Products	73	35	x	x
501	Motor Vehicles, Automotive Equip.	243	69	237	-D-
502	Drugs, Chemicals, Allied Prod.	60	44	47	40
503	Dry Goods, Apparel	41	25	36	15
504	Groceries and Related Products	413	351	279	187
505	Farm Products, Raw Materials	179	223	75	95
506	Electrical Goods	85	49	78	45
507	Hardware; Plumbing, Heating Equipment	78	43	69	41
508	Machinery, Equipment Supplies	234	112	183	71
5091	Metals, Minerals	30	27	22	15
5092	Petrol. Bulk Stations	402	305	--	--
5093	Scrap, Waste Materials	75	16	70	-D-
5094	Tobacco, Tobacco Products	39	45	37	-D-
5095	Beer, Wine, Dist. Alcoholic Beverages	63	66	62	-D-
5096	Paper, Paper Products, excl. Wallpaper	36	16	30	15
5097	Furniture, Home Furnishings	33	11	26	9
5098	Lumber, Construction Materials	92	57	71	34
5099	Other Misc. Products	229	105	181	59
	(D) Withheld to avoid disclosure	(--) Indicates 0			
	(x) Item not applicable				

Source: U. S. Bureau of the Census

Table 25

Wholesale Trade Establishments in Southeast River Basins Area,  
1939, 1948, 1954 and 1958

Area	Year	Number of Establishments		
		Total Wholesale Trade	Merchant Wholesalers	Other Wholesalers
Southeast River Basins Area, Total				
	1958	6,293	3,813	2,480
	1954	5,359	3,181	2,178
	1948	4,436	2,252	2,184
	1939	3,729	NA	NA
Portion in:				
Alabama	1958	439	277	162
	1954	372	216	156
	1948	323	169	154
	1939	344	NA	NA
Florida	1958	684	450	234
	1954	544	340	204
	1948	352	150	202
	1939	313	NA	NA
Georgia	1958	4,995	2,974	2,021
	1954	4,268	2,513	1,755
	1948	3,659	1,880	1,779
	1939	2,916	NA	NA
South Carolina	1958	175	112	63
	1954	175	112	63
	1948	102	53	49
	1939	156	NA	NA

NA = Not available.

Source: U. S. Bureau of the Census.

Table 26

## Wholesale Trade Sales in Southeast River Basins Area, 1958

Item	Total Study Area	Portion in			
		Alabama	Florida	Georgia	S. Carolina
<u>Total Wholesale Trade Sales:</u>	6,234,500	229,077	379,839	5,538,583	87,001
Merchant Wholesalers <sup>1/</sup>	2,168,645	105,006	193,716	1,829,809	40,114
Other Types <sup>1/</sup> (\$1,000)	4,022,229	109,994	145,070	3,720,278	46,887
<u>Per Cent of U. S. Totals:</u>					
Total Wholesale Trade Sales	2.22	0.08	0.14	1.97	0.03
Merchant Wholesalers	1.81	0.09	0.16	1.53	0.03
Other Types	2.48	0.07	0.09	2.30	0.03
<u>Per Cent of Totals for Respective States:</u>					
Total Wholesale Trade Sales	39.86*	7.82	6.95	97.48	5.57
Total Merchant Wholesalers	32.62*	8.00	7.32	96.03	5.11
Total Other Types	44.73*	6.81	5.14	98.50	6.02

<sup>1/</sup>For some counties, a breakdown of "total wholesale trade sales" is not available; hence, components will not necessarily add to totals.

\*Per cent of 4-state totals.

Source: U. S. Bureau of the Census.

Table 27

Wholesale Trade Sales in Southeast River Basins Area,  
1939, 1948, 1954 and 1958

<u>Item and Year</u>	<u>Total Study Area</u>	<u>Portion in</u>			
		<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. Carolina</u>
Total Wholesale Trade Sales					
1958	6,234,500	229,077	379,839	5,538,583	87,001
1954	4,960,585	179,973	251,890	4,455,875	72,847
1948	3,379,408	116,454	141,623	3,081,426	39,905
1939	877,073	30,365	35,309	792,971	18,428
Per Cent of U. S. Total					
1958	2.22	0.08	0.14	1.97	0.03
1954	2.11	0.08	0.11	1.90	0.03
1948	1.77	0.06	0.07	1.62	0.02
1939	1.59	0.05	0.06	1.43	0.03
Per Cent of Respective State Totals					
1958	39.86*	7.82	6.95	97.48	5.57
1954	42.70*	7.73	7.43	97.98	5.43
1948	43.94*	7.11	7.38	97.90	4.05
1939	23.32*	7.30	6.71	98.35	6.20

\*Per Cent of 4-state totals.

Source: U. S. Bureau of the Census.

Table 28

Wholesale Trade Output Measures for Southeast River Basins Area,  
Compared with Other Areas, 1958

<u>Area</u>	<u>Sales Volume per Establishment (\$1,000)</u>	<u>Ratio, Annual Sales to Annual Payroll</u>
S. E. River Basins Area, Total	990.7	22.3
Portions of Study Area in:		
Alabama	521.8	25.8
Florida	555.3	19.6
Georgia	1,108.8	22.4
South Carolina	497.1	21.6
State of Alabama	883.3	22.0
State of Florida	779.3	18.3
State of Georgia	1,073.3	22.5
State of S. Carolina	670.4	21.1
U. S. Total	1,004.0	21.3

Source: U. S. Bureau of the Census.

Table 29

Retail Trade Establishments in U. S.  
and Selected States, by Kind of Business, 1954 and 1958

Kind of Business	Year	Number of Establishments				
		U. S.	Alabama	Florida	Georgia	S. Carolina
Retail Trade, Total	1958	1,788,325	26,893	49,547	35,452	21,788
	1954	1,721,650	26,158	41,303	32,395	20,581
Lumber, Building Materials, Hardware, Farm, Equipment	1958	108,248	1,028	2,502	1,596	908
	1954	100,519	1,123	1,884	1,373	861
General Merchandise	1958	86,644	2,803	2,182	3,092	2,065
	1954	76,198	2,320	1,538	2,224	1,399
Food Stores	1958	355,508	7,124	8,040	8,933	5,635
	1954	384,616	8,163	7,778	9,378	5,986
Automotive	1958	93,656	1,541	2,881	2,260	1,428
	1954	85,953	1,413	2,079	1,929	1,268
Gasoline Service Sta.	1958	206,302	3,462	6,105	5,023	2,947
	1954	181,747	2,938	4,715	4,113	2,684
Apparel, Accessory	1958	118,759	1,627	3,997	1,972	1,183
	1954	119,743	1,575	3,305	1,913	1,201
Furniture, Home Fur- nishings, Equipment	1958	103,417	1,501	3,373	1,957	1,127
	1954	91,797	1,370	2,601	1,765	1,149
Eating, Drinking Places	1958	344,740	3,221	8,874	4,062	2,500
	1954	319,657	2,886	7,918	3,620	2,153
Drug, Proprietary	1958	56,232	916	1,776	1,162	660
	1954	56,009	900	1,596	1,171	672
Other Retail Stores	1958	240,140	2,605	7,728	4,117	2,741
	1954	226,903	2,568	5,862	3,761	2,609
Nonstore Retailers	1958	74,679	857	2,089	1,278	594
	1954	78,508	902	2,027	1,148	599

Source: U. S. Bureau of the Census



Table 30

Retail Trade Sales in the U. S. and Selected States,  
1939, 1948, 1954, and 1958

Retail Sales (\$1,000,000)	1939	1948	1954	1958
U. S. Total	42,041.8	130,520.5	169,967.7	199,709.6
Alabama	436.0	1,638.9	2,111.8	2,567.2
Florida	614.5	2,340.4	4,014.4	5,839.6
Georgia	624.8	2,111.5	2,963.2	3,528.2
South Carolina	332.2	1,148.2	1,518.9	1,747.3
Per Cent of U. S. Total				
Alabama	1.04	1.26	1.24	1.29
Florida	1.46	1.79	2.36	2.92
Georgia	1.49	1.62	1.74	1.77
South Carolina	0.79	0.88	0.89	0.87

Source: U. S. Bureau of the Census

Table 31

Retail Sales by Kind of Business as Per Cent of Total Retail Sales  
Volume, U. S. and Selected States, 1954 and 1958

Kind of Business	Year	U. S.	Alabama	Florida	Georgia	S.Carolina
Retail Sales, Total (\$1,000,000)	1958	199,709.6	2,567.2	5,839.6	3,528.2	1,747.3
	1954	169,967.7	2,111.8	4,014.4	2,963.2	1,518.9
Per Cent of Each Area's Total Represented By:						
Lumber, Bldg. Materials	1958	7.16	7.05	7.03	7.20	7.51
Hardware, Farm Equip.	1954	7.72	6.48	7.64	6.84	7.50
General Merchandise	1958	10.96	12.84	9.57	12.46	11.81
	1954	10.52	12.54	8.61	11.96	11.22
Food Stores	1958	24.55	24.74	23.37	23.10	25.39
	1954	23.39	24.93	22.74	22.84	24.76
Automotive	1958	15.93	17.57	18.71	17.25	17.79
	1954	17.60	20.52	19.42	19.61	19.70
Gasoline Service Sta.	1958	7.13	7.67	7.31	8.19	8.78
	1954	6.32	6.89	6.69	7.51	8.39
Apparel Accessory	1958	6.27	6.61	6.36	6.02	5.85
	1954	6.52	6.31	7.17	5.77	5.90
Furniture, Home Fur- nishings, Equipment	1958	5.04	5.43	5.60	4.85	5.09
	1954	5.07	5.27	5.74	5.02	6.20
Eating, Drinking Places	1958	7.61	4.55	7.87	4.61	4.38
	1954	7.71	4.53	8.81	4.74	4.12
Drug, Proprietary	1958	3.39	3.48	3.77	3.30	3.41
	1954	3.09	3.10	3.47	3.26	3.20
Other Retail Stores	1958	9.25	8.81	8.62	9.53	8.74
	1954	9.41	8.35	8.04	9.02	8.00
Nonstore Retailers	1958	2.70	1.23	1.76	3.48	1.24
	1954	2.66	1.08	1.66	3.44	1.02

Source: U. S. Bureau of the Census

Table 32

Retail Trade Sales By Detailed Kind of Business in the U. S.,  
With Percentage Shares for Selected States, 1958

Kind of Business	U. S. Total (\$1,000,000)	Per Cent of U. S. Total			
		Alabama %	Florida %	Georgia %	S. Carolina %
Retail Trade, Total	199,709.6	1.29	2.92	1.77	0.87
Lumber, Building Materials	14,309	1.26	2.87	1.78	0.96
Lumber Yards	5,529	0.80	3.45	1.45	0.71
Building Materials	1,593	2.51	4.02	2.39	1.88
Heating, Plumbing Equipment	457	0.44	3.72	1.31	0.66
Paint, Glass, Wallpaper	740	1.08	4.19	0.95	0.54
Electrical Supply	87	1.15	3.45	1.15	1.15
Hardware Stores	2,717	1.77	2.47	2.21	0.92
Farm Equipment	3,186	1.16	1.19	1.95	0.94
General Merchandise Group	21,879	1.51	2.55	2.01	0.94
Department Stores	13,359	0.99	2.34	1.67	0.64
Dry Goods Stores	319	2.51	2.82	2.51	1.25
Sewing, Needlework	44	0.91	2.27	0.76	0.36
Ltd. Price Variety	3,621	1.66	3.23	2.24	0.99
Food Stores	49,022	1.30	2.78	1.66	0.91
Grocery Stores	43,696	1.41	2.90	1.77	0.97
Meat Markets	2,327	0.21	0.99	0.64	0.21
Fish Markets	194	0.52	5.15	1.54	1.03
Fruit Stores	505	0.59	4.55	1.19	0.59
Confectionery Stores	528	0.57	1.14	0.76	0.19
Dairy Products	412	0.24	1.70	0.73	0.49
Bakeries	905	0.33	2.10	0.55	0.22
Egg and Poultry	297	0.34	1.01	2.02	*
Other	91	0.17	4.40	0.37	*

Table 32 (Continued)

Retail Trade Sales By Detailed Kind of Business in the U. S.,  
With Percentage Shares for Selected States, 1958

Kind of Business	U. S. Total (\$1,000,000)	Per Cent of U. S. Total			
		Alabama %	Florida %	Georgia %	S. Carolina %
Automotive	31,808	1.42	3.44	1.91	0.98
Passenger Car Dealers, Franchised	25,326	1.30	3.00	1.80	0.85
Domestic	18,728	1.32	2.75	1.74	0.82
Imported	705	1.28	5.82	1.70	0.71
Domestic and Imported	5,893	1.24	3.48	2.00	0.95
Passenger Car Dealers, NonFranchised	2,983	1.81	5.03	2.51	1.68
Tire, Battery, Accessory Dealers	2,425	2.23	3.92	2.56	1.32
Misc. Aircraft, Marine, Automotive Dlrs.	1,073	1.21	8.11	1.58	1.30
Aircraft, Boat, Motorcycle	429	0.93	8.62	2.10	0.47
Household Trailer Dealers	573	1.22	7.85	1.22	1.75
Other Automotive Dealers	71	4.23	8.45	1.41	1.41
Gasoline Service Stations	14,241	1.38	3.00	2.03	1.07
Apparel, Accessory Stores	12,525	1.36	2.97	1.69	0.81
Men, Boys Apparel, Custom Tailors	2,597	0.81	2.77	1.23	0.65
Women's Clothing, Specialty	4,909	1.08	3.38	1.49	0.73
Shoe Stores	2,130	1.36	2.96	1.55	0.61
Children's, Infants' Wear	431	0.70	3.48	1.39	0.70
Miscellaneous Apparel, Accessory	40	2.50	5.00	0.60	*
Furniture, Home Furnishings, Equipment	10,074	1.38	3.25	1.70	0.88
Furniture, Home Furnishings	5,989	1.49	3.04	1.79	0.99
Furniture	4,783	1.69	3.14	1.98	1.15
Floor covering	703	0.28	2.13	0.71	0.28
Drapery, Curtain, Upholstery	235	0.85	3.40	0.43	0.43
China, Glassware, Metalware	103	0.18	1.94	0.27	0.19
Miscellaneous Home Furnishings	165	1.82	3.64	3.03	0.61

Table 32 (Continued)

Retail Trade Sales By Detailed Kind of Business in the U. S.,  
With Percentage Shares for Selected States, 1958

Kind of Business	U. S. Total (\$1,000,000)	Per Cent of U. S. Total			
		Alabama %	Florida %	Georgia %	S. Carolina %
Household Appliance	2,544	1.49	3.50	1.81	0.83
Radio, Television Stores	956	0.73	4.18	1.15	0.63
Music Stores	586	0.85	2.90	1.19	0.51
Record Shops	141	0.71	2.84	0.71	0.71
Musical Instrument	445	1.12	2.92	1.12	0.45
Eating Drinking Places	15,201	0.77	3.03	1.07	0.51
Eating Places	11,038	0.97	3.33	1.34	0.64
Drinking Places (Alcoholic)	4,164	0.24	2.21	0.36	0.12
Drug Stores, Proprietary Stores	6,779	1.31	3.25	1.73	0.89
Drug Stores	6,531	1.33	2.96	1.73	0.89
Drug Stores with Fountain	3,536	1.50	3.87	2.40	1.19
Drug Stores without Fountain	2,996	1.10	1.87	0.93	0.53
Proprietary Stores	248	1.21	10.89	1.21	0.81
Proprietary Stores with Fountain	133	0.75	9.77	1.50	0.75
Proprietary Stores without Fountain	115	1.74	13.04	1.74	0.33
Other Retail Stores	18,468	1.22	2.72	1.82	0.83
Liquor	4,202	1.26	3.57	1.76	0.76
Antique Stores, 2nd Hand	640	1.56	3.13	2.50	1.25
Antique Stores	88	1.14	2.27	1.14	1.14
2nd Hand Stores	551	1.63	3.45	2.72	1.27
Book, Stationery Stores	679	1.03	2.06	0.88	0.59
Book Stores	196	1.53	1.53	1.02	0.51
Stationery Stores	483	0.83	2.48	0.83	0.62
Sporting Goods, Bicycle Shops	624	1.12	3.21	1.12	0.64
Sporting Goods	573	1.05	3.14	1.05	0.70
Bicycle Shops	50	2.00	4.00	2.00	0.97

Table 32 (Continued)

Retail Trade Sales By Detailed Kind of Business in the U. S.,  
With Percentage Shares for Selected States, 1958

Kind of Business	U. S. Total (\$1,000,000)	Per Cent of U. S. Total			
		Alabama %	Florida %	Georgia %	S. Carolina %
Hay, Grain, Feed Stores	3,117	1.44	1.28	2.86	0.67
Other Farm Supply Stores	737	2.44	4.34	3.80	2.58
Garden Supply Stores	191	2.09	6.81	1.51	1.05
Jewelry Stores	1,495	1.61	2.60	2.27	0.87
Fuel, Ice Dealers	3,473	0.84	2.07	1.18	0.92
Coal and Wood Dealers	920	0.98	0.65	1.09	0.76
Fuel Oil Dealers	1,771	0.06	1.07	0.23	0.56
LP Gas Dealers	715	2.52	6.15	3.50	1.68
Ice Dealers	67	1.49	4.48	2.99	4.48
Florists	638	1.57	2.51	2.04	0.78
Cigar Stores, Stands	233	0.43	1.72	0.43	0.16
News Dealers, Newsstands	285	0.70	2.11	0.70	0.35
Camera, Photographic Supply	382	0.52	2.36	0.26	0.26
Gift, Novelty, Souvenir	389	0.51	6.43	1.03	0.77
Optical Goods	188	1.06	2.66	1.60	0.53
Typewriter Stores	105	0.95	2.86	1.90	0.95
Luggage, Leather Goods	82	0.60	2.44	1.22	0.46
Hobby, Toy, Game Shops	193	1.04	3.63	0.52	0.52
Religious Goods	56	0.32	0.86	0.35	1.79
Pet Shops	49	0.26	2.04	1.51	*
Other	712	0.98	3.65	1.40	*
Nonstore Retailers	5,401	0.59	1.91	2.28	0.41
Mail-order Houses	1,986	0.05	0.60	*	0.01
Merchandise Vending Machine	842	1.07	2.14	*	0.95
Direct Selling Organizations	2,574	0.85	2.84	1.24	0.51

\* State data not available.

Figures may not add to totals because of rounding.

Source: U. S. Bureau of the Census.

Table 33

Retail Trade Establishments in Southeast River Basins Area,  
1939, 1948, 1954 and 1958

Area	Number of Establishments			
	1939	1948	1954	1958
Southeast River Basins Area, Total	41,841	45,193	42,286	43,712
Portion of Study Area in:				
Alabama	4,664	5,046	4,659	4,390
Florida	4,360	5,377	5,572	5,901
Georgia	30,144	32,183	29,301	30,566
South Carolina	2,673	2,587	2,754	2,855

Source: U. S. Bureau of the Census.

Table 34

Retail Sales in S. E. River Basins Area for 1958 and Per Cent  
of Retail Sales in U. S. and Selected States, Selected Years, 1939-1958

Item	Year	Total Study Area	Portion in			
			Alabama	Florida	Georgia	S. Carolina
Total Retail Sales (\$1,000,000)	1958	4,257	305	574	3,180	198
Per Cent of U. S. Total	1958	2.13	0.15	0.29	1.59	0.10
	1954	2.15	0.16	0.27	1.61	0.11
	1948	1.97	0.16	0.21	1.51	0.09
	1939	1.77	0.14	0.17	1.38	0.08
Per Cent of Totals for Respective States	1958	31.11*	11.88	9.83	90.14	11.33
	1954	34.41*	12.97	11.25	92.70	12.04
	1948	35.13*	12.63	11.59	92.07	10.52
	1939	37.02*	13.30	11.58	92.61	10.70

\* Per Cent of 4-State Total.

Source: U. S. Bureau of the Census.



Table 35

Comparative Buying Power and Retail Sales Activity in Southeast River Basins Area, 1948, 1954 and 1958

Item and Area	1948	1954	1958
Aggregate "Buying Power Index," $\frac{1}{\text{U.S. Population}}$			
S. E. River Basins Area (% of U. S.)	2.036	2.142	2.229
Portion in:			
Alabama	0.169	0.161	0.163
Florida	0.221	0.258	0.293
Georgia	1.541	1.595	1.653
South Carolina	0.105	0.128	0.120
Aggregate "Buying Power Index," $\frac{1}{\text{U.S. Population}}$ Divided by Per Cent of U. S. Population ("Quality Index") for			
S. E. River Basins Area	74	75	80
Portion in:			
Alabama	58	59	66
Florida	71	70	76
Georgia	77	79	83
South Carolina	61	68	71
Per Cent of U. S. Retail Sales Divided by Per Cent of U. S. Population ("Index of Sales Activity")			
S. E. River Basins Area	69	67	81
Portion in:			
Alabama	47	44	57
Florida	58	58	86
Georgia	75	73	85
South Carolina	51	51	64

$\frac{1}{\text{U.S. Population}}$  As developed by Sales Management Magazine. It takes into account each locality's proportion of national disposable income, of national retail sales, and of national population..assigning weights of 50,30, and 20 respectively.

Source: Sales Management, Survey of Buying Power.

Table 36

Retail Trade Sales and Payrolls in Southeast River Basins Area,  
Proportions in Cities of 2,500 Inhabitants or More, 1954 and 1958

Item and Area	1954	1958
Sales Volume (\$1,000)		
S. E. River Basins Area	3,647,260	4,256,925
Alabama Portion	274,137	305,300
Florida Portion	451,772	573,645
Georgia Portion	2,738,413	3,180,200
S. Carolina Portion	182,938	197,780
Per Cent of Sales in Cities of 2,500 or More		
S. E. River Basins Area	79.20	79.04
Alabama Portion	79.82	78.64
Florida Portion	69.43	71.86
Georgia Portion	82.34	81.43
S. Carolina Portion	68.26	67.01
Retail Trade Payrolls (\$1,000)		
S. E. River Basins Area	346,581	422,497
Alabama Portion	21,032	25,040
Florida Portion	39,291	56,957
Georgia Portion	271,621	324,326
S. Carolina Portion	14,637	16,174
Per Cent of Payrolls in Cities of 2,500 or More		
S. E. River Basins Area	90.04	85.72
Alabama Portion	86.80	86.59
Florida Portion	75.52	75.18
Georgia Portion	93.18	88.18
S. Carolina Portion	75.26	72.13

Source: U. S. Bureau of the Census

Table 37

Retail Trade Output Measures for S. E. River Basins Area,  
Compared with Other Areas, 1958

<u>Area</u>	<u>Sales Volume per Establishment (\$1,000)</u>	<u>Ratio, Annual Sales to Annual Payroll</u>
S. E. River Basins Study Area, Total	97.4	10.1
Portion of Study Area in:		
Alabama	69.5	12.2
Florida	97.2	10.1
Georgia	104.0	9.8
S. Carolina	69.3	12.2
State of Alabama (Total)	95.5	10.6
State of Florida (Total)	117.9	9.5
State of Georgia (Total)	99.5	10.0
State of S. Carolina (Total)	80.2	10.8
U. S. Total	111.7	9.2

Source: U. S. Bureau of the Census

Table 38

Selected Service Trade Establishments in U. S. and Selected States,  
by Kind of Business for 1939, 1948, 1954 and 1958

Kind of Business	Year	Number of Establishments				
		U. S.	Alabama	Florida	Georgia	S. Carolina
Selected Services Total	1958	975,250	11,153	31,631	15,431	8,305
	1954	785,589	8,882	23,284	12,109	6,432
	1948	665,475	8,165	13,249	10,661	5,448
	1939	656,482	6,860	8,255	10,098	5,351
Hotels, Motels, Tourists Courts Camps	1958	85,580	815	6,442	1,066	733
	1954	66,962	535	5,177	881	516
	1948	55,569	380	3,215	665	377
	1939	41,508	311	1,890	494	210
Personal Services	1958	411,507	5,178	10,248	7,055	3,772
	1954	348,843	4,299	7,676	5,627	2,967
	1948	351,985	4,244	6,087	5,500	2,844
	1939	389,726	3,790	4,657	4,774	2,589
Miscellaneous Business Services	1958	113,923	723	3,697	1,290	480
	1954	88,661	690	2,513	980	403
	1948	32,007	213	682	427	112
	1939	26,188	N. C.	N. C.	N. C.	N. C.
Auto Repair, Services, Garages	1958	125,240	1,765	3,307	2,427	1,363
	1954	94,342	1,226	2,402	1,762	1,036
	1948	95,544	1,423	1,902	1,889	1,057
	1939	78,881	873	1,176	1,227	692
Miscellaneous Repair Services	1958	144,759	1,672	4,351	2,267	1,179
	1954	113,429	1,228	3,055	1,636	817
	1948	80,023	1,102	1,653	1,305	561
	1939	75,262	1,150	944	1,259	634
Motion Pictures	1958	19,545	292	490	386	218
	1954	20,843	343	490	506	291
	*1948	18,631	335	363	377	240
	1939	15,115	202	242	267	154
Amusement Services Excluding Motion Pictures	1958	74,696	708	3,096	940	560
	1954	52,507	561	1,971	717	402
	1948	31,716	468	787	498	257
	1939	29,802	376	692	536	339

\* Published under heading "Motion Picture Theaters, Total."  
N. C.: Not comparable.

Source: U. S. Bureau of the Census.

Table 39

## Selected Services Trade Establishments in U. S. and Selected States, by Detailed Kind of Business, 1958

Item	(Number of Establishments)				
	U. S.	Alabama	Florida	Georgia	S. Carolina
Selected Services, Total	975,250	11,153	31,631	15,431	8,305
Hotels, Motels, Tourist Courts, Camps	85,580	815	6,442	1,066	733
Hotels	29,203	200	1,542	274	184
Motels, Tourist Courts, Trailer Parks, Camps	56,377	615	4,900	792	549
Personal Services	411,507	5,178	10,248	7,055	3,772
Laundries, Ldry. Services, Cleaning, Dye Plants	67,920	1,013	2,000	1,260	757
Power Laundries, Self-Service Laundries	23,692	277	1,006	418	261
Other Laundries and Laundry Services	9,917	32	163	65	27
Cleaning, Dyeing Plants, Incl. Rug Cleaning	34,311	704	831	777	469
Beauty Shops, incl. Comb. Beauty and Barber Shops	110,395	1,514	2,886	2,086	1,053
Barber Shops	105,056	1,459	2,378	1,879	1,105
Photo. Studios, including Commercial Photographers	20,028	186	555	282	103
Shoe Repair, Shoeshine, Hat Cleaners	27,775	363	532	440	226
Funeral Services, Crematories	20,767	176	347	406	245
Pressing Alter. Garment Repair, Fur Repair	39,284	294	780	491	181
Miscellaneous Personal Services	20,282	173	770	211	102
Miscellaneous Business Services	113,923	723	3,697	1,290	480
Auto Repair, Auto Services, Garages	125,240	1,765	3,307	2,427	1,363
Auto Repair Shops	103,724	1,563	2,598	2,176	1,268
Auto Parking	10,998	130	312	111	39
Auto, Truck Rentals, Services, excp. Repair	10,518	72	397	140	56
Miscellaneous Repair Services	144,759	1,672	4,351	2,267	1,179
Electrical Repair Shops	51,269	682	1,554	816	523
Radio, T. V. Repair	37,884	542	1,119	622	424
Other Electrical Repair including Refrigerators	13,385	140	435	194	99
Watch, Clock, Jewelry Repair	11,651	121	407	200	61
Reupholstry, Furniture Repair	15,823	207	543	335	142
Misc. Repair Shops, Related Services	66,016	662	1,847	916	453
Motion Pictures	19,545	292	490	386	218
Motion Picture Production, Distribution, Services	3,191	9	57	35	4
Motion Pictures Theaters	16,354	283	433	351	214
Amusement, Rec. Services, excl. Motion Pictures	74,696	708	3,096	940	560
Bowling, Billiards, Pool	13,916	220	291	238	138
Miscellaneous Amusement, Recreation Services	27,952	488	2,805	702	422

Source: U. S. Bureau of the Census.

Table 40

Selected Service Trade Receipts in U. S. and  
Selected States for 1939, 1948, 1954 and 1958

<u>Item and Area</u>	<u>1939</u>	<u>1948</u>	<u>1954</u>	<u>1958</u>
Selected Service Trade Receipts - Total (Millions of Dollars)				
U. S. Total	4,871.5	13,296.0	23,508.0	32,376.0 <sup>1/</sup>
Alabama	34.7	126.7	181.0	241.9
Florida	90.1	330.3	656.3	992.0
Georgia	57.2	184.9	318.6	425.8
South Carolina	24.4	81.8	123.4	176.8
Per Cent of U. S. Total				
Alabama	0.7	1.0	0.8	0.7
Florida	1.8	2.5	2.8	3.1
Georgia	1.2	1.4	1.4	1.3
South Carolina	0.5	0.6	0.5	0.5

Source: U. S. Bureau of the Census

Table 41

Selected Service Trade Receipts by Kind of Business, as Per Cent  
of Total Receipts, in U. S. and Selected States, 1954 and 1958

Item and Year	U. S.	Alabama	Florida	Georgia	S. Carolina
Total Selected Service Trade Receipts (\$1,000)					
1958	32,376,009	241,883	991,988	425,802	176,799
1954	23,508,019	180,974	656,281	318,561	123,440
Per Cent of Total					
Hotels, Motels, Tourist Courts, Camps					
1958	12.01	11.59	29.99	12.45	12.28
1954	12.88	11.45	30.53	13.22	12.77
Personal Services					
1958	22.84	33.18	20.03	29.65	33.88
1954	24.56	35.57	20.22	30.23	38.58
Miscellaneous Business Services					
1958	30.57	13.38	14.85	18.61	13.62
1954	26.87	14.20	10.24	15.25	7.83
Auto Repair, Auto Services, Garages					
1958	11.90	19.86	12.19	17.45	19.98
1954	9.45	13.45	10.01	11.71	14.35
Miscellaneous Repair Services					
1958	6.99	10.88	7.26	8.70	8.67
1954	7.64	9.64	8.77	8.78	9.14
Motion Pictures					
1958	7.48	6.69	4.99	8.54	5.37
1954	10.00	11.18	8.01	14.95	10.61
Amusement, Recreation Services, (excluding motion pictures)					
1958	8.22	4.42	10.70	4.60	5.87
1954	8.60	5.52	12.21	5.85	6.73

Source: U. S. Bureau of the Census.

Table 42

Selected Service Trade Receipts by Detailed Kind of Business in the U. S.,  
with Percentage Shares for Selected States, 1958

Kind of Business	U. S. Total (\$1,000,000)	Per Cent of U. S. Total			
		Alabama	Florida	Georgia	S. Carolina
Selected Services, Total	32,376	0.75	3.06	1.32	0.55
Hotels, Motels, Tourist Courts, Camps	3,888	0.72	7.64	1.36	0.57
Hotels	2,794	0.54	7.01	1.11	0.35
Motels, Tourist Courts, Trailer Parks, Camps	850	1.53	11.88	2.59	1.53
Personal Services	7,394	1.08	2.69	1.70	0.81
Laundries, Laundry Services, Cleaning, Dye Plants	3,300	1.21	2.97	1.88	0.87
Power Laundries, Self-Service Laundries	1,153	1.30	3.64	1.82	1.13
Other Laundries and Laundry Services	790	0.89	2.91	1.39	0.51
Cleaning, Dyeing Plants, Including Rug Cleaning	1,357	0.74	2.43	2.14	0.96
Beauty Shops, including Comb. Beauty and Barber	1,028	1.17	3.11	1.75	0.68
Barber Shops	783	1.28	2.55	1.79	1.02
Photo Studios, incl. Commercial Photographers	338	0.89	2.66	1.78	0.59
Shoe Repair, Shoeshine, Hat Cleaners	232	1.29	2.16	1.72	0.86
Funeral Services, Crematories	1,015	0.79	2.36	1.67	0.99
Pressing, Alterations, Garment Repair, Fur Repair	407	0.49	1.47	0.98	0.25
Miscellaneous Personal Services	205	0.49	2.44	0.98	0.49
Miscellaneous Business Services	9,897	0.32	1.48	0.80	0.24
Auto Repair, Auto Services, Garages	3,853	0.99	3.14	1.92	0.91
Auto Repair Shops	2,759	1.38	2.65	2.07	1.05
Auto Parking	366	0.82	1.91	1.64	0.27
Auto, Truck, Rentals, Services, Except Repair	728	0.96	5.50	1.65	0.69
Miscellaneous Repair Services	2,262	1.15	3.18	1.64	0.66
Electrical Repair Shops	763	1.18	3.67	1.84	0.79
Radio, T. V. Repair	478	1.26	3.35	1.67	0.84
Other Electrical Repair, including Refrigerators	284	1.06	3.87	2.11	0.35
Watch, Clock, Jewelry Repair	100	0.75	2.97	1.49	0.48
Reupholstry, Furniture Repair	226	0.89	3.10	1.77	0.44
Miscellaneous Repair Shops, Related Services	1,173	1.19	2.98	1.53	0.68
Motion Pictures	2,420	0.66	2.02	1.49	0.37
Motion Picture Production, Distribution, Services	1,249	0.02	0.88	1.20	0.01
Motion Picture Theaters	1,171	1.37	3.25	1.79	0.77
Amusement, Recreation Services, excl. Motion Pictures	2,661	0.41	3.98	0.75	0.38
Bowling, Billiards, Pool	505	0.40	1.78	0.59	0.40
Miscellaneous Amusement, Recreation Services	880	0.91	11.02	1.82	1.02

Source: U. S. Bureau of the Census.



Table 43

Selected Services Trade Establishments <sup>1/</sup>  
in Southeast River Basins Area, Selected Years, 1939-1958

Area	(Number of Establishments)			
	1939	1948	1954	1958
Total Southeast River Basins Study Area	12,664	12,901	15,268	19,615
Portion of Study Area in:				
Alabama	1,605	1,176	1,292	1,567
Florida	924	1,375	2,087	2,921
Georgia	9,205	9,782	11,085	14,085
South Carolina	930	568	804	1,042

<sup>1/</sup> Selected Services total includes S. I. C. numbers 701, 703 (hotels, motels, tourist courts, camps); 72 (personal services); 73 (miscellaneous business services); 75 (auto repair, auto services, garages); 76 (miscellaneous repair services); 78 (motion pictures); and 79 (amusement, vacation services, excluding motion pictures).

Source: U. S. Bureau of the Census.

Table 44

Selected Services Trade Receipts in Southeast River Basins Area  
in 1958, and as Compared with Other Areas, 1939, 1948, 1954 and 1958

Item and Year	Total Study Area	Portion in			
		Alabama	Florida	Georgia	S. Carolina
Receipts, 1958 (\$1,000)	507,477	25,844	60,806	403,308	17,519
Per Cent of U. S. Total Receipts:					
1958	1.57	0.08	0.19	1.25	0.05
1954	1.60	0.08	0.18	1.29	0.05
1948	1.65	0.11	0.18	1.30	0.05
1939	1.30	0.07	0.07	1.12	0.04
Per Cent of Total Receipts of Respective States					
1958	24.41*	10.68	6.13	94.72	9.91
1954	29.56*	10.85	6.57	95.07	10.09
1948	30.35*	11.09	7.28	93.54	10.49
1939	30.73*	10.03	3.98	95.00	8.23

\*Per Cent of 4-State Total.

Source: U. S. Bureau of the Census.

Table 45

Service Trade Employment in Southeast River Basins Area,  
as Derived from Alternative Sources, 1939, 1948, 1954, 1958

Year and Source	Total Study Area	Portion in			
		Alabama	Florida	Georgia	S. Carolina
1958 (a)	60,182	3,355	7,215	47,804	1,808
(b)	107,598	5,757	10,103	88,798	2,940
(c)	57,549	3,366	7,443	45,327	1,413
1954 (a)	51,052	3,111	5,620	40,580	1,741
(b)	94,926	5,450	7,930	78,840	2,706
(c)	53,005	3,144	5,890	42,765	1,206
1948 (a)	46,694	3,082	4,544	37,481	1,587
(b)	78,036	4,882	5,077	65,809	2,268
(c)	47,737	2,969	3,973	39,685	1,110
1939 (a)	30,764	2,000	2,498	25,082	1,184
(b)	63,998	3,572	3,811	53,963	2,652
(c)	34,255	2,133	2,854	28,440	826

(a) U. S. Bureau of the Census, Census of Business for year indicated;  
"Paid Employees, Workweek Ended Nearest November 15."

(b) U. S. Bureau of Labor Statistics. Totals for whole states are allocated to the study area segments by means of data by county collected from state employment security agencies. Estimates for 1939 were derived by using Census of Population data for 1940 as allocators.

(c) State employment security agencies, statistics on employees covered by state employment security programs. Figures for years prior to 1956 have been adjusted to the 1956 basis of coverage.

Source: As indicated in footnotes.

Table 46

Service Trades as a Source of Personal Income in the  
U. S. and Selected States, for Selected Years 1939-1958

<u>Item and Year</u>	<u>Year</u>	<u>U. S.</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>South Carolina</u>
Service Trade Wages and Salaries (\$1,000,000)	1958	23,722	264	700	350	161
Per Cent of Total (all industries) Wages and Salaries	1958	10.02	9.08	13.76	9.13	8.07
	1957	9.55	9.37	13.87	8.92	7.91
	1956	9.31	8.61	13.54	8.95	7.69
	1955	9.17	9.60	13.05	8.79	7.43
	1954	9.09	8.68	12.91	8.69	7.20
	1950	9.41	9.41	14.20	9.80	8.65
	1948	9.26	9.18	14.81	10.04	8.43
	1939	10.31	9.98	15.71	11.43	9.87
Index (U. S. = 100) <sup>1/</sup>	1958	100	90.62	137.33	91.12	80.50
	1954	100	95.49	142.02	95.60	79.20
	1948	100	99.14	159.94	108.42	91.04
	1939	100	96.80	152.38	110.86	95.73

<sup>1/</sup>U. S. percentage of total wages and salaries represented by service trade wages and salaries = 100  
for each year indicated.

Source: U. S. Department of Commerce, Office of Business Economics.

Table 47

Selected Services Trade Payrolls in Southeast River Basins Area,  
for Selected Years, 1939 - 1958

<u>Item and Year</u>	<u>Total Study Area</u>	<u>Portion in</u>			
		<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. Carolina</u>
Selected Services Trade Payrolls (\$1,000)					
1958	139,394	5,980	16,617	112,838	3,959
1954	100,865	4,635	11,144	81,929	3,157
1948	68,395	3,841	6,222	56,347	1,985
1939	18,036	912	1,130	15,468	526

Per Cent of Respective State Totals

1958	27.80	8.94	6.14	95.52	8.68
1954	29.44	8.81	6.57	95.51	9.13
1948	31.26	9.68	6.60	94.20	7.92
1939	32.20	9.47	4.86	94.94	7.70

Estimated Per Cent<sup>\*</sup> of Respective State Totals

1957	28.21	8.94	6.25	95.52	8.79
1956	29.03	8.87	6.36	95.52	8.91
1950	30.66	9.39	6.59	94.64	8.33

\* Estimates derived by simple interpolation from computed percentages for 1948, 1954, and 1958.

Source: U. S. Bureau of the Census.

Table 48

SELECTED SERVICE TRADES AS A SOURCE OF PERSONAL INCOME IN SOUTHEAST RIVER BASINS AREA  
FOR SELECTED YEARS, 1939-1958

		Total Study Area	Portion in:			
			Alabama	Florida	Georgia	South Carolina
Estimated Wages and Salaries						
Selected Service Trades <sup>1/</sup> (\$1,000)	1958	414,900	23,600	43,000	334,300	14,000
	1957	395,800	21,500	40,800	320,000	13,500
	1956	381,000	20,500	36,300	311,400	12,800
	1954	309,000	16,900	27,900	253,100	11,100
	1950	247,300	14,600	19,600	204,400	8,700
	1948	223,300	13,800	18,300	183,700	7,500
	1939	73,600	4,200	3,400	63,600	2,400
Per Cent of Estimated Total						
Wages and Salaries <sup>2/</sup>	1957	8.55	7.20	6.56	9.20	5.91
	1956	8.59	7.00	6.73	9.22	5.82
	1950	7.98	6.26	4.98	8.89	5.09
	1939	6.17	6.19	2.57	6.80	4.19

<sup>1/</sup> Derived by applying to statistics by states of wages and salaries for service trades the ratios developed from Census of Business payroll statistics.

<sup>2/</sup> Estimates of total wages and salaries derived from total personal income estimates. The latter were estimated by Dr. John L. Fulmer for 1939, 1950, and 1956. For 1957, personal income estimates by county were used for Alabama and Florida from studies by their respective university bureaus of business research. For Georgia and South Carolina, the 1956 ratios (study area segments to state totals) were applied to personal income statistics by state for 1957, published by the U. S. Department of Commerce.

"Total wages and salaries" estimates for Alabama and Florida in 1956 and 1957 are from the aforementioned university studies. For the other states and years, the ratio of each state's total wage and salaries to its total personal income was applied to estimated total personal income for that state's study area segment, to yield estimated total wages and salaries in the study area segment.

Table 49

Selected Service Trade Receipts and Payrolls in Southeast River Basins Area:  
Proportions in Cities of 2,500 Inhabitants or More, 1954 and 1958

Item and Area	1954	1958
Total Receipts: (\$1,000)		
Southeast River Basins Area	378,090	507,477
Alabama portion	19,641	25,844
Florida portion	43,150	60,806
Georgia portion	302,846	403,308
South Carolina portion	12,453	17,519
Per Cent of Receipts in Cities of 2,500 or More,		
Southeast River Basins Area	82.83	80.54
Alabama portion	80.40	73.83
Florida portion	72.10	64.90
Georgia portion	85.02	83.97
South Carolina portion	70.34	65.80
Payrolls, Selected Service Trades: (\$1,000)		
Southeast River Basins Area	100,865	139,394
Alabama portion	4,635	5,980
Florida portion	11,144	16,617
Georgia portion	81,929	112,838
South Carolina portion	3,157	3,959
Per Cent of Payrolls in Cities of 2,500 or More,		
Southeast River Basins Area	84.75	84.44
Alabama portion	84.49	80.74
Florida portion	74.88	65.13
Georgia portion	86.60	87.89
South Carolina portion	72.00	72.80

Source: U. S. Bureau of the Census.

Table 50

Output Measures, Selected Service Trades,  
for Southeast River Basins Compared with Other Areas, 1958

<u>Area</u>	<u>Receipts per Establishment (\$1,000)</u>	<u>Ratio, Receipts to Payrolls</u>
Southeast River Basins Area, Total	25.87	3.64
Portion of Study Area in:		
Alabama	16.49	4.32
Florida	20.82	3.66
Georgia	28.63	3.57
South Carolina	16.81	4.43
State of: (Total)		
Alabama	21.69	3.62
Florida	31.36	3.66
Georgia	27.59	3.60
South Carolina	21.29	3.87
U. S. Total	33.20	3.59

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Source: U. S. Bureau of the Census.



This industry division shows a distinct relative downtrend in the past two decades as a source of jobs and earnings. This trend is evident both nationally and in the Southeast, but the decline has been somewhat more pronounced in the four-state area of the Southeast than in the nation as a whole. The division now accounts for about 7 per cent of nonfarm jobs in the study area and the four-state area, as compared with 8 per cent nationally. Wages and salaries in this industry division in 1957 were about 5.4 per cent of total personal income in the State of Alabama, 5.7 per cent in Florida, 6.1 per cent in Georgia, and 3.8 per cent in South Carolina, as compared with a national average of 6.0 per cent. The largest component is railroad wages and salaries, although this component has declined relatively since 1939. Other components of the transportation and public utilities industry division are, in descending order of their proportions of wages and salaries in Georgia (the state most closely approximating the entire study area): communications, highway transportation and warehousing, transportation other than rail and highway, and public utilities.

The total volume of freight movements in a given area is influenced primarily by the volume of output in construction and in goods-producing industries--agriculture, forestry, fisheries, mining, and manufacturing. Shipments figures would be better, of course, but they are not available on a consistent and comprehensive basis. Trends in the magnitude of the total freight load of the study area states and in the nation are indicated indirectly in an accompanying table, which measures construction volume and manufacturing output in constant dollars in 1939, 1947, 1954, and 1959.

#### Railroads

The national railroad track mileage reached its high point around 1920, and has since receded to a level first reached between 1900 and 1910. The trend in railway track mileage since 1870 is shown in Table 53. Track mileage in Alabama, Georgia, and South Carolina follows the national trend, but Florida's high point came about 1930. The four-state area's share of the national total is now somewhat less than it was in 1870. It decreased in the 1870's, then rose steadily until about 1920, when another decline set in. Its 1957 share, 8.5 per cent, is slightly higher than in 1950.

The study area has about 8,200 miles of main line railroad track and a density factor of about 9.5 track miles per 100 square miles of land area. The comparable density measure for the continental United States is about 7.4. Within the study area, the South Carolina portion has the greatest rail density (about 10.9), followed by the Georgia (10.1), Florida (8.4), and Alabama (8.1) areas.

No detailed analysis of railroad facilities and services is made by company, except in one respect. Cities of the study area are examined from the standpoint of whether they are served by two or more competing railroads. Table 55 lists by state and river basin the cities of selected size categories so favored.

The merger trend which is gaining momentum among a number of the nation's railroads is likely to have significant effects in the study area. When and if the pending merger of the Atlantic Coast Line and the Seaboard is completed, competitive relationships within the industry will be greatly altered. The combined system and the rival Southern Railway System will far surpass all other competing railroads in the Southeast in physical and financial resources. Moreover, as anticipated consolidations of facilities and services are put into effect, some communities in the study area now served by one or both of these merging railroads may expect important changes in their own competitive situation relative to other communities.

Cities in the study area now served by the ACL and Seaboard systems, but not by another competing railroad, include: Calhoun Falls, South Carolina; Baldwin, Florida; Fitzgerald, Georgia; Live Oak, Florida; Monticello, Florida; Bainbridge, Georgia; and Chattahoochee, Florida.

A particular city and its freight shippers generally benefit from having effective competition between railroads, as well as between modes of transportation. Cities in the study area which enjoy this comparative advantage are listed in Table 55. They include 20 out of 32 study area cities in the 10,000-and-over population group, and 16 of the 38 cities in the 5,000-to-9,999 group.

#### Highway Transportation

Automobile registrations in Georgia and in the three other principal states represented in the study area have risen steadily since 1939 as percentages of the national total. Table 56 shows that in 1939 Georgia's registration represented 1.47 of the United States total, and the four-state

area had 4.97 per cent. Georgia's ratio rose to 1.72 per cent in 1950, 1.89 in 1955, and 1.93 per cent in 1959. The four-state area's percentage rose to 6.12 in 1950, 7.35 in 1955, and 8.05 in 1959.

Registrations of trucks and buses in Georgia represented about 2.33 per cent of the national total in 1959. The four-state area's total registrations were about 8.30 per cent of the national total in the same year. Table 57 shows that the increase in registrations from 1958 to 1959 was above the national rate of increase in Alabama, Florida, and South Carolina; Georgia's increase was below the national average. In total motor vehicle registrations (automobiles, trucks, and buses), each of the four study area states exceeded the national rate of increase from 1958 to 1959.

Motor-fuel consumption for highway use has been rising substantially faster in each of the principal study area states than in the country as a whole. From 1947 to 1958, for example, consumption in the United States rose from 28.2 billion gallons to 53.4 billion gallons, or about 89 per cent. It more than doubled in Alabama, Georgia, and South Carolina, while in Florida motor-fuel consumption increased some 178 per cent.

Three of the principal study area states have been increasing their road mileages at a rate much greater than the national average. During the period from 1947 to 1958, the increases in Alabama, Florida, and South Carolina totaled some 19 per cent of the total national increase, although these three states represent less than five per cent of total land area in the United States. The road mileage totals include both municipal and rural. Expressing the gains in road miles per 100 square miles of land area, Alabama added 13.7, Florida 26.1, and South Carolina 21.0, as compared with only 5.1 in the country as a whole and 3.8 in Georgia. Georgia's poor showing was heavily influenced by a decrease from 1947 to 1958 in its rural road mileage from 89,680 to 83,918; its municipal roads and streets increased from 5,396 to 13,398 miles in the same period. However, in terms of existing mileage in the terminal year (1958), Georgia had 166 road miles per 100 square miles of land area, far above the national average of 117. South Carolina had 183, Alabama 140, and Florida (with much land unsuitable for roads) only 119.

In "highway traffic density,"--as measured by motor-fuel consumption per mile of highway, road, and street--Florida has consistently been well ahead of the national average, while the other three states have been sub-average. In 1947, for example, almost 11,000 gallons per road mile were consumed in Florida, as compared with the United States average of about 8,500.

Comparable figures for Alabama and South Carolina ranged between 6,000 and 7,000, compared with less than 5,700 in Georgia. The consumption levels since then have risen steadily in all areas. By 1958, Florida's density by this measure was about 23,500 gallons per mile, far above the 15,400 in the nation generally and the 12-to-13,000 in Alabama, Georgia, and South Carolina.

Most study area cities of 10,000 population and above are served by a score or more of interstate common motor carriers of property. The actual number serving each city tends to vary directly with population and inversely with that city's distance from a major metropolitan area. Table 61 shows the number of such common carriers serving each city in two population groups (10,000 and over; 5,000 to 9,999), arranged alphabetically by state.

#### Pipeline Transportation--Liquid Products

Liquid products pipelines are used for major hauls to landlocked areas. Within the study area one major pipeline has delivery stations at Columbus, Macon, Doraville, and Athens, Georgia, and at Belton, South Carolina. A second pipeline runs northward from Port St. Joe, Florida, with delivery stations at Bainbridge, Albany, Americus, Macon, Griffin, and Atlanta. Since 1954 total deliveries at the study area stations have increased from 20.4 million barrels to 30.1 million barrels in 1959. Gasoline represents more than 80 per cent of total deliveries, followed by fuel oil and other distillates, and kerosene.

Table 62 shows deliveries by river basin as well as by product for 1954-1959, inclusive. By basin, the Apalachicola (Basin VII) accounts for more than two-thirds of the total, followed by the Altamaha (Basin III) and the Savannah (Basin I), in the order listed. In 1959, total deliveries in the Savannah Basin were somewhat higher than in the Altamaha, and in most years recorded the Savannah Basin's deliveries of kerosene and of other distillates were higher than those in the Altamaha Basin.

#### Water Transportation<sup>1/</sup>

Total waterborne commodity traffic at the six main deep-draft ports of the study area has been declining in recent years, after an upward trend from 1952 to 1955. The downturn from 1957 to 1958 occurred at five of the

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<sup>1/</sup> This analysis is based on statistics of waterborne commerce tabulated for the U. S. Study Commission, Southeast River Basins by the Board of Engineers for Rivers and Harbors, U. S. Corps of Engineers.

ports (all except Port St. Joe), and may be attributed to the 1957-58 recession. Otherwise, however, the group trend obscures divergent trends at the individual ports.

The Atlantic sub-group of three ports--Brunswick, Fernandina, and Savannah--had a generally rising trend in total traffic from 1947 to 1957. Thus the 1957 total for this sub-group was some 145.5 per cent of its annual average for 1947-1951, inclusive. By contrast, the Gulf sub-group's 1957 total fell sharply from its annual average for the 1952-56 period, and its 1957 level was only 95.8 per cent of its annual average for the 1947-1951 period.

Brunswick's total traffic in 1957 and 1958 was far above that of earlier years. After declines in 1949 and 1950 from the 1947-48 level, it rose steadily through 1953, fell off in 1954, then rose consistently again through 1957.

Fernandina's traffic declined each year from 1947 to 1950, rose each year from 1950 through 1955, and has since fallen each year. Its 1958 tonnage was less than that in 1947, although its lowest year during the entire period was in 1950. 1955 was Fernandina's best tonnage year during the period from 1947 through 1958.

Savannah experienced successive gains in tonnage from the previous year's level from 1947 to 1953. After a minor decline in 1954, it reached its peak in 1955, almost regaining it in 1957 after a 1956 decline. Its tonnage in 1957 and 1958 was substantially above its level for the late '40's.

Panama City's total tonnage almost doubled from 1947 to 1951. It fell in 1952, but then rose each year from 1952 through 1956, declining each year since then. Although its 1957 and 1958 tonnages were considerably below its 1956 peak, they were substantially above the 1947-49 level.

Pensacola's traffic declined precipitously and continuously from 1947 through 1950. After a substantial rise from 1950 to 1951, another period of successive declines set in, from 1951 through 1955. Its traffic then gained in 1956 and 1957, receding once more in 1958. Pensacola's 1947 tonnage was more than three times the level of recent years, and was mainly foreign commerce. Apart from that one apparently abnormal year, the downtrend has been moderate.

Port St. Joe's tonnage has been relatively stable in the 1947-1958 period, fluctuating within a range of more-than-1.4 million short tons to less-than-2.0 million. These fluctuations have been of a up-one-year-down-the-next character, except for successive annual slumps in the 1947-49 and the 1955-57 periods. Its best years were in 1953 and 1955, for the period of observation.

By type of traffic, the six study area ports as a group show a more diversified pattern in recent years of the 1947-1958 period than in the immediate postwar years. Coastwise traffic has been the leading type in every year except 1947 (when Pensacola's abnormally large foreign traffic probably distorted the group pattern). In 1955 through 1958, however, coastwise traffic has represented between 39.6 and 48.0 per cent of the total, compared with more than 50 per cent each year from 1948 through 1951. Foreign commerce has ranked next to coastwise in per cent of total tonnage in each year except 1947, when it was number one. Its proportion has ranged from 25.3 to 37.5 per cent, except in 1947 when it was 47.3 per cent. Since 1948 foreign commerce has tended to gain steadily in relative importance. Inland traffic represented from 14.0 to 18.2 per cent of the total each year from 1947 through 1950, 22.0 to 28.8 per cent in 1951 through 1954, and 20.5 to 23.4 per cent from 1955 through 1958.

At individual ports, the patterns by type of traffic diverge radically from the group pattern. In the Atlantic sub-group, Brunswick's commerce is dominated by inland traffic, although in 1957 and 1958 foreign traffic rose dramatically in relative importance from its negligible proportions of previous years. Coastwise traffic at Brunswick has tended to decline in relative importance. Inland traffic also predominates at Fernandina, followed by coastwise and foreign. Foreign commerce has generally been dominant in Savannah's pattern, particularly in recent years, though coastwise traffic has consistently occupied a strong position. Inland traffic is of relatively minor importance at Savannah.

In the Gulf sub-group of ports, inland traffic has steadily risen in relative importance at Panama City, from 45.6 per cent in 1947 to over 65 per cent in the most recent years. Conversely, coastwise traffic has fallen from 45.9 per cent of the total in 1947 to 26.1 per cent in 1958. Foreign commerce has remained relatively unimportant at Panama City. Inland traffic has also been dominant each year at Pensacola, except in 1947 and 1948 when foreign commerce was the leading type. Coastwise commerce there has been negligible, but at Port St. Joe it has represented well over 95 per cent of the total almost every year.

In terms of commodity composition, the water commerce at the Atlantic and Gulf deep-draft ports is dominated by petroleum and its products. The proportion of total traffic represented by this commodity group is a good deal higher for the Gulf sub-group than for the Atlantic sub-group of ports.

Other important commodities and commodity groups for the Atlantic sub-group include gypsum; wood pulp and paper; sugar; fertilizers and materials; sulphur; chemicals; salt; and iron and steel scrap. For the Gulf sub-group, other important commodities include paper; logs and lumber; chemicals; fertilizers and materials; cement; shells, animal feeds; and naval stores.

Receipts and shipments have totaled well over a million short tons on the study area's intracoastal waterways during many recent years. Traffic on the Gulf Intracoastal Waterway is of far greater magnitude than on the Atlantic Intracoastal Waterway. The Gulf's two outstanding commodities are petroleum products and shells; logs and pulpwood dominate the traffic on the Atlantic.

#### Air Transportation

Among states of the study area, Florida leads in total number of airports, including both civil and military, with 140. North Carolina (with 99) and Georgia (with 94) are followed in ranking by Alabama (68) and South Carolina (64). Ranked according to airports which are both paved and lighted, Florida is first again (44), followed by Georgia (25), North Carolina (21), Alabama (17), and South Carolina (12). Table 64 classifies each of these states' general airports by length of runway.

The country's more important airports are termed air traffic hubs by the Federal Aviation Agency, and these are sub-classified as small, medium, and large. Atlanta has the only large air traffic hub in the study area; there are no medium hubs in the study area proper; and there are small hubs at Pensacola, Tallahassee, Augusta, Columbus, Macon, and Savannah. In addition, there is a medium hub quite near the study area at Jacksonville, Florida, plus small hubs at Mobile, Alabama and Greenville, South Carolina; each of these is within commuting distance of some parts of the study area proper. Atlanta's air passenger traffic in fiscal year 1959 represented some 2.2 per cent of the national total; such traffic at each of the smaller hubs amounted to a fraction of one per cent. Even more significantly, freight cargo at the Atlanta airport represented almost 12 per cent of the national total.

#### Communications

Telephone development in states of the study area made great strides from 1950 to 1958, but by national norms there is room for further growth. All of the study area states were behind the United States average in 1950



and 1958 in total telephones per 1,000 people and percentage of households with telephone service. By 1958, however, the gap was much narrower and Florida was about even. The 1958 distribution between standard metropolitan areas and nonmetropolitan areas was about the same in Florida as in the nation generally, but in other study area states it was quite different. Telephones in nonmetropolitan areas represented from 37.4 per cent of the state total (Alabama) to 60.2 per cent (North Carolina), as compared with the national average of only 27.6 per cent. Growth in total telephones and in households with telephones was much greater in every study area state than in the country generally from 1950 to 1958.

Estimates of telephone development in the study area indicate increases in total number of telephones from 1950 to 1959 ranging from about 96 per cent in the Georgia area to 155 per cent in the South Carolina area. Growth in the Florida and South Carolina segments appears to have been much more rapid from 1950 to 1955 than from 1955 to 1959; in Georgia it was about the same during the two periods; and in the Alabama portion the increase was much more rapid in 1955-1959.

Among the study area's largest telephone exchange areas, Atlanta's 416 telephones per 1,000 people may be compared with 427 in Houston and 376 in New Orleans, to cite two "outside" cities of comparable size. The percentage of households with telephone service is 77 in Atlanta and Houston, and 78 in New Orleans. Comparable figures for the other major cities of the study area range from 59 per cent in Columbus to 70 per cent in Pensacola--with Augusta, Macon, and Savannah inside this range. One of the national metropolitan pacemakers in this respect is Washington, D. C., where 90 per cent of all households have telephone service and where there are some 700 telephones per 1,000 people.

Florida and North Carolina lead the study area states in numbers of radio and television broadcast authorizations. This leadership extends to nearly all categories--A. M. radio, commercial F. M. radio, educational F. M. radio, and commercial television. In educational television, Alabama ranks second with three authorizations to Florida's four; Georgia has two, North Carolina has one, and South Carolina none. North Carolina is number one in commercial F. M. radio authorizations, with Florida second. The tallest TV tower in the study area belongs to station WJBF in Augusta, Georgia.



### Electric Utilities

Electric power output has increased much more rapidly than has the constant dollar volume of public utility operations generally during the period 1939-1959. This statement applies to the country as a whole and to the principal study area states, both individually and collectively. Moreover, the increases have been sharper, for both measures, in each of the four study area states than in the nation generally. It should be emphasized, however, that this is another case of a catching-up process--the Southeast started from a low base. The four states, representing 6.53 per cent of total land area and 7.37 per cent of total population of the United States in 1939, produced 6.35 per cent of total electric energy; by 1957 it was producing 8.07 per cent and it had about 7.93 per cent of the total population. Generating plants in the four states have increased their production each year, with only two exceptions--Georgia from 1953 to 1954 and Alabama from 1956 to 1957. The annual growth rates are higher than the U. S. annual growth rate, 9.2 per cent, for three of the four states. South Carolina fell 0.4 per cent below the U. S. rate. Alabama has produced the largest amount of energy throughout the period. Steam and internal combustion plants have produced the greater amount of energy in all four states since 1952.

The U. S. and the four states in the Southeast have experienced continuous growth in electric energy generating capacity since 1939. Steam and internal combustion plants have dominated the growth picture during this period. Florida's total increase in generating capacity was in the steam and internal combustion type plants from 1947 to 1954. Alabama's hydroelectric plants have not increased in capacity since 1952. Georgia and South Carolina have also had greater advances in steam and internal combustion plants than in hydroelectric plants. Florida has the highest annual growth rate, 10.7 per cent for 1939 to 1957; Alabama is second with 7.8 per cent, 1939 to 1957; Georgia and South Carolina, respectively 8.0 per cent and 5.5 per cent. All of these states' annual growth rates compare favorably with the U. S. annual growth rate of 6.9 per cent for the same period. Capacity in 1939 was greatest in Alabama (982,000 kilowatts), and it remained greatest there up to and including 1957, when it was 3.8 million KW. Relative positions changed among the three other main study area states, however. Florida moved from fourth to second, and South Carolina fell from second to fourth.

Estimated per capita sales of electric energy in the study area rose from 483 kilowatt hours in 1940 (when the national average was 899 KWH) to 1,325 in 1950 and 2,270 KWH in 1956 (when the national average was 3,170). Thus, the rate of increase was greater in the study area from 1940 to 1950 (about 10.6 per cent annually versus 7.6 per cent), and slightly higher than the national average from 1950 to 1956 (9.4 per cent annually versus 9.3 per cent). The Florida segment has maintained the highest growth rate among intrastate areas in the study area during the 1940-1956 period, and its growth is proceeding at an increasing rate. However, the South Carolina portion leads the others in absolute sales per capita--industrial sales appear to account for the difference. Sales growth in the Alabama portion has increased at an almost constant rate of 10.6 per cent yearly throughout the 1940-1956 period. Georgia's annual growth rate has experienced some decline since 1950.

Total sales of electric energy in the entire study area have risen from about two billion KWH in 1939 and 1940 to almost 12 billion KWH in 1958. The Georgia portion accounted for almost 73 per cent of this.

#### Gas Utilities

There appears to be much room for further development of gas utility services in the study area states before the national average stage of development is reached. In terms of gas customers per 1,000 population, for example, each of the study area states is far behind the national average. The discrepancy is wider as regards residential customers than in the cases of commercial customers. Climate would appear to be the dominant factor in the regional differential.

In total revenues per capita, the gas utility industry in Alabama (with \$21.19) is not far below the national average (\$24.29); its industrial revenues are much higher (\$10.12 to \$6.75). Georgia's is second in total revenues per capita among the four principal study area states, with \$18.30. South Carolina (\$6.33) and Florida (\$5.70) may expect much further growth of their gas utility industries in the future.

Table 51

Wages and Salaries in Transportation and Public Utilities  
as Per Cent of Total Wages and Salaries, for Selected Areas:  
1939 - 1957 (Selected Years)

Item	Year	Per Cent of Total Wages and Salaries		
		U.S.	Four Study Area States <sup>1/</sup>	Georgia
<u>Transportation, total</u>	1957	5.90	5.58	5.99
	1950	6.76	6.69	6.85
	1947	7.42	7.92	8.40
	1939	7.49	7.70	8.36
Railroads	1957	2.57	2.39	2.98
	1950	3.59	3.79	4.44
	1947	4.08	4.61	5.48
	1939	4.56	5.63	6.82
Highway freight and warehousing	1957	1.64	1.30	1.73
	1950	1.38	0.91	1.09
	1947	1.16	0.70	0.86
	1939	0.96	0.66	0.68
Other transportation	1957	1.69	1.90	1.28
	1950	1.80	2.01	1.31
	1947	2.18	2.61	2.06
	1939	1.96	1.42	0.85
<u>Communications and public utilities, total</u>	1957	3.05	2.79	2.93
	1950	2.84	2.70	3.00
	1947	2.69	2.43	2.91
	1939	3.21	3.17	3.41
Telephone and other communications	1957	1.72	1.64	1.78
	1950	1.57	1.44	1.72
	1947	1.50	1.36	1.83
	1939	1.52	1.47	1.71
Electric, gas, other public utilities	1957	1.33	1.16	1.17
	1950	1.34	1.24	1.27
	1947	1.20	1.05	1.09
	1939	1.69	1.58	1.71
Grand total	1957	8.95	8.36	8.92
	1950	9.60	9.39	9.85
	1947	10.11	10.35	11.31
	1939	10.70	10.87	11.77

<sup>1/</sup>Alabama, Florida, Georgia, and South Carolina.

Source: U. S. Department of Commerce, Office of Business Economics.

Table 52

Measures of Output Relevant to Transportation and Public Utilities,  
for U. S. and Selected States, 1939, 1947, 1954, and 1959

(In millions of constant 1957 dollars, unless otherwise noted.)

Item	Year	U. S.	Alabama	Florida	Georgia	S. C.
Business volume	1959	1,179,818	13,946	24,191	20,137	9,062
	1954	954,503	10,536	15,046	15,752	7,599
	1947	799,772	8,928	8,991	12,218	5,849
	1939	455,313	4,265	4,457	6,085	2,927
Utility operation	1959	60,311	588	1,398	927	295
	1954	49,036	528	885	686	235
	1947	38,800	476	655	543	165
	1939	27,826	249	362	342	119
Electric power output (Millions of KWH)	1959	794,508	24,740	17,867	12,681	11,297
	1954	544,646	17,234	10,008	8,121	6,399
	1947	307,400	8,458	3,757	3,955	3,484
	1939	130,336	3,943	1,150	1,612	1,568
Construction volume	1959	52,374	545	1,871	731	393
	1954	39,553	385	989	579	492
	1947	22,536	223	524	359	279
	1939	16,603	213	283	235	164
Manufacturing output	1959	346,740	4,698	3,690	5,666	3,598
	1954	274,600	3,234	2,162	4,089	2,730
	1947	229,490	2,682	1,120	3,106	1,977
	1939	115,067	1,164	490	1,370	806

Source: Industrial Development, 1960 Blue Book Edition, May 1960.

Table 53

Railroads: Miles of Road Owned in the U. S. and Selected States,  
for Selected Periods, 1870 - 1957

<u>Year</u>	<u>U. S. Total</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. C.</u>	<u>Four-State Total as % of U. S.</u>
1870	52,922	1,157	446	1,845	1,139	8.66
1880	93,267	1,843	518	2,459	1,427	6.69
1890	163,597	3,314	2,471	4,532	2,194	7.64
1900	193,346	4,226	3,299	5,652	2,818	8.27
1910	240,439	5,226	4,432	7,056	3,442	8.38
1920	252,845	5,378	5,212	7,326	3,814	8.59
1930	249,052	5,249	5,666	6,671	3,780	8.57
1940	233,670	4,996	5,218	6,334	3,466	8.56
1950	223,779	4,723	4,793	6,043	3,223	8.39
1957	219,067	4,669	4,688	5,933	3,288	8.45

Source: Statistical Abstract of the U. S.

Table 54

## Railroad Mileages and Densities in the U. S. and the Study Area

Area	Main Lines of Track (miles)	Land Area (sq. miles)	Track Miles per 100 sq. miles
Study Area, Total	8,211	86,543	9.49
Portion of study area in:			
Alabama	900 <sup>a</sup>	11,155	8.07
Florida	1,620 <sup>b</sup>	19,241	8.42
Georgia	5,203 <sup>a</sup>	51,513	10.10
South Carolina	488 <sup>c</sup>	4,459	10.94
United States, Total <sup>d</sup>	219,067 <sup>e</sup>	2,974,726	7.36

(a) 1960 data, based on information from state agencies.

(b) Estimate based on data in 1958 publications of state agencies and The Official Guide of the Railways.

(c) Estimate based on railroad map measurement and 1956 data from South Carolina Development Board .

(d) 48 states.

(e) As of 1957.

Table 55

Study Area Cities of 5,000 Population and Over Served by Two or  
More Competing Railroads\*

A. Cities of 10,000 population and over		B. Cities of 5,000-9,999 population	
State and City	River Basin	State and City	River Basin
Alabama - Dothan	VII, VIII	Alabama - Andalusia	VIII
- Opelika	VII	- Atmore	VIII
		- Ozark	VIII
Florida - Pensacola;		- Troy	VIII
West Pensacola	VIII		
Georgia - Albany	VII	Florida - Lake City	V
- Americus	VII	- Perry	VI
- Athens	III		
- Atlanta	III, VII	Georgia - Cordele	VII
- Augusta	I	- Covington	III
- Brunswick	IV	- Douglas	IV
- Columbus	VII	- Elberton	I
- Dublin	III	- Fort Valley	VII
- East Point	VII	- Milledgeville	III
- Gainesville	VII	- Newnan	VII
- Griffin	VII	- Statesboro	II
- Macon	III	- Tifton	V
- Moultrie	V, VI	- Vidalia	III
- Savannah	I		
- Valdosta	V		
S. C. - Anderson	I		
- Greenwood	I		
Summary by River Basins:		Summary by River Basins:	
Basin I.... 4		Basin I.... 1	
Basin III.. 3 entire, 1 shared		Basin II... 1	
Basin IV... 1		Basin III.. 3	
Basin V.... 1 entire, 1 shared		Basin IV... 1	
Basin VI... 1 shared		Basin V.... 2	
Basin VII.. 7 entire, 2 shared		Basin VI... 1	
Basin VIII. 1 entire, 1 shared		Basin VII.. 3	
		Basin VIII. 4	

\* Exclusive of switching or terminal railroads, manufacturer-owned railroads, and others serving extremely small territories. In view of the pending ACL-Seaboard merger, these railroads, and those they now control, are considered as one for the purpose of this tabulation.

Table 56

Automobile Registrations in the U. S. and Selected States,  
for Selected Years, 1939 - 1959

(In Thousands)							
<u>Year</u>	<u>U. S.</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. C.</u>	Georgia as Per Cent of <u>U. S.</u>	Four States as Per Cent of U. S.
1939	26,201	267	378	387	271	1.47	4.97
1940	27,435	277	415	415	290	1.51	5.09
1947	30,719	359	553	500	356	1.62	5.75
1950	40,185	510	799	692	462	1.72	6.12
1954	48,324	718	1,181	893	579	1.84	6.97
1955	51,989	832	1,368	986	636	1.89	7.35
1956	54,004	871	1,513	1,015	658	1.87	7.51
1957	55,693	906	1,684	1,054	665	1.89	7.73
1958	56,871	925	1,784	1,080	682	1.89	7.86
1959	58,591	966	1,913	1,131	708	1.93	8.05

Source: U. S. Department of Commerce, Bureau of Public Roads.



Table 57

Motor-Vehicle Registrations, U. S. and Selected States,  
1958 and Estimates for 1959

(In Thousands)						
<u>Item</u>	<u>Year</u>	<u>U. S. Total</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. Carolina</u>
Total motor vehicles	1959	70,416	1,197	2,223	1,407	872
	1958	68,299	1,146	2,077	1,348	839
Automobiles	1959	58,591	966	1,913	1,131	708
	1958	56,871	925	1,784	1,080	682
Trucks and buses	1959	11,825	231	310	276	164
	1958	11,429	221	293	269	157
<u>Per Cent Increase, 1958 to 1959</u>						
Automobiles		3.0	4.4	7.2	4.7	3.8
Trucks and buses		3.5	4.7	5.9	2.7	4.5
Total motor vehicles		3.1	4.5	7.0	4.3	3.9

Source: U. S. Department of Commerce, Bureau of Public Roads

Table 58

Existing Road Mileage in the United States and Selected States,  
1947 and 1956-1958

	<u>1947</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>
United States				
Total Mileage	3,326,153	3,429,801	3,453,118	3,478,787
Municipal	316,536	378,419	389,195	404,594
Rural	3,009,617	3,051,382	3,063,923	3,074,193
Alabama				
Total Mileage	64,348	69,975	70,797	71,359
Municipal	4,306	7,960	8,637	8,896
Rural	60,042	62,015	62,160	62,463
Florida				
Total Mileage	50,694	60,928	62,410	64,840
Municipal	11,908	13,973	14,474	15,265
Rural	38,786	46,955	47,936	49,575
Georgia				
Total Mileage	95,076	95,626	95,964	97,316
Municipal	5,396	12,639	12,726	13,398
Rural	89,680	82,987	83,238	83,918
South Carolina				
Total Mileage	49,189	54,128	54,643	55,540
Municipal	2,947	4,694	5,029	4,918
Rural	46,242	49,434	49,614	50,622
Four-State Area				
Total Mileage	259,307	280,657	283,814	289,055
Municipal	24,557	39,266	40,866	42,477
Rural	234,750	241,391	242,948	246,578

Source: U. S. Bureau of Public Roads.

Table 59

Motor-Fuel Consumption for Highway Use in the United States  
and Selected States, 1947, 1950, 1956-1958

	(In Thousands of Gallons)				
	<u>1947</u>	<u>1950</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>
United States	28,215,705	35,652,940	50,214,299	51,864,631	53,418,468
Alabama	403,851	526,142	833,988	862,368	909,236
Florida	549,090	719,683	1,331,698	1,454,882	1,525,619
Georgia	540,087	706,796	1,124,187	1,161,457	1,215,791
South Carolina	324,961	425,392	640,949	653,823	674,819

Source: U. S. Bureau of Public Roads.

Table 60

Highway Traffic Density for Principal Study Area States,  
Compared with United States Average, 1947, 1950, 1956-1958

	Thousands of Gallons of Motor-Fuel for Highway Use Per Mile of Highway, Road, & Street				
	<u>1947</u>	<u>1950</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>
Alabama	6.28	8.19	11.92	12.18	12.74
Florida	10.83	13.99	21.86	23.31	23.53
Georgia	5.68	7.49	11.76	12.10	12.49
South Carolina	6.61	8.52	11.84	11.97	12.15
United States, Average	8.48	10.73	14.64	15.02	15.36

Source: U. S. Bureau of Public Roads.

Table 61

Service to Selected Cities in Southeast River Basins Area  
by Interstate Common Motor Carriers of Property, as of June 1960

State	City	River Basin (s)	Number of Common Carriers in Interstate Service <sup>1/</sup>
Cities of 10,000 or over			
Alabama	Dothan	VII, VIII	16
	Opelika	VII	17
	Phenix City	VII	16
Florida	Panama City	VIII	13
	Pensacola	VIII	16
	Tallahassee	VI	16
	Warrington	VIII	12
	West Pensacola	VIII	6
Georgia	Albany	VII	22
	Americus	VII	19
	Athens	III	30
	Atlanta	III, VII	68
	Augusta	I	30
	Brunswick	IV	15
	College Park	VII	51
	Columbus	VII	28
	Decatur	III	51
	Dublin	III	15
	East Point	VII	51
	Gainesville	VII	25
	Griffin	VII	21
	LaGrange	VII	21
	Macon	III	30
	Marietta	VII	37
	Moultrie	V, VI	14
	Savannah	I	33
	Thomasville	VI	21
	Valdosta	V	22
	Waycross	IV	19
South Carolina	Aiken	I	26
	Anderson	I	40
	Greenwood	I	30

<sup>1/</sup>Includes intrastate carriers authorized to handle interstate shipments with connecting carriers, but not required to obtain interstate operating authority.

Source: Southern Motor Carriers Rate Conference.

Table 61 (Continued)

Service to Selected Cities in Southeast River Basins Area  
by Interstate Common Motor Carriers of Property, as of June 1960

<u>State</u>	<u>City</u>	<u>River Basin (s)</u>	<u>Number of Common Carriers in Interstate Services <sup>1/</sup></u>
Cities of 5,000 - 9,999			
Alabama	Andalusia	VIII	14
	Atmore	VIII	15
	Brewton	VIII	13
	Enterprise	VIII	11
	Eufaula	VII	13
	Greenville	VIII	12
	Lanett	VII	15
	Opp	VIII	13
	Ozark	VIII	11
	Troy	VIII	13
Florida	Crestview	VIII	11
	Lake City	V	13
	Marianna	VII	14
	Perry	VI	9
	Quincy	VI	11
Georgia	Bainbridge	VII	17
	Cairo	VI	11
	Carrollton	VII	13
	Cordele	VII	18
	Covington	III	17
	Douglas	IV	13
	Elberton	I	14
	Fort Valley	VII	18
	Hapeville	VII	50
	Milledgeville	III	15
	Newnan	VII	20
	North Atlanta	VII	36
	Statesboro	II	13
	Thomaston	VII	18
	Tifton	V	17
	Toccoa	I	17
	Vidalia	III	12
	Warner Robins	III	17
South Carolina	Abbeville	I	25
	Easley	I	34
	North Augusta	I	24

<sup>1/</sup> Includes intrastate carriers authorized to handle interstate shipments with connecting carriers, but not required to obtain interstate operating authority.

Source: Southern Motor Carriers Rate Conference.

Table 62

Pipeline Deliveries of Liquid Petroleum Products in Southeast River Basins Area, by River Basin and by Product, 1954 - 1959

		(In Thousands of Barrels)				*
		Southeast River Basins				
Item and Year		I	III	VII	Total	
Total, liquid petroleum products						
	1959	4,930.0	4,606.2	20,584.5	30,120.7	
	1958	4,462.6	4,743.9	18,987.3	28,193.8	
	1957	3,942.3	4,609.3	17,669.5	26,221.1	
	1956	3,705.1	4,646.5	16,321.0	24,672.6	
	1955	3,080.8	4,342.7	15,674.5	23,098.0	
	1954	2,552.9	3,331.1	14,500.2	20,384.2	
Gasoline						
	1959	3,367.8	3,756.1	17,029.0	24,152.9	
	1958	2,726.4	3,790.6	15,683.5	22,200.5	
	1957	2,411.0	3,711.0	14,979.2	21,101.2	
	1956	2,305.2	3,725.5	14,081.8	20,112.5	
	1955	2,018.8	3,493.7	13,385.6	18,898.1	
	1954	1,756.5	2,595.0	12,269.8	16,621.3	
Kerosene						
	1959	688.8	230.9	941.4	1,861.1	
	1958	804.7	272.8	797.9	1,875.4	
	1957	672.4	268.2	739.6	1,680.2	
	1956	616.7	281.7	739.9	1,638.3	
	1955	620.4	268.5	784.4	1,673.3	
	1954	504.7	268.8	836.7	1,610.2	
Other distillates (fuel oil, etc.)						
	1959	873.4	619.2	2,614.1	4,106.7	
	1958	931.5	680.5	2,505.9	4,117.9	
	1957	858.9	630.1	1,950.7	3,439.7	
	1956	783.2	639.3	1,499.3	2,921.8	
	1955	441.6	580.5	1,504.5	2,526.6	
	1954	291.7	467.3	1,393.7	2,152.7	

\* No pipeline stations for delivery of liquid products are located in other drainage basins of the Southeast River Basins area.

Source: Pipeline companies operating in the area.

Table 63

Civil and Military Airports, by Type, in U. S.  
and Selected States, as of December 31, 1958\*

State	Total	General	Limited	Restricted	Paved Airports	
					Lighted	Not Lighted
Alabama	68	33	30	5	17	16
Florida	140	93	42	5	44	28
Georgia	94	45	46	3	25	16
North Carolina	99	59	35	5	21	6
South Carolina	64	32	30	2	12	7
U. S. (48 States) Total	5,688	2,748	2,465	475	1,106	476

\*Includes seaplane bases and heliports.

Source: Federal Aviation Agency, FAA Statistical Handbook of Aviation,  
1959 Edition.



Table 64

General Airports by Length of Runway, U. S. and Selected States,  
as of December 31, 1958

State	Total General Airports	Airports by Length of Runway (in feet)						
		0-2,999	3,000- 3,499	3,500- 4,199	4,200- 4,999	5,000- 5,899	5,900- 6,999	7,000 and Over
Alabama	33	9	3	7	4	6	0	4
Florida	93	24	7	14	4	29	3	12
Georgia	45	13	3	6	8	11	0	4
North Carolina	59	25	5	7	12	6	1	3
South Carolina	32	12	2	2	1	11	3	1
U. S. (48 States) Total	2,748	1,138	356	388	224	337	98	207

Source: Federal Aviation Agency, FAA Statistical Handbook of Aviation,  
1959 Edition.

Table 65

## U. S. Air Traffic Hubs by Urban Population Size Groups

<u>Urban Population Size Group</u>	<u>Air Traffic Hubs</u>		
	<u>Large</u>	<u>Medium</u>	<u>Small</u>
Large SMSA <sup>*</sup>	22	27	5
Medium SMSA <sup>*</sup>	--	10	30
Small SMSA <sup>*</sup>	--	2	25
Cities 25,000 - 49,999	--	1	26
Cities 10,000 - 24,999	--	1	5
Cities under 10,000	--	--	--
Total	22	41	91

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<sup>\*</sup> SMSA = Standard Metropolitan Statistical Areas, as defined by the U. S. Bureau of the Census. Large SMSA = 300,000 population or more; medium SMSA = 150,000 - 299,999; small SMSA = 50,000 - 149,999.

Source: Federal Aviation Agency, Air Commerce Traffic Pattern, Fiscal Year 1959.

Table 66

Domestic On-Line Originations at Airports in or Near the Southeast  
River Basins Area, Fiscal Year 1959

State and City	Airport Type <sup>1/</sup>	Aircraft Departures	Passengers	Tons Airmail	Tons Cargo	Passengers as Per Cent of U. S. Total
<u>Alabama</u>						
Dothan <sup>2/</sup>	N	2,950	9,914	13.6	19.7	.02
Mobile <sup>2/</sup>	S	8,493	87,497	292.1	553.2	.19
<u>Florida</u>						
Eglin (AFB) <sup>2/</sup>	N	884	9,628	5.8	22.7	.02
Gainesville <sup>2/</sup>	N	1,565	7,804	8.5	30.7	.02
Jacksonville <sup>2/</sup>	M	25,592	282,509	1,859.7	1,290.4	.62
Marianna	N	653	563	2.4	15.6	--
Panama City	N	3,236	15,204	31.9	16.5	.03
Pensacola	S	5,336	46,292	138.2	228.3	.10
Tallahassee	S	5,282	41,576	41.4	97.2	.09
<u>Georgia</u>						
Albany	N	3,629	14,014	44.7	32.3	.03
Athens	N	1,196	3,695	9.1	19.8	.01
Atlanta	L	69,952	995,222	3,867.8	16,500.6	2.19
Augusta	S	5,785	36,277	52.5	92.7	.08
Brunswick	N	1,918	6,507	9.0	13.5	.01
Columbus	S	7,034	38,867	71.1	129.0	.09
Macon	S	4,515	28,093	401.9	62.0	.06
Moultrie	N	1,951	2,743	14.4	3.8	.01
Savannah	S	5,282	42,475	57.9	181.6	.09
Valdosta	N	2,576	5,188	25.1	63.9	.01
Waycross	N	945	2,203	1.6	10.4	--
<u>South Carolina</u>						
Anderson	N	1,262	3,288	4.2	43.8	.01
Greenville <sup>2/</sup>	S	8,090	53,708	101.2	409.8	.12
Greenwood	N	1,170	1,559	4.5	10.2	--

<sup>1/</sup>Key to symbols, for types of airports as classified by the Federal Aviation Agency:

L = Large hub  
M = Medium hub  
S = Small hub  
N = Nonhub

<sup>2/</sup>Near, but not actually in, the study area.

Source: Federal Aviation Agency, Air Commerce Traffic Pattern, Fiscal Year 1959.

Table 67

All-Cargo Air Traffic at Airports in or Near the Southeast  
River Basins Area, Fiscal Year 1959

<u>Airport Location</u>	<u>No. of All-Cargo Airlines Serving</u>	<u>Aircraft Departures</u>	<u>Tons of Airmail</u>	<u>Freight Cargo</u>	
				<u>Tons</u>	<u>% of U. S.</u>
Atlanta, Georgia	2	2,286	128.7	7,439.8	11.85
Jacksonville, Florida	1	30	0	8.8	*
U. S. Totals	--	17,600	1,021.5	62,769.1	100.00

\* Negligible.

Source: Federal Aviation Agency, Air Commerce Traffic Pattern, Fiscal Year 1959.

Table 68

TELEPHONE DEVELOPMENT IN THE U. S. AND SELECTED  
STATES, DECEMBER 31, 1957

<u>Item</u>	<u>U. S.</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>N. C.</u>	<u>S. C.</u>
Estimated Popu- lation (thousands)	171,971	3,186	4,054	3,779	4,515	2,387
Estimated Number of Households (thousands)	49,196	833	1,208	994	1,133	581
Total No. of Telephones	63,620,900	708,600	1,507,500	972,400	947,800	452,300
Business	18,160,700	186,900	517,400	288,000	269,800	128,100
Residential	45,460,200	521,700	990,100	684,400	678,000	324,200
Total No. of Telephone per 1,000 population	370	222	372	257	210	189
No. of Residential Telephones per 1,000 Households*	924	626	820	689	598	558
No. of Business Telephones per 100 Residential Telephones	40	36	52	42	40	40

\*Not the same as "per cent households with telephone service," as estimated by the American Telephone and Telegraph Company. The latter's figures are appreciably lower.

Source: Federal Communications Commission, Statistics of Communications Common Carriers, Year Ended December 31, 1957. Ratios are derived from the FCC data.

Table 69

Distribution of Telephones by Ownership in the U. S.  
and Selected States, December 31, 1957

	Number of Telephones		
	<u>Bell Companies</u>	<u>All Others</u>	<u>Total</u>
U. S. total	53,882,500	9,738,400	63,620,900
Alabama	613,300	95,300	708,600
Florida	1,027,400	480,100	1,507,500
Georgia	841,000	131,400	972,400
North Carolina	522,600	425,200	947,800
South Carolina	340,800	111,500	452,300

Source: Federal Communications Commission, Statistics of Communications Common Carriers, Year Ended December 31, 1957.

Table 70

TELEPHONE DEVELOPMENT, DISTRIBUTION, AND GROWTH IN THE  
U. S. AND SELECTED AREAS 1/, 1950 TO 1958

		U. S. <u>Total</u>	Alabama <u>Area</u>	Florida <u>Area</u>	Georgia <u>Area</u>	N. C. <u>Area</u>	S. C. <u>Area</u>
		(1,000)					
Total no. of tele- phones, 1958 <u>2/</u>		63,631	708,647	1,509,558	971,090	947,819	451,866
<u>Telephone Development</u>							
Per Cent households with telephone service:							
Entire area	1958	75.6	54.9	67.6	59.6	54.7	48.0
	1950	61.4	34.0	40.6	39.7	32.9	28.3
In SMA's <u>3/</u>	1958	81.9	67.7	71.1	72.0	71.6	59.2
	1950	70.9	52.2	49.4	63.8	57.4	44.8
Outside SMA's	1958	64.4	42.9	60.1	48.6	48.3	43.0
	1950	47.4	20.9	26.9	24.6	25.4	22.4
Total telephones <u>4/</u> per 1,000 population:							
Entire area	1958	368	226	362	257	211	191
	1950	274	132	225	160	128	110
In SMA's	1958	430	313	416	352	327	273
	1950	337	213	286	278	248	195
Outside SMA's	1958	267	154	266	183	171	156
	1950	186	78	136	92	94	82
<u>Relative Distribution, 1958</u> <sup>*</sup>							
Per cent of total telephones:							
In SMA's		72.4	62.6	73.6	59.9	39.8	42.1
Outside SMA's		27.6	37.4	26.5	40.1	60.2	57.9
Per cent of total households:							
In SMA's		63.6	48.4	68.5	46.7	27.3	31.0
Outside SMA's		36.4	51.6	31.5	53.3	72.7	69.0
Per cent of households with telephone service:							
In SMA's		69.0	59.6	72.0	56.4	35.8	38.2
Outside SMA's		31.0	40.4	28.0	43.6	64.2	61.8
<u>Growth, 1950-1958 (per cent)</u>							
Total telephones <u>4/</u> :							
Entire area		53.9	75.1	142.6	75.9	82.5	93.7
In SMA's		55.3	69.0	136.9	66.2	69.1	84.3
Outside SMA's		50.5	86.4	160.0	92.7	92.6	101.2
Total no. of households:							
Entire area		17.3	4.5	52.4	10.8	11.3	12.9
In SMA's		25.3	20.7	71.0	34.5	29.0	31.2
Outside SMA's		5.5	-7.2	23.3	-4.0	5.8	6.2
Households with telephones:							
Entire area		44.3	68.5	153.6	66.3	84.8	91.1
In SMA's		44.8	56.4	146.1	51.9	60.9	73.5
Outside SMA's		43.3	90.3	175.3	89.6	101.4	104.0

Table 70  
(continued)

1/ The Alabama "area" and other such areas approximate, but do not conform precisely to, the state political boundaries. Partly for this reason, the figures differ somewhat from statistics of the Federal Communications Commission.

2/ As of January 1.

3/ Standard Metropolitan Areas in Alabama are Birmingham, Gadsden, Mobile, and Montgomery, all of which are outside the study area; Russell County is part of the Columbus, Georgia SMA. Florida's include Jacksonville, Miami, Orlando, Tampa, St. Petersburg and (for 1958 but not for 1950) Pensacola. Georgia's SMA's are Atlanta, Augusta, Columbus, Macon, and Savannah; Walker County is part of the Chattanooga SMA, while Augusta and Columbus include contiguous counties in S. C. and Alabama, respectively. All of Georgia's SMA cities are in the study area, but Pensacola is the only Florida SMA included. All Carolina SMA's (except the S. C. portion of the Augusta SMA) are outside the study area.

4/ Including service telephones.

\*Proportions of totals inside and outside SMA's.

Source: American Telephone and Telegraph Company, Telephone Development and Growth, 1950-1958. December, 1959.



Table 71

TELEPHONE DEVELOPMENT IN THE STUDY AREA, BY STATE SEGMENTS,  
1950, 1955, AND 1959

(Total number of telephones)

Study Area, by State Segments <u>1/</u>	<u>1950</u> <u>2/</u>	<u>1955</u> <u>2/</u>	<u>1959</u> <u>3/</u>
Alabama	37,705*	51,781	79,356*
Florida	53,556	104,438	110,666
Georgia	508,761*	714,682	998,875*
South Carolina	<u>27,946</u>	<u>59,296</u>	<u>71,284</u>
Total	627,968	930,197	1,260,181
<u>Per cent change:</u>	<u>1950-55</u>	<u>1955-59</u>	<u>1950-59</u>
Alabama	37.3	53.3	110.5
Florida	95.0	6.0	106.6
Georgia	40.5	39.8	96.3
South Carolina	112.2	20.2	155.1
Total	48.1	35.5	100.7

1/ Each state segment comprises groups of whole counties which are entirely or mainly within the study area boundaries. The extremely small area in North Carolina is not included.

2/ As of January 1.

3/ Data for Bell territories in Alabama and South Carolina are as of April 30; in Florida and Georgia, as of March 31. Data for non-Bell territories in Alabama and Florida are as of December 31, while those in Georgia and South Carolina are as of January 1, 1959. The Georgia figure appears unduly high.

\* Reported figures for Russell County, Alabama and Muscogee County, Georgia were adjusted so as to allocate the two-county total in accordance with the 1955 proportions, which reflect the interstate division. The 1959 figures above reflect allocation to Alabama of Phenix City exchanges served from Columbus, Georgia. The data do not permit such adjustments for other border areas.

Sources: Southern Bell Telephone and Telegraph Company, for 1950 and 1959 data; U. S. Bureau of the Census, County and City Data Book, for 1955 statistics.

Table 72

Telephone Development of Selected Large Exchange Areas  
in the Study Area and Elsewhere in the U. S., December 31, 1957

<u>Exchange Area</u>	<u>Total Telephones per 1,000 people</u>	<u>Per Cent of Households with Telephone Service</u>
Atlanta, Georgia	416	77
Augusta, Georgia	287	63
Columbus, Georgia	274	59
Macon, Georgia	300	68
Pensacola, Florida	323	70
Savannah, Georgia	338	69
Dallas, Texas	486	83
Houston, Texas	427	77
Jacksonville, Florida	378	74
New Orleans, Louisiana	376	78
Washington, D. C.	700	90
Wilmington, Delaware	538	88

Source: Federal Communications Commission, Statistics of Communications  
Common Carriers, Year Ended December 31, 1957.

Table 73

Radio and Television Broadcast Authorizations in Selected States,  
as of May 1, 1958

<u>Type of Broadcast</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>North Carolina</u>	<u>South Carolina</u>
Radio, A. M.	106	148	124	135	70
Radio, F. M.					
Commercial	15	19	14	38	11
Educational	1	4	1	4	1
Television					
Commercial	11	23	13	17	11
Educational	3	4	2	1	0
Total broadcast authorizations	136	198	154	195	93

Source: Federal Communications Commission, Annual Report for Fiscal Year 1958.

Table 74

TALL TV TOWERS IN THE STUDY AREA<sup>\*</sup>  
(Towers of 1,000 feet or more in height)

<u>Station</u>	<u>Location</u>	<u>Channel</u>	<u>Height in feet</u>
A. Existing towers			
WJBF	Augusta, Georgia	8	1,292
WAGA-TV	Atlanta, Georgia	5	1,100
WSB-TV	Atlanta, Georgia	2	1,076
B. Construction incomplete as of August 15, 1958			
WLWA	Atlanta, Georgia	11	1,042
WGTV	Athens, Georgia	8	1,017

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<sup>\*</sup>As of August 15, 1958, when nationally there were 66 tall towers, construction permits for another 17 were outstanding, and applications for 15 additional tall towers were pending. The tallest antenna in operation stands 1,610 feet high; this is equivalent to the combined height of the Washington Monument and the Empire State Building, and is the world's tallest manmade structure. It is at Roswell, New Mexico, not far from the Texas border.

Source: Federal Communications Commission, Annual Report for Fiscal Year 1958

Table 75

Trends in Public Utility Output, Study Area States  
Compared with the U. S., Selected Years, 1939-1959

	<u>Year</u>	<u>U. S.</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. C.</u>
<u>Utility Operation</u>						
Millions of constant 1957 dollars						
	1959	60,311	588	1,398	927	295
	1939	27,826	249	362	342	119
Index (1939 = 100)	1939	100	100	100	100	100
	1947	139	191	181	159	139
	1954	176	212	244	201	197
	1959	217	236	386	271	248
<u>Electric Power Output</u>						
Millions of KWH						
	1959	794,508	24,740	17,867	12,681	11,297
	1939	130,336	3,943	1,150	1,612	1,568
Index (1939 = 100)	1939	100	100	100	100	100
	1947	236	215	292	245	222
	1954	418	437	870	504	408
	1959	610	627	1,554	787	720

Source: Industrial Development, 1960 Blue Book Edition, May 1960.

Table 76

Capacity of Electric Generating Plants of Public Utilities in the U. S.  
and Selected States, by Source of Energy, 1939, 1940, and 1947 - 1957

Area and Source of Energy	(In Thousands of Kilowatts)												
	1939	1940	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
<u>U. S. Total</u>	38,863	39,927	52,322	56,560	63,100	68,919	75,775	82,226	91,502	102,592	114,472	120,697	129,123
Hydroelectric	11,004	11,224	14,971	15,652	16,654	17,675	18,868	20,419	22,045	23,211	25,004	25,654	27,036
Steam	27,009	27,775	36,035	39,304	44,640	49,333	54,865	59,679	67,235	77,102	87,112	92,591	99,542
Internal Combustion	850	928	1,317	1,604	1,806	1,911	2,041	2,129	2,222	2,279	2,355	2,452	2,545
<u>Alabama, Total</u>	982*	1,005*	1,348	1,394	1,582	1,690	1,822	2,331	2,444	2,934	3,654	3,810	3,810
Hydroelectric	719	743	960	992	1,104	1,212	1,212	1,291	1,291	1,291	1,291	1,291	1,291
Steam	258	256	385	399	475	475	608	1,038	1,150	1,640	(2,362	(2,519	(2,519
Internal Combustion	5	5	4	3	2	2	2	2	2	2	(	(	(
<u>Florida, Total</u>	415	441	666	770	898	999	1,128	1,297	1,546	1,721	2,062	2,297	2,585
Hydroelectric	14	14	13	13	13	13	13	13	13	13	13	13	43
Steam	367	390	606	700	822	922	1,045	1,204	1,446	1,616	2,050	2,284	2,542
Internal Combustion	34	36	47	58	63	64	70	80	87	92			
<u>Georgia, Total</u>	481	486	720	846	882	1,156	1,181	1,317	1,354	1,572	1,675	1,719	1,926
Hydroelectric	338	344	343	343	338	412	432	432	477	476	480	500	586
Steam	142	140	375	499	541	741	746	882	875	1,094	1,195	1,219	1,340
Internal Combustion	2	2	2	4	3	3	3	3	2	2			
<u>S. C., Total</u>	634	656	813	823	824	847	1,067	1,063	1,379	1,573	1,652	1,652	1,658
Hydroelectric	501	516	650	651	651	653	653	651	813	932	932	931	938
Steam	130	138	157	167	167	189	409	409	564	639	721	721	720
Internal Combustion	3	3	5	5	6	6	6	3	2	2			

\* Includes industrial plants' generating capacity.

Source: Federal Power Commission

Table 77

Production of Electric Power by Public Utilities in the U. S. and Selected States,  
by Source of Energy, 1939, 1940, and 1947 - 1957

Area and Source of Energy	(In Millions of KWH)												
	1939	1940	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
<u>U. S., Total</u>	130336	144985	255739	282698	291100	329141	370673	399224	442665	471686	547038	600668	631507
Hydroelectric	44022	47753	78425	82470	89748	95938	99751	105102	105233	107069	112975	122029	130232
Steam	85007	95675	174500	196928	197878	229543	267252	290385	333542	360834	430119	474552	497212
Internal Combustion	1307	1557	2813	3300	3473	3660	3671	3736	3890	3783	3944	4087	4062
<u>Alabama, Total</u>	3943	4923	7322	8289	8707	9577	10253	10975	13987	15805	21348	23817	22200
Hydroelectric	3198	3920	5347	5765	6882	6651	6234	5477	5973	4577	5676	5485	6881
Steam and Internal Combustion	745	1003	1975	2524	1825	2925	4019	5499	8014	11228	15672	18332	15319
<u>Florida, Total</u>	1150	1316	3186	3733	4159	4847	5597	6438	7718	8749	9593	11340	12428
Hydroelectric	32	27	53	59	43	29	32	41	44	30	13	22	190
Steam and Internal Combustion	1118	1290	3133	3674	4116	4818	5565	6397	7674	8719	9580	11318	12239
<u>Georgia, Total</u>	1612	1613	3478	3883	4342	5235	6318	6649	7089	6951	7705	8234	9231
Hydroelectric	1197	1056	1234	1450	1746	1408	1145	1447	1561	1176	1126	1175	1598
Steam and Internal Combustion	415	557	2244	2433	2596	3827	5173	5202	5529	5775	6580	7059	7633
<u>South Carolina, Total</u>	1568	1464	2584	3175	3322	2910	3721	4967	5008	5420	5870	6536	7126
Hydroelectric	1231	997	2019	2553	2975	1873	1479	2044	2110	1889	1511	1669	2599
Steam and Internal Combustion	337	468	564	622	347	1038	2242	2923	2898	3531	4359	4867	4527

Source: Federal Power Commission.

Table 78

Estimated Electric Energy Sales in the Study Area,  
by State Segments, 1939, 1940, and 1947 - 1958

(In Millions of KWH)					
Year	Study Area, Total *	Portion of Study Area in:			
		Alabama	Florida	Georgia	South Carolina
1939	1,901	136	59	1,570	137
1940	2,079	152	66	1,699	161
1947	3,863	268	224	3,107	263
1948	4,538	308	264	3,657	309
1949	4,890	345	300	3,903	342
1950	5,696	408	364	4,535	390
1951	6,512	466	418	5,190	438
1952	7,309	581	540	5,677	511
1953	8,120	630	788	6,144	557
1954	8,946	646	1,080	6,614	605
1955	9,700	720	1,190	7,118	673
1956	10,598	761	1,377	7,733	727
1957	11,373	818	1,516	8,280	760
1958	11,709	884	1,539	8,493	792

\* Components may not add to totals, due to rounding. Excludes the extremely small areas in North Carolina.

Source: Industrial Development Branch estimates, derived from Federal Power Commission data.



Table 79

Estimated Per Capita Electric Energy Sales in the Study Area,  
by State Segments, Compared with the U. S., 1940, 1950, and 1956

	(KWH Per Capita)		
	<u>1940</u>	<u>1950</u>	<u>1956</u>
<u>Portion of Study Area In:</u>			
Alabama	310	845	1,552
Florida	151	677	2,216
Georgia	616	1,491	2,356
South Carolina	719	1,685	2,716
<u>Entire Study Area</u> *	483	1,325	2,270
United States	899	1,855	3,170

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\*Excluding the extremely small areas in North Carolina.

Source: Total sales estimated by Industrial Development Branch from  
Federal Power Commission data; population estimates by John L.  
Fulmer, Georgia Institute of Technology.

Table 80

Gas Utility Industry: Customers and Revenues by Class of Service,  
Relative to Population, in the U. S. and Selected States, 1957

	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>South Carolina</u>	<u>U. S.</u>
<u>Customers per 1,000 Population</u>					
Total	123	48	120	27	179
Residential	114	45	110	24	165
Commercial	9	3	10	3	13
Industrial	(a)	(a)	(a)	(a)	1
Other	(a)	(a)	(a)	(a)	(a)
<u>Revenues (Dollars per Capita)<sup>b</sup></u>					
Total	21.19	5.70	18.30	6.33	24.29
Residential	9.17	2.61	8.49	1.70	13.97
Commercial	1.90	1.19	2.12	.84	2.97
Industrial	10.12	1.66	7.69	3.80	6.75
Other	.32	.24	.27	--	.60

(a) Less than one.

(b) Components may not add to totals, due to rounding.

Source: Statistical Abstract of the U. S.

## Construction

During the period from 1940 to 1958, construction employment in the study area more than doubled and personal income from construction increased at an average annual rate of more than 8 per cent, after adjustment for price changes. This growth has been uneven among parts of the study area, and it has not equaled the pace of the group of four principal states represented, or the much more rapid pace of the State of Florida. Construction employment as a percentage of total employment has grown in Alabama, Florida, and Georgia, but has fallen in South Carolina.

In the context of the entire economy of the study area, construction now accounts for 6 to 7 per cent of the nonfarm jobs and almost 4 per cent of total (farm and nonfarm) personal income. The employment ratio is somewhat higher than the corresponding national ratio (construction employment equals 5.4 per cent of total nonagricultural), and the income ratio is approximately equal to the national average. This set of ratios reflects the somewhat low level of construction wages, and construction costs, in the study area.

### Employment

Of the four states studied, Florida has had the most rapid growth in construction employment, from 25,000 in 1940 to over 107,000 in 1958. More importantly, the rate of increase has not changed appreciably over the 18 years. (See Table 81.) The average yearly percentage increase has been 8 per cent. Most of this large increase is due to the rapid growth of south Florida. However, there are factors present which will tend to slow this growth:

1. The over-supply of homes.
2. The increase in population without an equal increase in employment opportunities.
3. The resulting low wage rates.

Construction employment in Georgia has grown from 23,000 in 1940 to 44,000 in 1958, which is an average increase of 3.5 per cent per year. The growth appears to be leveling out. However, to assume a decrease in the rate of growth is probably incorrect because of two factors:

1. Population projections<sup>1/</sup> show an increase in the rate of population growth in the State.

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<sup>1/</sup> By John L. Fulmer, Georgia Institute of Technology.

2. As residents of the rural sections of the State move to the urban centers, many new homes will be built.

The success or failure of the State's industrialization efforts will play a large part in the future volume of construction employment in the State.

Construction employment in South Carolina has not had the steady growth of that in Georgia and Florida, although it has increased from 14,000 in 1940 to 25,000 in 1958. This is at an average annual rate of 3.2 per cent, which is significantly below the average of Florida or Georgia. Growth since a prior peak in 1948 has been very slight--only 3,000 persons. However, from the trough in 1952 the growth has been rapid.

Construction employment in Alabama has had wide fluctuations since 1950. The increase in the period 1940-1958 has been from 22,000 to 36,000, or at an annual rate of 2.7 per cent which is the lowest of the four states. However, as in the case of South Carolina, the growth in the five years ending with 1958 has been very rapid--second only to Florida.

Insured (or "covered") construction employment in the entire study area has increased from about 26,800 in 1940 to almost 60,000 in 1958. The Florida portion of the study area has lagged behind the remainder of the State in construction employment. In the period from 1949 to 1958, construction employment increased from 4,800 to 9,600 or at an annual rate of 7.3 per cent. This is significantly below the 9.9 per cent increase for the entire State. Also, the growth since 1954 has been very slight as shown on Chart 1.

Construction employment in the Georgia part of the study area has increased from some 33,000 in 1949 to 43,000 in 1958. This is at an annual rate of 2.6 per cent as opposed to a rate of 2.4 per cent for the entire State. The difference of .2 per cent shows that the part of Georgia that is outside the study area is growing at a lesser rate than is the remainder of the State. The increase since 1951 has not only been slight, but is less than the rest of the study area. A comparison of Chart 2 and Chart 5 will illustrate this fact.

Construction employment in the South Carolina portion of the study area increased from nearly 1,000 in 1949 to 2,000 in 1958, which is at an annual rate of 7.8 per cent. However, the increase since 1952-1953 has been small. (See Chart 3.) The annual rate of rise for the State in this period (1948-1958) was 1.6 per cent. The increase from 1950 to 1951 was undoubtedly due to the construction of industrial plants, and in later years the Savannah

River Project helped to foster related construction, although the Project itself was not included in the statistics.<sup>1/</sup>

Construction employment in the Alabama portion of the study area in the period 1949 to 1958 has increased from about 1,700 to 3,000, or at an annual rate of 5.7 per cent. While the growth has not been at a steady rate (see Chart 4), since 1954 the rate has been very high--9.7 per cent, as opposed to the rate of the entire State of 6.1 per cent. Considering that no large cities are in this part of the study area, growth of this magnitude is unusual. However, there is some evidence that the rate of increase is slowing down. Population projections<sup>2/</sup> tend to confirm this view that the Alabama portion in the future will tend to lag behind the Georgia and Florida portions of the study area.

Construction employment in four states of the Southeast<sup>3/</sup> grew at an average annual rate of 5.1 per cent from 1940 to 1958, while that of the study area grew at the rate of 4.0 per cent. From 1949 to 1958 the Southeast's rate was 5.5 per cent while the study area rate was 3.5 per cent. Thus the rate in the Southeast has gradually increased as the rate in the study area has gradually decreased. Column 3 of Table 83 shows a sizeable decrease in the study area as a per cent of the Southeast. The drop-off since 1954 shows the increasing attraction of the cities outside the study area. Column 1 of Table 83 further supports this view, as it shows construction employment in the Southeast growing faster than in the United States. The unevenness of the study area as a per cent of the United States (column 2, Table 83) suggests that large numbers of workers were employed for short periods of time, in public works projects and other new industrial facilities, instead of being used as a steady work force in residential construction.

#### Personal Income from Construction

Table 84 shows that personal income from construction activity has not risen as fast in the study area as a whole as in the four whole states combined. In particular intrastate segments of the study area, different situations prevailed. The Alabama segment's income from construction increased

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<sup>1/</sup> The construction employment of the Savannah River Project is not included, primarily because accurate data are not available.

<sup>2/</sup> By John L. Fulmer, Georgia Institute of Technology.

<sup>3/</sup> Alabama, Florida, Georgia, and South Carolina.

more rapidly than the State of Alabama's. Likewise, the study area portion of South Carolina had a higher rate of gain than the State. By contrast, the rate of increase in the Florida segment was less than in the State of Florida. The Georgia study area and the State of Georgia gained at approximately the same average annual rate.

#### Output Measures

Output values are available by state, but not for intrastate areas. As shown in Table 85, the annual nationwide volume in constant 1957 dollars rose from \$16.6 billions in 1939 to \$22.5 billions in 1947, \$39.6 in 1954, and \$52.4 billions in 1959. Expressed as an index of the 1939 volume, the following data trace the advance:

1939	100
1947	136
1954	238
1959	315

Thus the national index advanced an average of about 11 points annually from the 1939 base during the past two decades.

The corresponding indexes for the principal study area states are as follows:

	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>1959</u>
Alabama	100	105	181	256
Florida	100	185	349	661
Georgia	100	153	246	311
South Carolina	100	170	306	240

Table 81  
CONSTRUCTION EMPLOYMENT<sup>1/</sup> IN THE FOUR PRINCIPAL  
STUDY AREA STATES--1940 AND 1947-1958

<u>Year</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. Carolina</u> <sup>2/</sup>	<u>Four-State Total</u>
1940	21,526	24,824	23,186	13,711	83,247
1947	23,744	40,918	33,996	19,356	118,014
1948	25,451	47,679	37,943	22,183	133,256
1949	26,429	41,931	34,911	21,502	124,773
1950	27,149	48,372	32,116	20,885	128,522
1951	28,614	61,030	41,985	20,789	152,418
1952	35,918	59,978	40,857	19,412	156,165
1953	27,216	65,631	41,881	20,000	154,728
1954	26,482	68,399	42,057	21,000	157,938
1955	29,919	80,515	43,308	23,247	176,989
1956	32,373	89,850	46,140	23,420	191,783
1957	39,205	105,050	44,167	25,154	213,576
1958	35,660	107,616	44,285	25,142	212,703

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<sup>1/</sup> "Covered" (insured) employment, adjusted to the broader basis of coverage adopted in 1956 to include establishments with four or more employees.

<sup>2/</sup> Excluding the Savannah River Project (duPont and the Atomic Energy Commission).

Source: Employment security agencies of the four states.

Table 82  
CONSTRUCTION EMPLOYMENT<sup>1/</sup> IN THE STUDY AREA, BY  
STATE SEGMENTS--1940 AND 1949-1958

<u>Year</u>	<u>Study Area, Total</u>	<u>Portion of Study Area in:</u>			
		<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>S. Carolina</u> <sup>2/</sup>
1940	26,831	1,610	2,492	21,788	941
1949	40,169	1,671	4,752	32,805	941
1950	37,883	1,862	4,041	30,990	990
1951	52,346	2,292	6,944	40,774	2,336
1952	50,346	1,810	6,791	39,809	1,936
1953	54,912	1,897	11,198	40,000	1,817
1954	51,847	1,914	8,496	39,705	1,732
1955	54,506	2,684	8,150	41,940	1,732
1956	57,717	2,521	9,079	44,453	1,664
1957	58,276	3,013	10,604	42,524	2,135
1958	56,983	2,914	9,556	42,521	1,992

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<sup>1/</sup> "Covered" (insured) employment, adjusted to the broader basis of coverage adopted in 1956 to include establishments with four or more employees.

<sup>2/</sup> Excluding the Savannah River Project (duPont and the Atomic Energy Commission).

Source: Employment security agencies of the four states.



Table 83

RELATIVE LEVELS OF CONSTRUCTION EMPLOYMENT<sup>1/</sup> IN THE STUDY AREA,  
SELECTED SOUTHEASTERN STATES, AND THE U. S.--1940 AND 1949-1958

Year	<u>Per Cent of U. S.<sup>2/</sup></u>		<u>Study Area as Per Cent of Four-State Total</u>
	<u>Four-State Total</u> <sup>3/</sup>	<u>Study Area</u>	
1940	6.43	2.07	32.23
1949	5.76	1.86	32.19
1950	5.50	1.20	29.48
1951	5.85	2.09	34.34
1952	5.92	1.91	32.24
1953	5.90	2.09	35.49
1954	6.09	2.00	32.83
1955	6.41	1.98	30.80
1956	6.55	1.97	30.09
1957	7.61	2.08	27.29
1958	8.03	2.15	26.79

<sup>1/</sup> Base figures on construction employment are from the Bureau of Labor Statistics, in the case of U. S. totals, and from state employment security agencies for state and counties. Data from the state agencies are for "covered" (insured) employment, adjusted to the broader basis of coverage adopted in 1956 to include establishments with four or more employees. Since the B. L. S. coverage tends to be broader, the study area and four-state employment figures are somewhat understated relative to the U. S.

<sup>2/</sup> Base figures for study area and four-state area excludes the Savannah River Project in South Carolina (duPont and the Atomic Energy Commission).

<sup>3/</sup> Alabama, Florida, Georgia, and South Carolina.

Sources: U. S. Bureau of Labor Statistics; and employment security agencies of the four states.

Table 84

RATE OF ANNUAL INCREASE IN PERSONAL INCOME FROM  
CONSTRUCTION--1940 to 1958 and 1949 to 1958\*

<u>Area</u>	<u>1940 to 1958</u>	<u>1949 to 1958</u>
Four-state Area, Total	8.8	8.7
State of Alabama	8.2	6.8
State of Florida	10.4	11.4
State of Georgia	7.7	6.0
State of South Carolina	6.2	6.2
Study Area, Total	8.3	7.0
Alabama segment	8.8	9.4
Florida segment	9.2	8.1
Georgia segment	7.7	6.2
South Carolina segment	7.2	12.5

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\* Personal income data by industrial source, for whole states, are from the Office of Business Economics, U. S. Department of Commerce. Estimates for the intrastate areas were derived by solving for "x" in the equation: (Statewide insured wages and salaries in construction) + (Statewide personal income from construction) = (Study area segment's insured wages and salaries in construction) + x. Rates of increase were calculated by dividing the 1958 figure by the base year figure and using compound growth tables.

Source: Employment security agencies of the four states, and U. S. Department of Commerce, Office of Business Economics.

Table 85

CONSTRUCTION OUTPUT VALUES IN THE U. S. AND SELECTED  
STATES--1939, 1947, 1954, and 1959

(In millions of 1957 dollars)

<u>Area</u>	<u>1939</u>	<u>1947</u>	<u>1954</u>	<u>1959</u>
United States	16,603	22,536	39,553	52,374
Alabama	213	223	385	545
Florida	283	524	989	1,871
Georgia	235	359	579	731
South Carolina	164	279	492	393

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Source: Industrial Development, 1960 Blue Book Edition, May 1960.

CHART 1  
ADJUSTED\* CONSTRUCTION EMPLOYMENT IN FLORIDA PORTION  
OF THE STUDY AREA, 1949-1959



CHART 2  
ADJUSTED\* CONSTRUCTION EMPLOYMENT IN GEORGIA PORTION  
OF THE STUDY AREA, 1949-1959

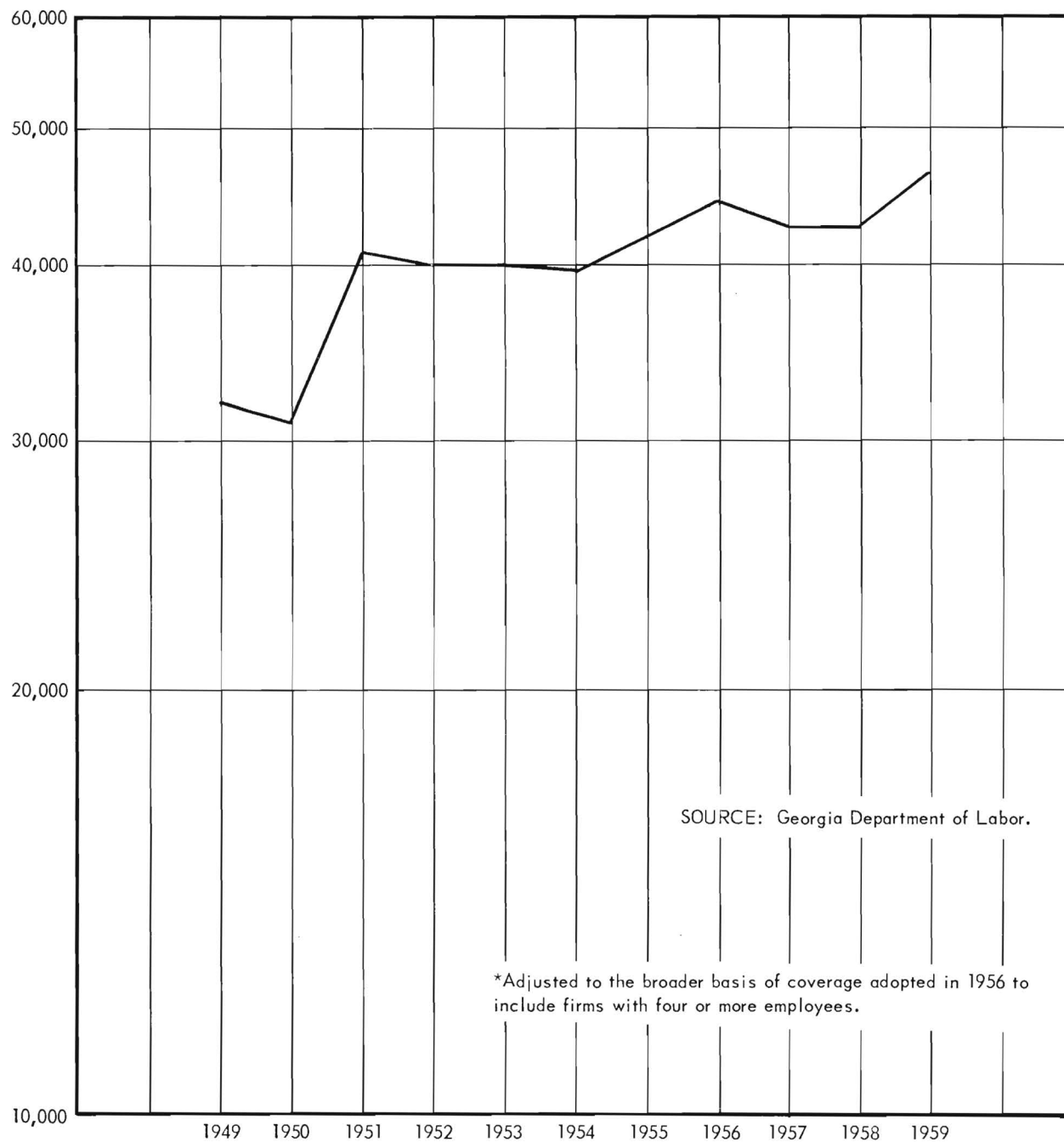


CHART 3  
ADJUSTED\* CONSTRUCTION EMPLOYMENT IN SOUTH CAROLINA PORTION  
OF THE STUDY AREA, 1949-1959<sup>1</sup>

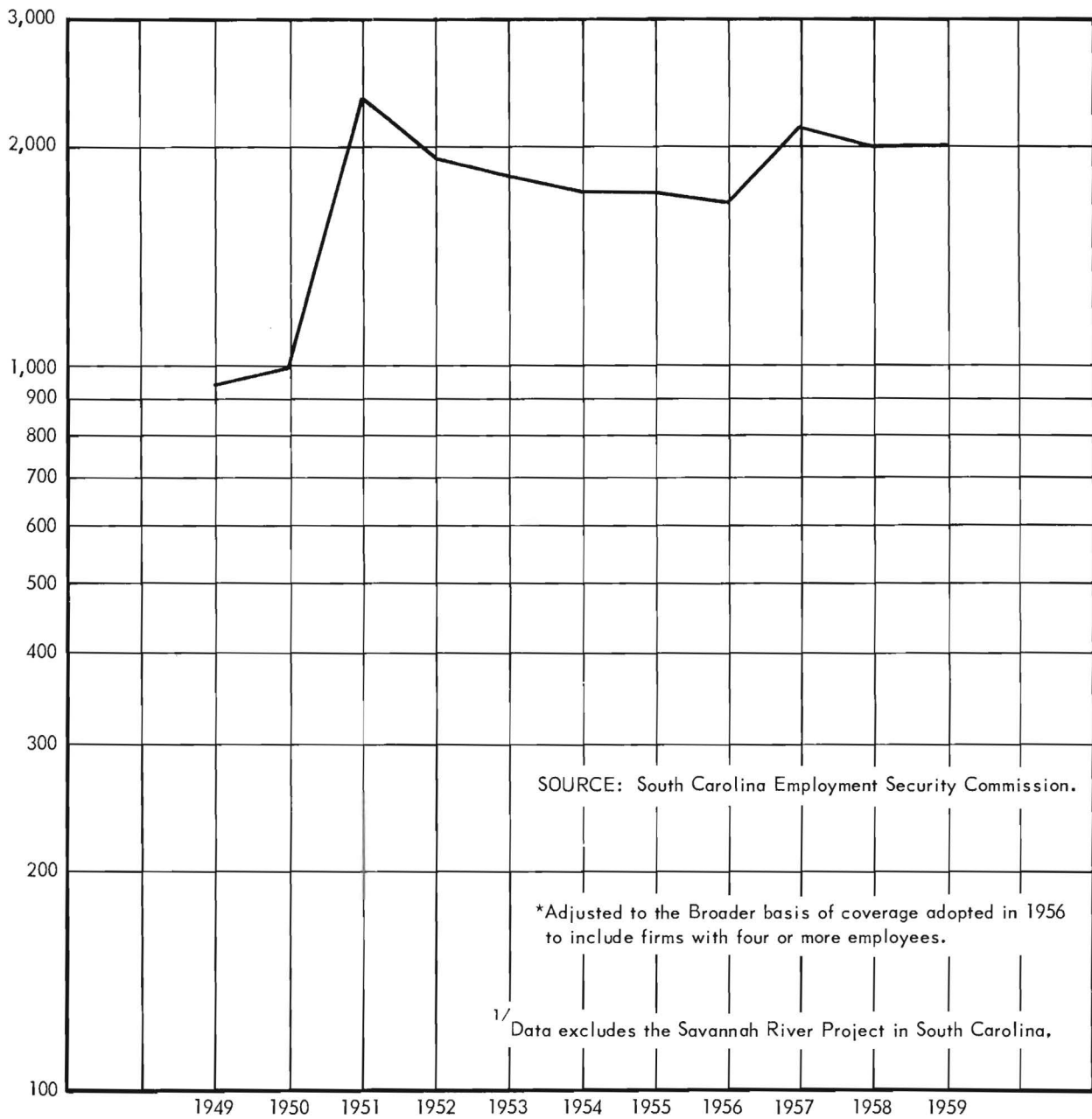


CHART 4  
ADJUSTED\* CONSTRUCTION EMPLOYMENT IN ALABAMA PORTION  
OF THE STUDY AREA, 1949-1959

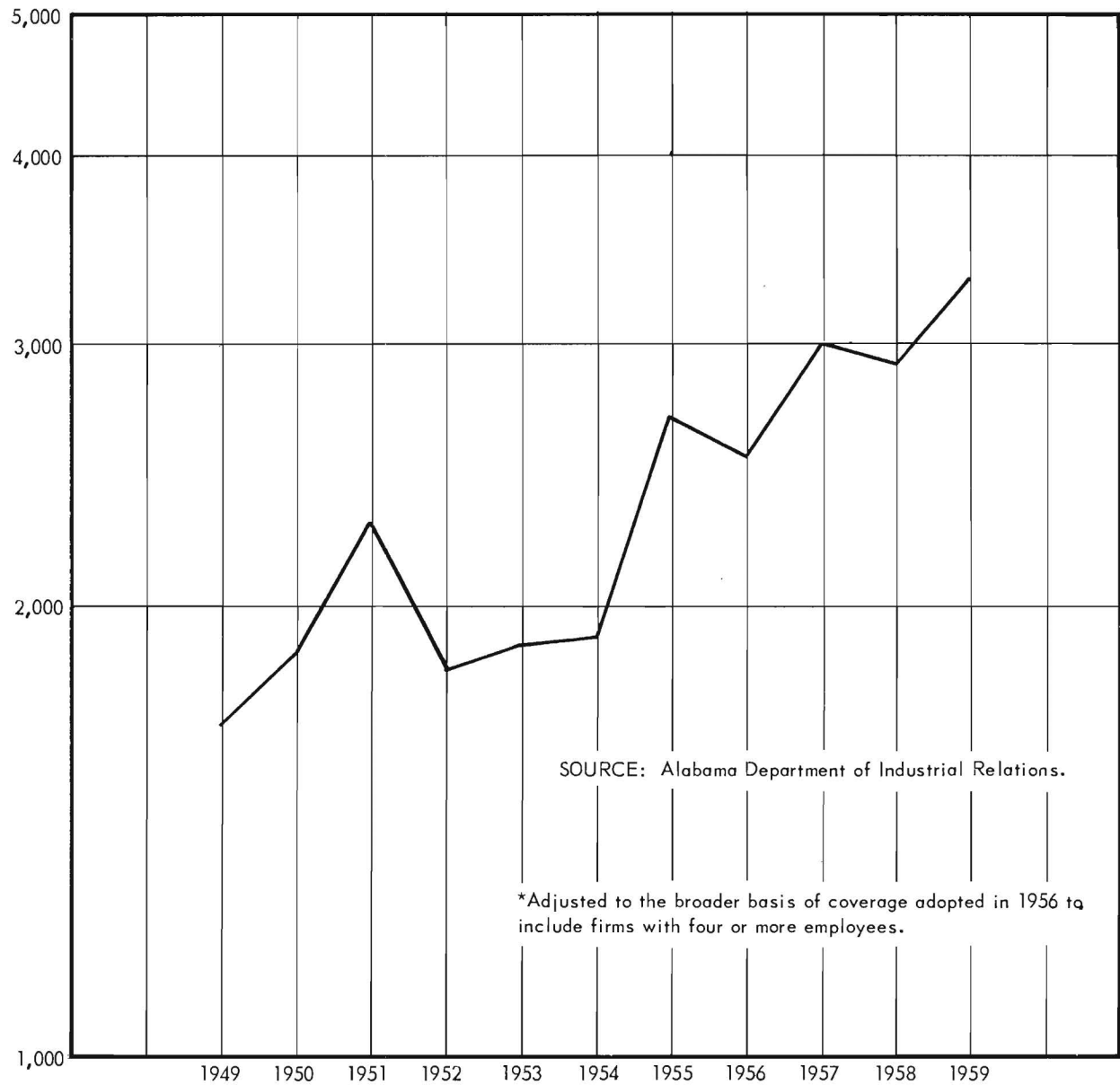
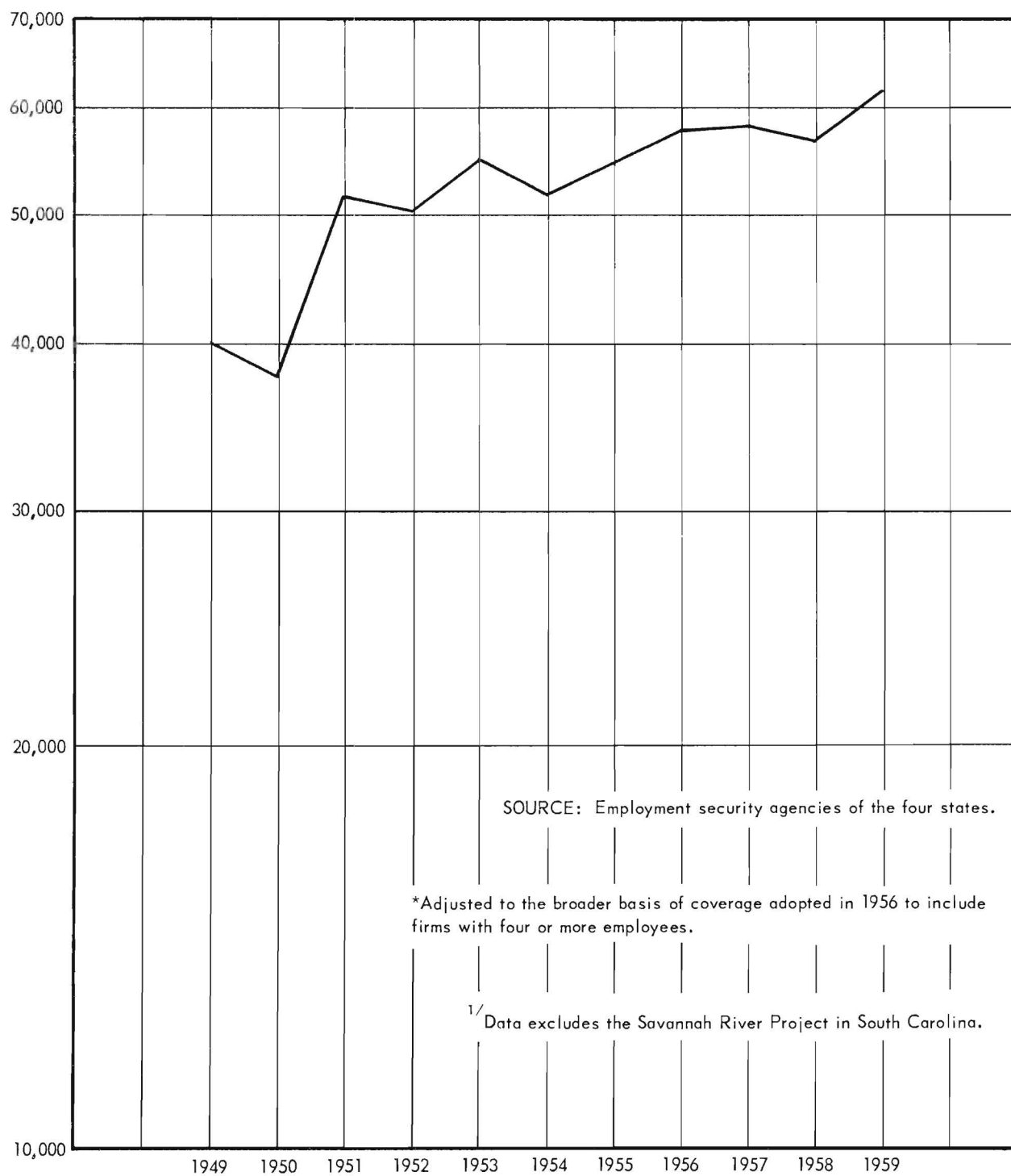


CHART 5  
ADJUSTED\* CONSTRUCTION EMPLOYMENT IN THE STUDY AREA, 1949-1959<sup>1</sup>





INDUSTRIAL RESOURCES AND POTENTIALS  
OF THE SOUTHEAST RIVER BASINS

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Summary of Recent Trends  
in  
Economic Growth and Development

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~~Economic Development Potentials by River Basin~~

Prepared for the administrative use only of the  
United States Study Commission, Southeast River Basins

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Lamar White, Project Director

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Industrial Development Branch  
Engineering Experiment Station  
Georgia Institute of Technology  
July 1960

## INDUSTRIAL RESOURCES AND POTENTIALS OF THE SOUTHEAST RIVER BASINS

### Sections of the Final Report and Their Designations

<u>Title</u>	<u>Section</u>
Land Use Patterns and Planning Activity	A
Mineral Resources Review	B
Water Resources	C
Population and Labor Force	D
Employment	E
Personal Income	F
Disposable Income, Consumption, and Savings	G
Economic Indicators for Major Functional Segments of the Economy	H
Summary of Recent Trends in Economic Growth and Development	I
Economic-Statistical Projections	J
Mathematical-Economic Projections	K
Economic Development Potentials by River Basin	L

## Table of Contents

### Section I

#### Summary of Recent Trends in Economic Growth and Development

	<u>Page</u>
Salient Features	I-1
Population and Labor Force Trends	I-3
Population Growth Rates by States, 1930 - 1950	I-3
Study Area Portions of States, 1930 - 1950	I-3
River Basins and State Sub-basins, 1930 - 1950	I-3
Trends for Population Components	I-4
Natural Increase	I-4
Migration	I-4
Rates of Participation in the Labor Force	I-4
The Labor Force in the Study Area, 1940 to 1950	I-5
Trends in Employment	I-5
Changes in Industrial Structure	I-8
Manufacturing	I-9
Employment	I-9
Trends in Other Measures of Manufacturing Activity	I-10
Composition by Industry	I-11
Nonmanufacturing Industries	I-11
Trade	I-11
Services	I-12
Transportation and Public Utilities	I-12
Construction	I-14
Changes in Personal Income and Its Disposition	I-15
Per Capita Income Trends in the Study Area	I-15
Trends in Total Personal Income	I-16
Trends in Income Composition	I-17
Trends in Disposable Income and Consumption	I-18
Savings and the Investment Multiplier	I-18
Organized Economic Development Efforts	I-19
Types of Organizations	I-19
Main Objectives and Activities	I-20
Trends in the Study Area	I-20

## SUMMARY OF RECENT TRENDS IN ECONOMIC GROWTH AND DEVELOPMENT

### Salient Features

The people in the study area and their neighbors in the Southeast have been achieving better economic balance and, consequently, higher levels of per capita income during the past several decades. As in the country generally, rising productivity and changing technology in agriculture have brought about far-reaching economic and social changes. The shift to fewer and larger farms, employing fewer people on a given area of land, has resulted in migration on a massive scale from rural to urban communities. Many of those remaining depend on nonfarm income principally for their livelihood. (The coming of new factories has converted a number of communities from rural farm to rural nonfarm.) Manufacturing establishments in urban areas often attract commuting workers from rural areas at considerable distances away. However, many workers in the Piedmont portion of South Carolina, for example, have managed successfully to combine farming with a factory job, achieving a balanced economy at the family level.

The growth of manufacturing, trade, and other major nonfarm sectors and the concurrent decline in agriculture as a source of employment has pushed up per capita income levels faster than in the country as a whole. Most of these major nonagricultural industry divisions have provided new jobs more rapidly in the study area than in the nation generally. Rising incomes have led to sharp advances in consumer expenditures and trade, but employment in the service category has not gained as fast as in the nation.

Manufacturing has been attracted to the region for many reasons. Major factors include the area's outstanding forest and water resources,

its ample supply of available and productive labor, and the favorable effects of growth momentum -- manifested in a growing market.

The study area's economic structure has been improved in ways additional to the shift from farm to nonfarm sources of income. The composition of manufacturing itself has improved -- durable goods manufacturing has gained in relative importance as dependence on textiles alone has declined appreciably.

Most counties in the area have suffered relative losses in population during recent decades, and many show absolute declines. Nearly all of the impressive gains have been concentrated in the outlying portions of metropolitan areas.

Increasing industrialization and urbanization have begun to introduce many of the problems already familiar to the more economically mature portions of the country. The need for adequate and timely planning daily becomes more insistent. By and large, it is an unmet need. A good start has been made in the larger cities (those of 10,000 population and over), nearly all of which have active planning commissions and comprehensive programs. But many examples of obviously inadequate or improper planning and zoning abound even in the largest cities of the area. Problems of assuring adequate sites for industry and for achieving optimum land use patterns are likely to become worse before they are resolved.

Positive and promising efforts are being made in the area, by such organizations as the electric power companies and most of the state development agencies, to develop effective planning programs which will quicken and sustain economic development. This goal will become increasingly important in the future as the area becomes industrially mature.

## Population and Labor Force Trends

### Population Growth Rates by States, 1930 - 1950

Two of the five study area states had a growth rate above the national average from 1930 to 1950, as did the five states combined. Of the other three states studied, South Carolina had an increase of 21.8 per cent compared with 22.7 per cent for the nation, while Alabama and Georgia had rises of 15.7 and 18.4 per cent, respectively. North Carolina's increase was 28.1 per cent, and Florida's was a spectacular 88.8 per cent.

### Study Area Portions of States, 1930 - 1950

None of the study area segments grew as rapidly as the respective whole states, except in the case of North Carolina. For example, the portion of Florida lying in the study area increased 42.1 per cent in total population, compared with 88.8 per cent for the State of Florida.

The study area's total population increased only 17.1 per cent from 1930 to 1950, compared with 29.5 per cent for the five states combined. Thus the study area's proportion of the five-state total declined from 30.8 per cent in 1930 to 27.8 in 1950.

The Georgia segment's population in 1950 was some 3,042,000, or 70.7 per cent of the study area total of 4,300,100. Florida's segment had 12.5 per cent, Alabama's 11.2 per cent, South Carolina's 5.4 per cent, and North Carolina's only 0.2 per cent of the study area total.

### River Basins and State Sub-basins, 1930 - 1950

The Apalachicola River Basin ranks as the most populous of the eight major basins in the study area, according to estimates derived from 1950 Census data. It represents some 35 per cent of the total, followed by the Altamaha Basin (over 18 per cent), the Savannah Basin (over 16 per cent), and the Perdido-Escambia Basin (over 13 per cent). These four leading basins

taken together represent well over 80 per cent of the total.

State sub-basins with the most rapid growth rates from 1930 to 1950 include the Florida portions of VIII (85.0 per cent) and IV (35.8 per cent), the North Carolina portion of I (29.4 per cent), the Georgia portion of VII (28.6 per cent), and the Florida part of VI (26.8 per cent).

#### Trends for Population Components

The urban component of the total population has been increasing steadily for the past several decades. The urbanization pace has quickened since 1940. The corresponding decline in rural population has been much sharper for nonwhites than for whites.

#### Natural Increase

The area's rate of natural increase is much higher than the national rate. Crude birth rates, at least in Georgia, have been highest among the rural nonwhites and death rates have been highest among the urban nonwhites.

#### Migration

In the period from 1930 to 1958, net out-migration from Georgia occurred in all but five years. From 1950 to 1958 there was an aggregate drain of 41 per cent of the natural increase, which was less drastic than the 48 per cent drain from 1940 to 1950.

#### Rates of Participation in the Labor Force

The major forces determining the percentage of the population in the labor force are age distribution, sex distribution, and location of residence. Population data show a direct relationship between median age and the percentage of the total population in the labor force. This relationship, though not particularly strong, serves as a measuring device. A relatively low median age for a given area can be attributed to a high rate of natural

increase, a heavy out-migration of workers in the mature age groups, or both. Both factors have operated in the study area states, except Florida, during recent decades.

The proportion of males, 14 years of age and over, in the labor force has been relatively stable and about 79 per cent. The ratio of females in the labor force to female population has been increasing. One factor is the big rise in trade and services employment, which offer many openings to women. Other influences tending to increase female participation in the labor force include urbanization and rising educational levels.

The influence of place of residence on labor force participation is very strong among females. In the nation and in the study area the participation rate is highest by far in urban areas, followed by rural nonfarm and rural farm areas. Among males, the rural farm ratio is highest and rural nonfarm is the lowest. However, much of the rural farm margin is accounted for by unpaid farm family workers.

#### The Labor Force in the Study Area, 1940 to 1950

The study area's total labor force increased by some 128,500 workers (1,516,200 to 1,644,700) from 1940 to 1950. The basins contributing the largest absolute gains were VII (Apalachicola), III (Altamaha), VIII (Perdido-Escambia), and I (Savannah), in the order listed. Basins showing the most rapid percentage gains in the ten-year period were VI (Ochlockonee), VIII, VII, III, and I.

#### Trends in Employment

Total employment in the study area rose from 1,437,700 in 1940 to 1,593,200 in 1950. This increase of 155,500 was accompanied by a drop in unemployment, as it exceeded the rise in the area's labor force during the decade of the '40's.



The largest increments in number of jobs were in the river basins listed below.

River Basin		Gain in Number of Jobs
Apalachicola	(VII)	67,900
Altamaha	(III)	29,100
Perdido-Escambia	(VIII)	25,600
Savannah	(I)	23,100

The combination of these four basins accounted for well over 90 per cent of the total net gain in employment in the study area from 1940 to 1950.

For the five states represented in the study area, total nonagricultural employment (as reported by the Bureau of Labor Statistics) increased more rapidly from 1939 to 1957 than in the country as a whole. The rise was most pronounced in Florida (385,300 to 1,132,700). Georgia's increase was second in magnitude, followed by that of Alabama, North Carolina, and South Carolina in the order listed. No detailed analysis of North Carolina's employment was undertaken. The small bits of four counties included in the study area account for very little nonfarm employment.

In general, the study area portions of states other than Georgia are less populous and less prosperous than those states as a whole. The Georgia portion is representative of the whole state, though somewhat more prosperous.

Statistics and estimates for the study area and its parts indicate that manufacturing, trade, government, and services provide the bulk of non-agricultural employment. Nondurable goods -- chiefly textiles, apparel, food, and pulp and paper -- account for most manufacturing employment. Lumber and wood products and transportation equipment are the leading lines of durable manufactures.

Growth in manufacturing employment has been lagging in the Alabama and Florida portions relative to their state totals, but has been comparatively rapid in the Georgia and South Carolina segments.

Wholesale and retail trade jobs have been increasing faster in the Alabama, Florida, and South Carolina study areas than in the whole states. In Georgia, the growth rate has been slightly higher outside the study area.

Government employment in the study area totaled some 202,900 in 1957. Trends in government employment in the four principal states<sup>1/</sup> represented in the study area show a rate of growth from 1939 to 1957 which is much higher than the national average. The four-state area's 1957 employment was 245 per cent of its 1939 level, as compared with an index of 191 for the nation. Analysis of the individual states' growth rates from 1939 to 1957, and of the "mix" of these states' shares of the estimated total for the study area in 1957, suggests a growth rate in the study area only slightly less than that of the four-state total.

Employment in services has been increasing more rapidly in the study area segments of Alabama, Florida, and South Carolina, and just as fast in the Georgia portion, as in the whole states. This category of nonagricultural employment represented 9.6 per cent of the total for the study area in 1957.

For the transportation and public utilities industry division, the BLS statistics by state indicate steady growth in Florida and Georgia from 1939 to 1957 (though Georgia's peaked in 1956). There was a rise in Alabama from 1939 to 1944, followed by a considerable decline from 1944 to 1956 and a slight upturn in 1957. South Carolina experienced increases from 1939 to 1952, with dips in the 1947-1950 period, and a declining trend since 1952.

Contract construction is strongest in the Florida segment (almost 10 per cent), and weakest in the Alabama (4 per cent) and South Carolina (3 per cent) segments. The trend is distorted by the boom volume of construction in the South Carolina and Florida portions in 1953, when a summit was

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<sup>1/</sup>Alabama, Florida, Georgia, and South Carolina.

reached in those areas. Finance, insurance, and real estate jobs are estimated to have almost tripled from 1939 to 1957, but this division still represents a smaller proportion of the total than in the nation generally. Mining employment in the study area is negligible and, except in Alabama, has not shown sustained growth since 1939. But at least it grew some, during a period when this industry division declined in the country as a whole.

Comparison of the estimates for the study area with the BLS time series for the United States shows that the rates of employment increase from 1939 to 1957 were more favorable in the study area in all industry divisions except construction and services.

#### Changes in Industrial Structure

The area's greatest absolute gains in employment from 1939 to 1957 have been in manufacturing, trade, and government. In terms of compound average annual rates of increase, the outstanding category was finance, insurance, and real estate; other leading categories included trade, construction, and government. The rate of growth for total nonfarm employment was higher in the area during the 18-year period than in the nation.

Manufacturing continued to occupy the foremost position in the area's structure, but its percentage of the nonagricultural total declined from over 35 per cent in 1939 to less than 33 per cent in 1957. Trade maintained the second position among the area's industry divisions, and advanced from slightly over 20 per cent in 1939 to almost 23 per cent in 1957. Government likewise advanced, from about 16.8 to 17.7 per cent. Transportation and public utilities declined from 8.7 to 7.1 per cent of the total, while construction rose from about 5.1 to over 5.6. Finance, insurance, and real estate advanced from 2.6 to 3.8 per cent of the total.

## Manufacturing

Manufacturing activity in the study area has maintained a steady growth during the past two decades. Employment has increased, payrolls are larger, and investment in new plant and equipment is substantial each year. Diversification in manufacturing has led to a considerable rise in value added by manufacture.

### Employment

From 1940 to 1950, manufacturing employment increased at an average annual rate of 3.6 per cent. As a proportion of total employment, it advanced from about 17 per cent in 1940 to almost 22 per cent in 1950. By the latter year manufacturing had become the most important category of employment in the study area, and its proportion of total employment was about the same as in the combined four states of Alabama, Florida, Georgia, and South Carolina.

Female employment in manufacturing (as a percentage of total manufacturing employment) is somewhat higher in the study area than in the country as a whole, according to the Census of Population data for 1940 and 1950, and it increased during the decade. This higher proportion is attributable to the concentration of textile and apparel establishments in the area.

Census of Manufactures data for 1939, 1947, and 1954 indicates gains in manufacturing employment of about 87,000 from 1939 to 1947 and 78,000 from 1947 to 1954 in an area totaling 195 counties in Georgia, Florida, Alabama, and South Carolina. These counties have all or most of their manufacturing establishments located within the boundaries of the gross study area. This employment growth was greater in percentage terms than in the country as a whole, the four-state area, and the other regions compared

(South Atlantic, East North Central, Middle Atlantic, and New England).

#### Trends in Other Measures of Manufacturing Activity

Census of Manufactures data also show impressive increases in number of establishments and in wages and salaries for the 195-county area under study. The number of establishments rose from 3,785 in 1939, to 6,925 in 1954, a gain of almost 83 per cent. Although this increase was not as great as in the four-state area or in the entire South Atlantic region, it was far above the national average (65 per cent) and the rates of increase in the New England, Middle Atlantic, and East North Central regions. Most establishments in 1954 were small; 72 per cent of the study area's establishments employed less than 20 persons each.

The study area's percentage gains in manufacturing payrolls and in value added by manufacture from 1939 to 1954 were also impressive. Its payrolls represented 1.2 per cent of the national total in 1939, 1.5 per cent in 1947, and 1.7 per cent in 1954. Similarly, its proportion of the country's total value added by manufacture rose from 1.3 per cent in 1939 to 1.6 per cent in 1947 and 1.7 per cent in 1954. These solid gains must be qualified in the light of the area's composition of manufacturing by industry. In 1954 they were still principally of the low-wage, low-value-added types. This is apparent from a comparison of the aforementioned percentages with the area's proportions of national manufacturing employment and national number of establishments -- 2.3 and 2.4 per cent, respectively.

The four-state region has increased its share of the national expenditures for new manufacturing plant and equipment from about 4.5 per cent in 1947 to 5.2 per cent in 1954, and 5.5 or 5.6 per cent in recent years (1955-1958). Trends could not be established for the study area because data by county are available thus far only for the year 1954.

## Composition by Industry

The main favorable trend in the study area's manufacturing pattern from 1939 to 1958 has been a decreasing reliance on one of its low-wage industries -- textiles. Textile employment remained the foremost manufacturing category, but in 1958 represented less than 30 per cent of the total, as against about 46 per cent in 1939. Some of the changes in the pattern have been less favorable, or unfavorable. Apparel moved into second place, from 7.8 per cent of total manufacturing employment in 1939 to 12.9 per cent in 1958. Another relatively low-wage industry, food products, advanced from about 8 per cent to almost 12 per cent. A fourth low-paying industry, lumber and wood products other than furniture, represented 10 per cent of the total in 1958, against less than 9.5 per cent in 1939. Chemicals and allied products, generally a high-wage industry, slipped from about 7.6 per cent in 1939 to about 4.3 per cent of the total in 1958. However, the study area's manufacturing base has been significantly broadened by growth in the transportation equipment and paper and allied products industries, which by 1958 constituted 7.4 and over 5.4 per cent, respectively, of the total. To summarize, in 1939 the area depended on four low-wage industries and one high-wage industry for 80 per cent of its manufacturing jobs; by 1958, three high-wage and four low-wage industries made up 81 per cent of the total.

## Nonmanufacturing Industries

### Trade

The area's employment in wholesale and retail trade more than doubled in less than two decades, from 1939 to 1958. During the same period, trade maintained its position as the second most important source of personal

income in the study area states, and its percentage of total wages and salaries advanced. However, trade payrolls in the study area proper did not advance as rapidly as in the four-state area. Urban places (cities of 2,500 or more people) accounted for 79 per cent of total retail sales and almost 86 per cent of retail trade payrolls in the study area in 1958 but, surprisingly, the urban places' percentages of both sales and payrolls declined from 1954 to 1958.

### Services

Despite a gain of over 46,000 jobs in the service categories from 1939 to 1957, the study area is sub-average relative to the national totals both with respect to proportion of nonfarm employment in services and to the growth rate. Moreover, the area's growth rate in this category has not kept pace with that for its nonfarm employment generally. This lag appears throughout the study area, except for the Florida segment. A related lag in growth of the volume of receipts has occurred since 1948, following a relative advance from 1939 to 1948. Service trade payrolls have been increasing as a proportion of the study area's total wages and salaries, however, despite this category's unfavorable trend in terms of employment.

### Transportation and Public Utilities

This industry division shows a distinct relative downtrend in the past two decades as a source of jobs and earnings. This trend is evident both nationally and in the Southeast, but the decline has been more prominent in the four principal states of the study area than in the country as a whole.

Within the industry division, divergent trends have been in evidence. Some components, notably highway freight and warehousing, show improvements over time as a source of personal income. The telephone industry's relative

position has remained fairly stable over the past two decades. But the railroad industry has declined drastically as a source of jobs and earnings. The effect has been worse in the study area than in the country at large, because the railroad industry here was a more important part of the total structure in prewar years.

Motor vehicle registrations and motor-fuel consumption in the principal study area states show increases in recent years that are higher than the national averages. Rates of increase in road mileages have been favorable during the period from 1947 to 1958, except in Georgia. Highway traffic density, as measured by motor-fuel consumption per mile of roads and streets, has been lower over the years than the national average, except in Florida.

Large portions of the study area are served by liquid petroleum products pipelines. Total deliveries, 80 per cent of which consisted of gasoline, have increased almost 50 per cent from 1954 to 1959.

Total waterborne commodity traffic shows a generally rising trend at the study area's three deep-draft ports on the Atlantic, but a decline has occurred in recent years at the three deep-draft ports on the Gulf. On the area's segments of the Gulf and Atlantic Intracoastal Waterways, total traffic has shown impressive gains since 1947 (Atlantic) and 1949 (Gulf). Receipts and shipments, as distinguished from through traffic, has fluctuated considerably from year to year on the various waterway segments. They have generally been of much greater magnitude on the Gulf Waterway, particularly between Panama City and Pensacola.

Telephone development in the study area and in the four main states made great strides during the 50's. Increases in total number of telephones from 1950 to 1959 ranged from about 96 per cent to some 155 per cent in each state segment. The Georgia segment's growth rate remained about the same in 1955-59 as in 1950-55, Alabama's increased during the later period, while the other two segments had more rapid growth from 1950 to 1955.



All of the study area states remained behind the national average in total telephones per 1,000 people and in the percentage of households with service, but between 1950 and 1958 the gap narrowed.

Electric energy capacity and output have been showing a favorable rate of growth in the four main states. By 1957 power production in these states represented over 8 per cent of the national total as compared with 6.35 per cent in 1939. Total energy sales in the study area proper rose from a prewar level of about two billion kilowatt hours to almost 12 billion KWH in 1958. The Georgia portion accounted for some 73 per cent of the 1958 total. Per capita sales of electricity in the study area advanced from 483 KWH in 1940 to 2,270 KWH in 1956, but remained substantially below the national average. Furthermore, the growth rate from 1950 to 1956 did not keep pace with that for the 1940-1950 period.

Natural gas pipelines have been extended to more and more of the area's communities in recent years. One of the most spectacular extensions was that across northwest Florida and thence to the State's major cities. However, the study area states have lagged behind the national average in gas customers per 1,000 population.

### Construction

From 1940 to 1958, construction employment in the study area more than doubled and personal income from construction increased at an average annual rate of more than 8 per cent on a constant dollar basis. This growth has been uneven among particular parts of the area, and has fallen short of the rate achieved by the State of Florida or by the four-state composite. As a percentage of total nonfarm employment, construction employment has risen in each of these states except South Carolina. Growth rates by state segments from 1949 to 1958 have been as shown below (annual average rates of increase), compared with a study area aggregate of 4.0 per cent and 5.5 per cent for the four-state area.

<u>Portion of study area</u>	<u>Per cent</u>
Alabama	5.7
Florida	7.3
Georgia	2.6
South Carolina	7.8

The South Carolina portion's increase since 1952-53 has been small.

Personal income from construction followed a like trend. The rate of increase was not as rapid in the study area as in the four whole states combined.

Trends in output volume, measured from a 1939 base in constant dollars, show that the nationwide index in 1954 was 238; all study area states except Alabama exceeded this. In 1959, Georgia nearly equaled the national index of 315 and Florida far exceeded it with 661; but Alabama and South Carolina were considerably below it.

#### Changes in Personal Income and Its Disposition

The more rapid rise of per capita income in Georgia and the Southeast than in the nation has been due primarily to the faster gain in nonagricultural employment. Not only are hourly wages higher in manufacturing generally than in farm employment, but the composition of manufacturing industries has been shifting favorably, in the direction of higher wage levels. Other factors contributing to absolute and relative gains in per capita income include growth in urbanization, decline in the ratio of Negro population, and a rising educational level.

#### Per Capita Income Trends in the Study Area

Estimates for the eight major river basins and the state sub-basins show that in the total study area per capita income rose from \$512 in 1939 to \$1160 in 1950 and \$1403 in 1956; these data are expressed in constant

(1957) dollars. As a ratio of United States per capita income, this represented a rise from 45.5 per cent in 1939 to 66.5 per cent in 1950 and 68.7 per cent in 1956.

None of the individual basins or state sub-basins equalled or exceeded the national average in any of the three periods. However, the analysis by basin and sub-basin reveals degrees of income deficiency. Among the major basins, the Apalachicola River Basin had the highest income level by far in all years measured. The Ogeechee River Basin was lowest in each year. The absolute rise in 1957 dollars for the basins composite was \$891 from 1939 to 1956. Sub-basins exceeding this average were the Florida part of Basin VI, the Florida portion of Basin VIII, and the Georgia portion of Basin VII. The smallest gains were in the Florida part of Basin V, the Alabama portion of Basin VII, the Georgia part of Basin VI, and the tiny North Carolina segment of Basin I.

It is noteworthy that the constant dollar gap widened between the leading and the lowest sub-basin, from \$522 in 1939 to \$1084 in 1956.

#### Trends in Total Personal Income

A comparison of total personal income in the five study area states with that in the nation from 1948 to 1957 shows a significant rising ratio only in Florida. Its percentage of the national total increased from 1.47 per cent in 1948 to 2.22 per cent in 1957. Georgia's ratio rose from 1.49 to 1.60 in 1955, then slipped to 1.56 in 1957. The ratio trend in the other states was unfavorable, though reasonably stable.

The total income in the study area proper, measured in constant 1957 dollars, increased 229 per cent from 1939 to 1956. The Apalachicola Basin, which accounted for over 44 per cent of the area's income in 1956, had an increase of 237 per cent. Other basins representing appreciable shares of the study area total are Basin I, where total income rose from \$323.2 million

to \$1,038.6 million in the 17-year period; Basin III, from \$314.8 million to \$902.9 million; and Basin VIII, from \$175.7 to \$843.7 million. The entire study area's income increased from \$1,989.1 million in 1939 to \$6,548.2 million in 1956.

#### Trends in IncomeComposition

Wages and salaries, the leading component of total personal income, have risen steadily in the last 30 years, both nationally and in states of the study area. Nonfarm proprietors' income has declined moderately as a percentage of the total, and property income has fallen off more sharply, except in South Carolina where the decline has been small. The severest relative declines have occurred in farm proprietors' income, particularly in Alabama, Georgia, and South Carolina; this component has been relatively low in Florida for the past several decades. Moderate relative gains have been made in all four states by other labor income. Transfer payments have increased substantially and are now more important than farm proprietors' income in each of the four states.

Agricultural income -- the sum of farm wages and farm proprietors' income -- has shown an irregular tendency toward relative decline over the years. In the country as a whole, this category rose as a percentage of total personal income from 1940 to 1945, remained stable until 1948, and has since declined sharply. States of the study area have experienced a similar trend.

In the study area proper, wages and salaries have been consistently gaining in relative importance. Estimates indicate that this component rose from some 57 per cent of total personal income in 1940 to 59 per cent in 1950 and about 65 per cent in 1960. Conversely, relative losses occurred in agricultural income, property income, and nonfarm proprietors' income.

The remaining portion of total personal income, consisting of transfer payments and other labor income, rose sharply from 1940 to 1950, then declined slightly from 1950 to 1960.

#### Trends in Disposable Income and Consumption

Disposable income and consumption are increasing at a faster rate in the study area than in the country as a whole. Estimated consumer buying power in the area relative to that in the nation increased from 1948 to 1958, for example, but in the terminal year still represented only about 80 per cent of the national per capita average. Although consumption expenditures represent a larger proportion of disposable income in the area than throughout the country, retail per capita sales as late as 1958 still represented only about 81 per cent of the national average. Nevertheless, they had risen from 69 per cent in 1948. By intrastate segment in 1958, they were 57 per cent in Alabama, 64 per cent in South Carolina, 85 per cent in Georgia, and 86 per cent in Florida. Rates of annual increase in consumption expenditures have been larger in the four-state area than in the study area proper.

The study area's consumption pattern is characterized by a relatively high proportion of consumer goods purchases. Services make up a much higher proportion of the total in the United States generally than in the study area.

#### Savings and the Investment Multiplier

Conversely, the ratio of total savings to disposable income is relatively low in the study area. Nevertheless, monetary savings of individuals in the study area are increasing more rapidly than in the country as a whole. The investment multiplier -- the tendency of investment to effect increases of income greater than the amount of the investment -- is held to be greater in the area than in the country generally because

the ratio of consumption to disposable income is higher here.

### Organized Economic Development Efforts

Development programs involving formal efforts, apart from conventional lines of activity, to encourage economic growth in specific areas have grown remarkably in recent years. They have grown in number, their activities have widened, and by no later than 1957 their total expenditures nationally were estimated to be well above \$200 million annually. As of 1958, a total of 955 organizations, public and private, were reported as concerned with such programs throughout the country; well over half of these were formed since 1950.<sup>2/</sup>

### Types of Organizations

Over 87 per cent of the total number of reporting organizations are privately financed. Their reported expenditures in 1957 represented over half of the reported total. Some 450 of these organizations have been created since 1950. The private organizations include railroads; electric and gas utility companies; banks; local and state chambers of commerce; development credit corporations; various local, state, and regional development groups or development councils; and air, highway and water carriers. Some of these categories, notably the railroads, established their programs in the period before 1945.

The publicly financed organizations reporting numbered only 122, or a little over 12 per cent of the total. No less than 80 of these have been established since 1950. This group comprises state planning and development agencies, port authorities, municipal and county development agencies,

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<sup>2/</sup>Committee for Economic Development, Supplementary Paper No. 10, Developing the "Little" Economies. New York, 1960.

and state industrial financing authorities.

### Main Objectives and Activities

The main objective of the organizations, public and private alike, is the promotion of industrial development; almost 60 per cent of total reported expenditures in 1957 were devoted to this goal. Other prominent objectives include tourist trade development (18 per cent of total reported expenditures) and, particularly among the public organizations, urban renewal (9 per cent of the total and 23 per cent of public organizations' expenditures).

The chief reported types of activities were promotion (both public and private organizations); real estate acquisition and improvement (private only); planning and zoning, and plant financing (public only); and loans (private only).

### Trends in the Study Area

Among the several main types of privately financed organizations, virtually all major public utilities and railroads serving the study area have established formal development programs, as have many of the larger banks. Each state chamber of commerce and many of the local chambers have augmented their programs and increased the emphasis on industrial development efforts. The communities most in earnest about upgrading their economies have made strong efforts to attract and hold capable professionals to head their programs. Some have succeeded. Here and there is the deplorable situation of a city that obtains an excellent man, only to risk losing him when its most influential business leaders create roadblocks to development.

Each state represented in the study area has a planning and development agency. Alabama's Planning and Industrial Development Board was established

in 1955. It has a board type of organization, with a total of 13 members. The governor appoints one member from each of the State's nine congressional districts; other members include the commissioner of agriculture and industries, the commissioner of revenue, the state highway director, and the director of state docks. The appointive members hold office during the governor's tenure of office; the others are members by virtue of their office. The governor serves as the Board's chairman and appoints its vice-chairman. The Board's director, presumably selected by the governor, heads its paid staff. Within recent years the Board has received a federal grant for city planning functions to supplement its appropriations.

The Florida Development Commission was established in 1955. Each of its nine commissioners is appointed by the governor, normally for a term of four years. In the filling of vacancies, appointments are for the unexpired term. Its chairman (and ranking officer) is one of the nine appointed commissioners. Recent appropriations have been some \$2.2 million for a two-year period. The Commission's paid staff is headed by an executive director appointed by the commissioners with the approval of the governor.

The Georgia Department of Commerce was established in 1949. It is organized as a board of five commissioners, each of whom is appointed by the governor for a four-year term, and one of whom is named by the governor as chairman. The staff is headed by a director appointed by the governor, but the staff members themselves are appointed by the board of commissioners. Appropriations normally are supplemented by a sum specifically earmarked for advertising; the advertising fund is provided for jointly by the State and by Georgia industrial corporations.

The South Carolina State Development Board was established in 1945. It is organized as a board of five members, each appointed for a five-year



term by the governor with the advice and consent of the South Carolina Senate. Its ranking officer, the chairman, is selected by the Board itself. A director, also apparently selected by the Board, appoints members of the paid staff, with the approval of the Board. Recent appropriations have authorized specific sums for industrial and tourist advertising.

Port authorities have been established in Alabama, Georgia, and the Carolinas. Proposals to create a statewide port authority in Florida have been under consideration in recent years. Alabama's port authority was one of the earlier ones established, and its development program over the years has been of much larger magnitude than those in other states of the study area. However, South Carolina is now approaching the completion of a \$21 million expansion program at its ports, and Georgia's ports program has been receiving increasing financial support in recent years.

Development efforts at intrastate area levels have tended to be sporadic and somewhat vague more often than sustained and effective. It should also be pointed out that some of the local chambers of commerce and special development groups are functioning as well organized and effective development agencies. All too often, however, money is wasted in advertising and promoting the advantages, real or imagined, of one small county. Vigorous efforts are being made, for example by the Georgia Power Company, to establish and maintain effective planning and development programs among groups of neighboring counties having many common interests but limited funds available.

INDUSTRIAL RESOURCES AND POTENTIALS  
OF THE SOUTHEAST RIVER BASINS

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Economic - Statistical Projections

by

John L. Fulmer

Prepared for the administrative use only of the  
United States Study Commission, Southeast River Basins

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Lamar White, Project Director

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Industrial Development Branch  
Engineering Experiment Station  
Georgia Institute of Technology  
August 1960

## Table of Contents

### Section J

#### ECONOMIC-STATISTICAL PROJECTIONS

	<u>Page</u>
Population	J-1
Basic Population Characteristics	J-1
Trends in Population Components	J-1
High Fertility Rate	J-3
Differential Fertility Rates by Population Components	J-3
Trend in Migration Loss	J-6
Full Employment Policy of Federal Government	J-7
Population Projections	J-8
Alternative Projections for Georgia	J-8
Projections for Basin Areas	J-10
Projections of Components of Population Change	J-13
Population Projections for Eight Major Cities	J-20
Labor Force and Employment	J-23
Factors Influencing the Participation in the Labor Force	J-23
Factors Influencing Unemployment	J-31
Projections of Employment	J-33
Projections of Major Categories of Employment	J-38
Personal Income	J-42
Per Capita Income	J-44
Assumptions Relative to the Factors Affecting Economic Development in Georgia	J-50
Methodology in Projecting Per Capita Incomes of the Southeast River Basins	J-52
Per Capita and Total Personal Income Projections	J-54
Projections of Components of Income, 1960, 1975, 2000	J-60
Concepts of Components	J-60
Basic Assumptions	J-61
Summary of Findings	J-69
Summary and Conclusions, Economic-Statistical Projections	J-79

# INDUSTRIAL RESOURCES AND POTENTIALS OF THE SOUTHEAST RIVER BASINS

## Sections of the Final Report and Their Designations

<u>Title</u>	<u>Section</u>
Land Use Patterns and Planning Activity	A
Mineral Resources Review	B
Water Resources	C
Population and Labor Force	D
Employment	E
Personal Income	F
Disposable Income, Consumption, and Savings	G
Economic Indicators for Major Functional Segments of the Economy	H
Summary of Recent Trends in Economic Growth and Development	I
Economic-Statistical Projections	J
Mathematical-Economic Projections	K
Economic Development Potentials by River Basin	L

<u>Tables</u>	<u>Page</u>
1. Relationship of Crude Birth and Death Rates, and Natural Rates of Increase to Location and Race, for 1940, 1955, and 1957	J-4
2. Georgia's Population by Census Decades from 1930 to 1950, with Projections for 1960, 1975, and 2000 by Four Methods	J-10
3. Population Trends by River Basin and Sub-basin, 1930, 1940, 1950, with Projections: 1960, 1975, 2000	J-12
4. Urban Population Trends by River Basins and Sub-basins for 1930, 1940, 1950, with Projections to 1960, 1975, 2000	J-17
5. Rural Nonfarm Population Trends by Basins and Sub-basins for 1930, 1940, 1950, with Projections to 1960, 1975, 2000	J-18
6. Rural Farm Population Trends by River Basins and Sub-basins for 1930, 1940, 1950, with Projections to 1960, 1975, 2000	J-19
7. Trend in Population from 1900 to 1960 for Selected Growth City Areas in the Southeast River Basins, with Projections for 1975 and 2000	J-21
8. Relation of Median Age to the Percentage of the Population in the Labor Force, 1950	J-23
9. Relation of Location of Residence to Participation of Males and Females in the Labor Force, 1950	J-26
10. Trends in Labor Force by River Basins and Sub-basins for 1940 and 1950, with Projections to 1960, 1975, 2000	J-30
11. Trends in Unemployment by River Basins and Sub-basins for 1940 and 1950, with Projections to 1960, 1975, 2000	J-35
12. Trends in Employment by River Basins and Sub-basins for 1940 and 1950, with Projections to 1960, 1975, 2000	J-36
13. Ratio of Employment to Total Population by River Basins and Sub-basins for 1940 and 1950, with Projections to 1960, 1975, and 2000	J-37
14. Trends in Major Categories of Employment for State Segments of the Study Area for 1940 and 1950, with Projections to 1960, 1975, and 2000	J-40
15. Trend in Per Capita Income of Study Area States Relative to the U.S., 1948-1957, with Projections to 1960, 1975, and 2000	J-47
16. Trends in Specified Factors from 1940 to 1950, Having a Bearing on the Rise in Per Capita Income	J-49
17. Per Capita Income Trends by River Basin and Sub-basin, 1939, 1950, 1956, with Projections for 1960, 1975, 2000	J-58
18. Income Trends by River Basin and Sub-basin Areas, 1939, 1950, 1956, with Projections for 1960, 1975, 2000	J-59
19. Estimated Components of Personal Income by Basins and Sub-	J-70
20. basins of the Study Area, 1960; 1975; 2000	J-71
21.	J-72

<u>Tables (Continued)</u>	<u>Page</u>
22. Trends in Components of Personal Income for Total Study Area, 1960 to 2000	J-73
23. Trends in Ratios of Income Components for Study Area, 1940 to 2000	J-75
24. Trends in Ratio of Income Components for Selected Basins, 1960, 1975, and 2000	J-77

### Charts

I Trends in Ratios of Four Population Components in Georgia, by Census Decades from 1910 to 1950, with Projections to 2000	J-2
II Comparison of Crude Birth and Death Rates, and Natural Increase for the U.S. and Georgia, by Decades 1910-1958	J-5
III Trend in Population Migration from Georgia, 1950-1958, with Projections to 2000	J-6
IV Trends in Total Population in Georgia, 1910-1950, with Projections to 2000 by Four Methods	J-9
V Trend in River Basin and Sub-basin Population Ratios in Georgia, 1930, 1940, 1950, with Projections to 1960, 1975, and 2000	J-14
VI Trend in River Sub-basin Ratios for Alabama, Florida, North Carolina, and South Carolina, 1930, 1940, and 1950, with Projections to 1960, 1975, and 2000	J-15
VII Relationship of the Percentage of Population Urban and Rural Farm to the Percentage of Total Population in the Labor Force, 1950	J-29
VIII Relationship of the Percentage of Population Urban and Rural Farm to the Percentage of Total Population Unemployed, 1950	J-34
IX Trend in Ratio of Georgia Per Capita Income to U.S. Per Capita Income, 1929 to 1958, with Projections of Ratios by Two Methods to 1960, 1975, and 2000	J-45
X Trend in Georgia River Basin and Sub-basin Per Capita Income Ratios to Georgia Per Capita Income, 1939, 1950, 1956, with Projections to 1960, 1975, 2000	J-55
XI Trends in Alabama, Florida, South Carolina, and North Carolina River Basin and Sub-basin Per Capita Income Ratios to Georgia Per Capita, 1939, 1950, 1956, with Projections to 1960, 1975, 2000	J-56

## Preface

The projections developed for population, employment, and income represent a composite of analytical procedures of the approximate movement of these aggregates of the study area's economy to 1975 and 2000. The results are not estimates with calculable probability ratios of the preciseness of the usual statistical estimates. They represent rather the path which statistical analysis of the data and economic relationships, tested against economic models, indicate will describe the change of these aggregates from the present to the two time leaps into the future. The path of movement is conceived of as broadly developed in that the projections are expected to come within its range, perhaps at the upper limit or the lower, depending upon the normality of the forces operating in the aggregates or how far the assumptions prove realistic.

Underlying the projections are basic extrapolations of historical growth rates, employing the most adaptable mathematical curves or lines. But the values finally accepted are not rigidly derived from such lines. They rather serve as benchmarks from which adjustments are made consistent with the equilibrium of economic forces and considering also the growth potentials.

The projections as given may appear optimistic in the light of recent growth rates. There are two reasons for this. In the first place, the study area states are close to a transformation from a semi-urban, and fading sub-dominant rural, type of economy to an urban type of economy, liberal, and fast-moving. The time cycles of economic processes are bound to speed up. In the second place, the projections are set at a level which can be reasonably achieved if we begin now to plan for the skilled personnel, business leaders, transportation and communication, development of the resources that will be required such as forests and water, and all the other elements of an aggressive development program. The projections may, therefore, be regarded as goals, reasonably achievable, provided we begin now to work and plan, with serious intent to accomplish them. A relaxed, self-satisfied view without overall planning and adequate investments in the future would undoubtedly lead to a rate of growth little or no better than occurred during the last two or three decades.

## ECONOMIC-STATISTICAL PROJECTIONS\*

### Population

#### Basic Population Characteristics

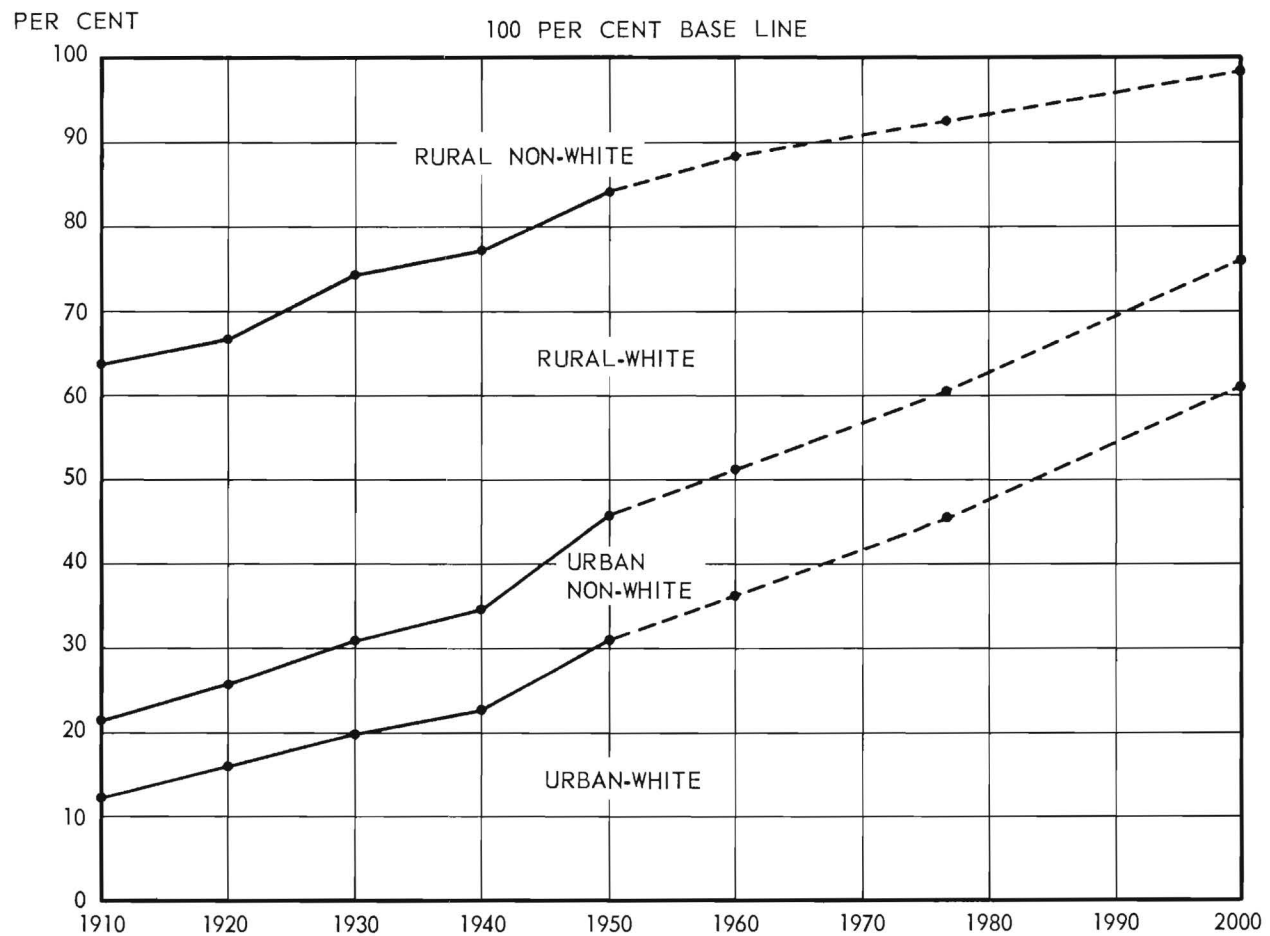
Trends in Population Components. Basic to understanding Georgia's population and making projections of growth for decades in the future are the trends in population composition in Georgia. From 1910, which is as far back as data on population components are available, the relative importance of the rural farm population has been declining; the urban population has been increasing in importance, as it has also grown in numbers. The nonwhite population ratio has been declining, although there are diverse trends within this component. The nonwhite population living in rural areas has been declining rapidly both as a percentage of the total population and also in absolute numbers. On the other hand, the nonwhite population living in urban centers has increased. Although the number of nonwhites living in urban centers has expanded over the years, and also in ratio to the State's total, growth has been just sufficient to offset the decline in rural numbers. Projection of trends from 1910 to 1950, to 2000, show that the ratio of nonwhites in Georgia's population will be down to 16 per cent, about 2 percentage points being in rural areas. The relative loss in position of nonwhites is thus close to 50 per cent. This change in Georgia's population composition will be the main factor in future fertility rates in Georgia, and hence will play an important part in the State's population. See Chart I.

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\* By John L. Fulmer, Georgia Institute of Technology.



CHART I  
TRENDS IN RATIOS OF FOUR POPULATION COMPONENTS IN GEORGIA, BY CENSUS  
DECADES FROM 1910 TO 1950 WITH PROJECTIONS TO 2000



High Fertility Rate. Compared with rates in the nation as a whole, crude birth rates (number per 1000 population) are about 10 per cent higher in Georgia; death rates are about 12 per cent lower; and the natural rate of increase is about 30 per cent above the U. S. overall. See Chart II. Although during the depression decades Georgia's crude birth rates and natural increase retained at least the margin of recent years, the percentage differentials were even higher. The death rate has declined more rapidly since 1930 for Georgia than for the United States. It is probable that as the South becomes more urbanized the death rate may move back in line with the national rate.

Differential Fertility Rates by Population Components. The tabulation given in Table I shows crude birth and death rates and natural increase for Georgia from 1940 to 1958. A close study of the data in relation to Chart II, referred to above, gives the key to Georgia's higher birth rates. They are associated with the nonwhite population of Georgia which has birth rates from 20 per cent higher, in the case of the urban nonwhite population, to 60 per cent higher for the rural nonwhites. The white rates for Georgia, both urban and rural, compare very closely with the national rates. In fact the rural birth rates are slightly lower. This is contrary to the general opinion as to the level of birth rates in the rural South. The comparatively low rates among rural whites, on the other hand, are due to migration losses of young adults.

Death rates are, on the average 10 per cent lower in Georgia. Nonwhites are above the national average, with death rates among the nonwhite population in urban areas being substantially higher than for the national rate. Death rates of whites both in urban and rural areas are significantly lower than the national average, with rural whites being the lowest.

TABLE 1

Relationship of Crude Birth and Death Rates, and Natural Rates of Increase to Location and Race, for 1940, 1950, 1955, and 1957

Class and Year	Urban			Rural			Total
	White	Non- White	Both	White	Non- White	Both	
<u>Births:</u>							
1940	24.3	28.4	25.8	21.8	32.6	25.5	25.6
1950	25.9	31.6	27.3	23.8	38.8	28.3	28.6
1955	26.3	32.4	28.3	24.9	39.1	29.0	28.6
1957	24.4	32.5	26.9	25.1	35.8	27.9	27.5
Avg: (1	25.5	30.8	27.1	23.5	36.8	27.6	27.6
" (2	26.1	32.0	27.8	24.3	38.9	28.6	28.6
<u>Deaths:</u>							
1940	10.5	19.1	13.6	7.5	11.2	8.8	10.3
1950	7.4	12.9	9.0	7.2	10.2	8.1	8.8
1955	8.1	11.9	9.3	7.1	9.6	7.8	8.5
1957	8.5	12.6	9.8	7.3	10.0	8.0	9.0
Avg: (1	8.7	14.6	10.6	7.3	10.3	8.2	9.2
" (2	7.8	12.4	9.1	7.2	9.9	7.9	8.6
<u>Natural Increase:</u>							
1940	13.8	9.3	12.2	14.3	21.4	16.7	15.3
1950	18.5	18.7	18.3	16.6	27.6	20.2	19.8
1955	18.2	20.5	19.0	17.8	29.5	21.2	20.1
1957	15.9	19.9	17.1	17.8	25.8	19.9	18.5
Avg: (1	16.8	16.2	16.5	16.2	26.2	19.4	18.4
" (2	18.4	19.6	18.6	17.2	28.5	20.7	19.9

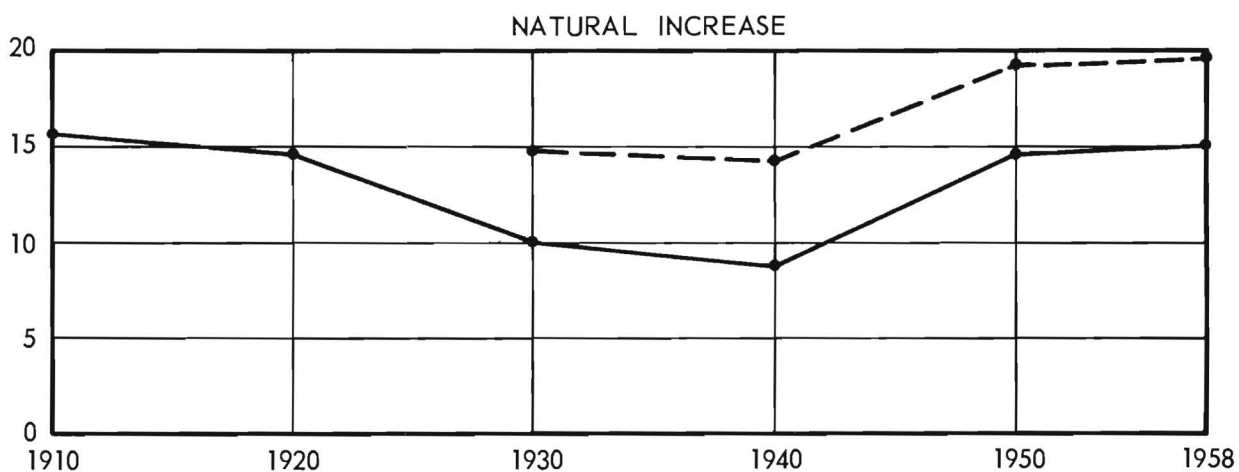
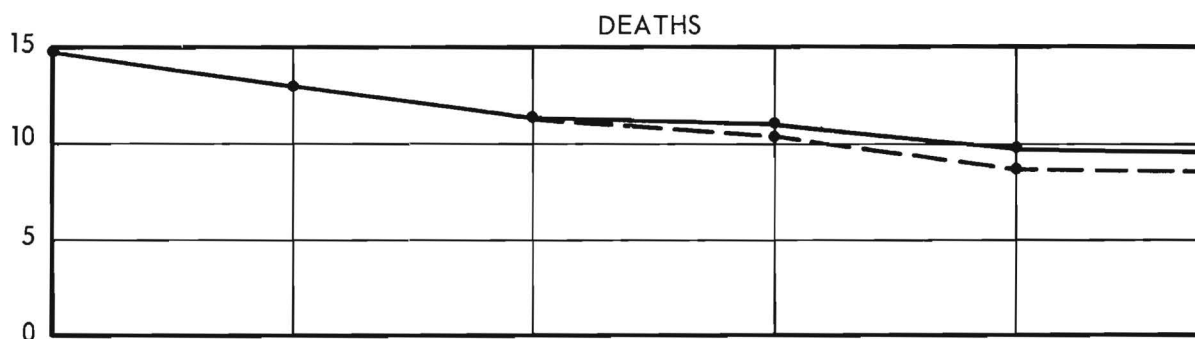
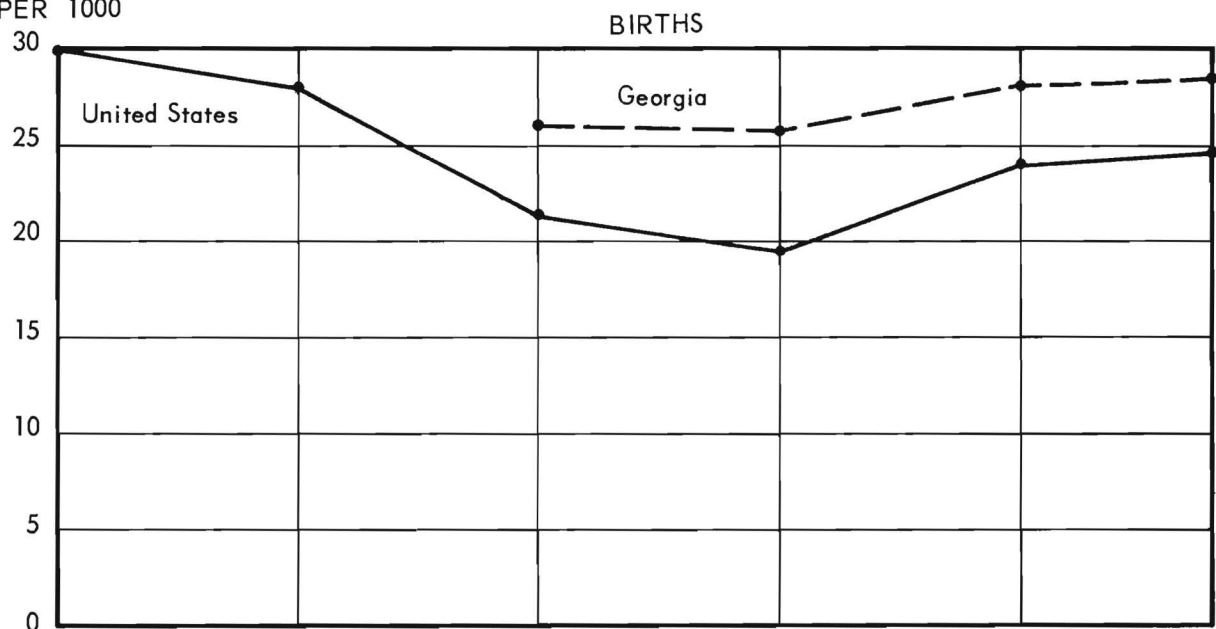
(1. Average of 1940, 1950, and 1955

(2. Average of 1950 and 1955

Source: Vital Statistics of the United States, Department of Health, Education and Welfare (Public Health Service, National Office of Vital Statistics.

CHART II  
COMPARISON OF CRUDE BIRTH AND DEATH RATES, AND NATURAL INCREASE FOR THE  
UNITED STATES AND GEORGIA, BY DECADES 1910-1958

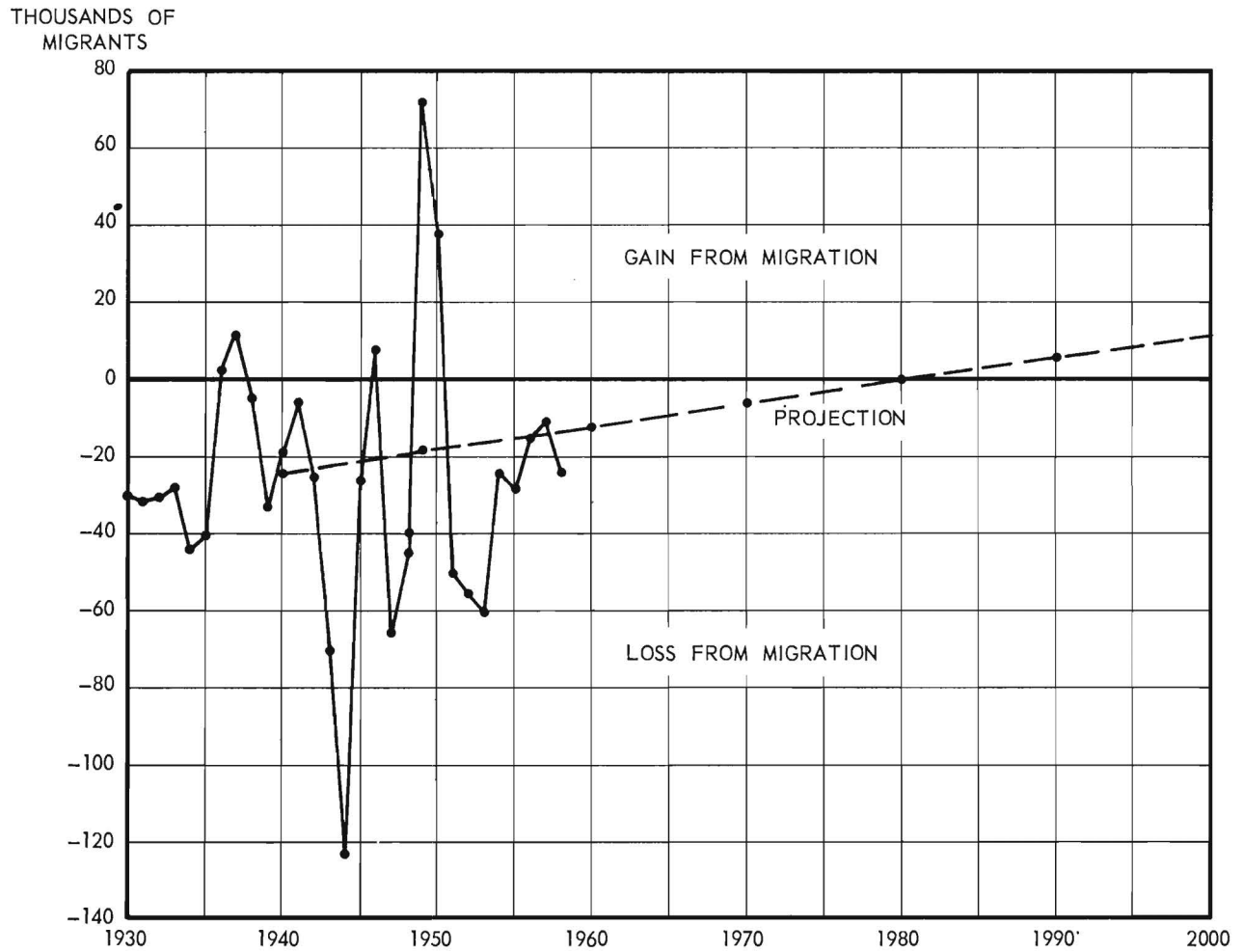
NUMBER  
PER 1000



The net relationship between the crude birth and death rates is natural increase. On the average the rate for Georgia is 30 per cent above the national average. But among the four components of population in Georgia, the lowest rates are among rural whites, which include farmers and all other categories of rural population (small towns and the urban fringe). The second is urban whites; third, urban nonwhites; and fourth, by a wide margin, rural nonwhites. In the period 1950-55, rural whites were 15 per cent higher than the national average; urban whites, 23 per cent higher; urban nonwhites, 31 per cent; and rural nonwhites, 90 per cent above the national average. If the differentials between Georgia and the nation in race were removed, the State would be only 1.5 crude births higher; but deaths would be 1.5 lower. The result would be a natural rate of increase of 18.5, or 23 per cent above the national rate. As mentioned above, however, it is believed that growing urbanization in the South may in time remove much of the differential in death rates.

Trend in Migration Loss. The trends in net migration of people from Georgia are shown in Chart III. The top part shows gains in the State's population from in-migration; the lower part of the chart shows losses. In the period from 1930 to 1958, there were only five years of gains from migration; they were 1936 and 1937, 1946, 1949 and 1950. The years 1936 and 1937 occurred during the depression when the South experienced a relatively large textile boom. 1946 reflected the return of soldiers following war demobilization. 1949 was a recession year and probably represented the return of many migrants from factories in the Midwest and the Northeast to Georgia's farms and small towns. 1950 was a war year and reflected the transfer of troops to Georgia camps. Losses from migration were comparatively moderate, except in 1942 and 1944 which were caused by heavy movement of troops from camps in Georgia to overseas. 1947 and 1948, and

CHART III  
TREND IN POPULATION MIGRATION FROM GEORGIA, 1950-1958, WITH  
PROJECTIONS TO 2000



1951-53 also represent comparatively heavy losses.

For the period from 1950 to 1958, Georgia lost 41 per cent of its natural increase from migration. This was considerably less than the drain from migration during 1940 to 1950 when the loss was 48 per cent. For the period as a whole from 1940 to 1958, a downward trend in migration loss is determined by fitting a logarithmic type of curve. This, extended to 1975 and 2000, shows that migration will shift in 1980 from a loss factor to a gain factor in Georgia's population growth. While the line is drawn as a smooth curve, it is expected that migration changes will fluctuate sharply around this line in the future as in the past.

The basic conclusion from the migration analysis of this section is that migration may be expected to shift from a negative to a positive force in Georgia's population growth around 1980. This presumes the continuation of strong economic development which will supply the jobs to make this important change in migration not only possible, but highly likely.

Full Employment Policy of Federal Government. In 1946, by Act of Congress, the maintenance of full employment became an established policy of the Federal Government. Because of this policy and the built-in stabilizers in the national economy, no major recessions have occurred since the 1930's, when both marriage and birth rates were quite low. In an economy with a high educational level the fertility rate is partially a matter of choice. If unemployment is high and the employment outlook is poor, young people delay marriage and couples choose not to have children. This explains the low birth rates of the 30's. The Full Employment Act and prosperous conditions explain the 25 per cent higher birth rates since World War II; improvements in medical science account

for the 10 per cent lower death rates. The two rates together are responsible for a natural rate of increase currently that is 60 per cent higher than prewar.

A basic condition to projections of fertility rates and population to 2000 is the Employment Act of 1946 and other conditions in the economy which assure the people of the United States and Georgia that no extended periods of serious unemployment will occur. This supports the assumption that the high natural rates of increase of the postwar years will be maintained for an extended period into the future.

### Population Projections

Alternative Projections for Georgia. Chart IV presents four alternative projections of Georgia's population to 2000. All are based on the employment assumption discussed above. The differences among the four projections are due to the assumption's relative to natural increase and migration. Projection I assumes that the natural rate of increase for the period 1940-1958 will prevail until 2000, but that migration losses from the State will decline until 1980, after which they will become gains as shown in Chart III. Projection II assumes that both the natural rate of increase and migration loss for the period 1950-1958 will prevail until 2000. Projection III is based on a projection of Georgia's population ratio to the United States' population. These ratios are then applied to projections<sup>1/</sup> of United States population to the year 2000.

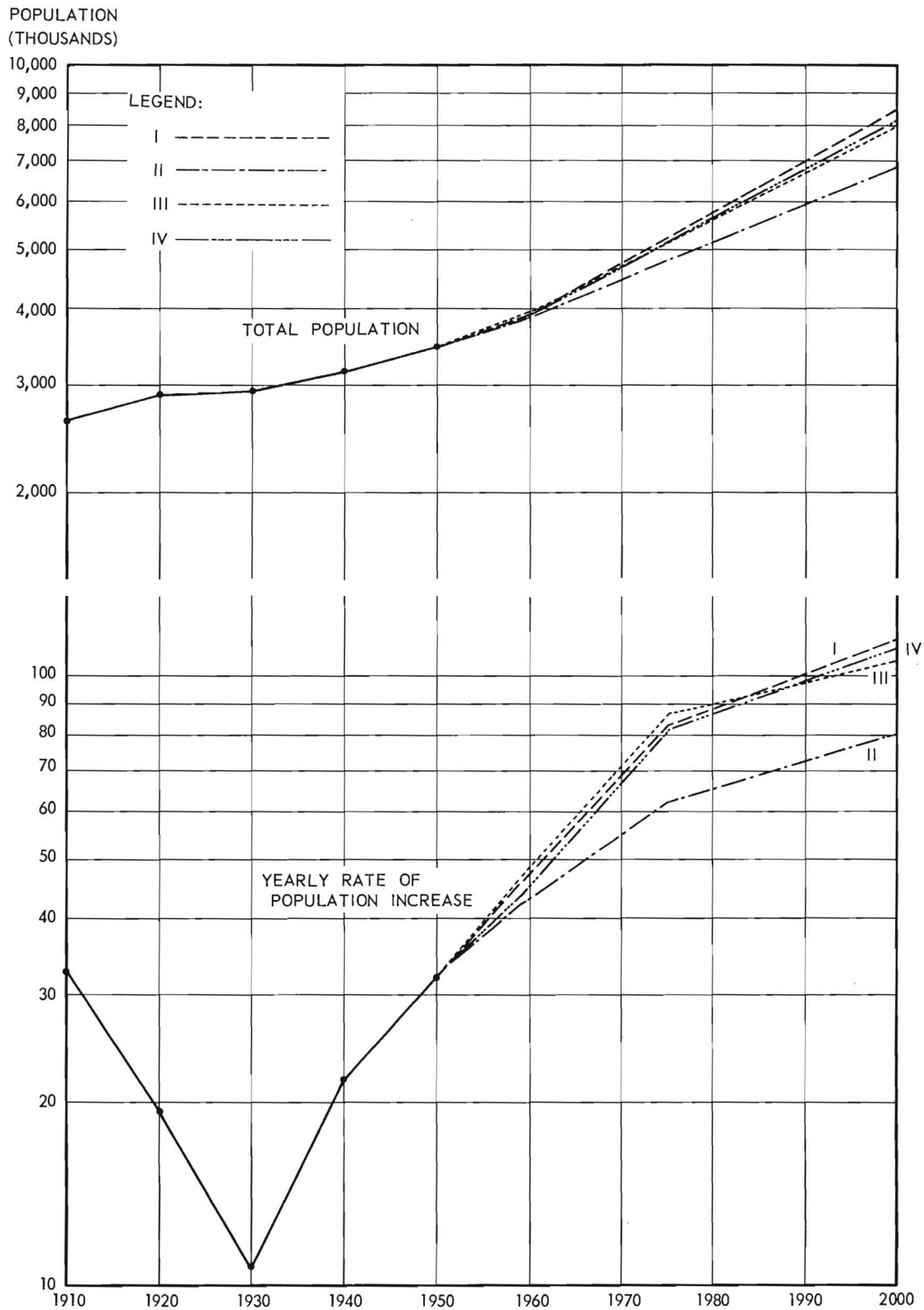
Projection IV is based on a fertility rate which is calculated from population components for the State. Other assumptions which govern this projection are:

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<sup>1/</sup>From the DELAWARE STUDY.



CHART IV  
TRENDS IN TOTAL POPULATION IN GEORGIA 1910-1950  
WITH PROJECTIONS TO 2000 BY FOUR METHODS



1. Crude birth and death rates, and natural increase, for 1950-1955 for each of the four components are assumed to continue throughout the period.
2. The population composition of Georgia is represented by the trend in ratios shown in Chart I. The natural rate of increase is computed by combining the rates from assumption 1, according to these ratios.
3. An accelerating rate of growth in Georgia's economy will reverse the migration movements of population from the State in 1980, as shown in Chart III.<sup>2/</sup>
4. The 1946 Employment Act is assumed to prevent widespread unemployment for any extended duration of time.

The results of the four projections are given in Table 2 below.

TABLE 2

Georgia's Population by Census Decades from 1930 to 1950, with Projections for 1960, 1975, and 2000 by Four Methods

Year	Population (thousands)			
1930	2909			
1940	3124			
1950	3445			
Projections:	I	II	III	IV
1960	3900	3870	3910	3890
1975	5150	4800	5180	5140
2000	8400	6800	8000	8160

Projection IV is preferred and recommended because the method is based on more realistic assumptions relative to the natural rate of increase.

Projections for Basin Areas. The population estimates for four states are given below. Data for Alabama, Florida, and South Carolina are taken directly from the report of the Select Committee on National Water Resources, United States Senate.<sup>2a/</sup>

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<sup>2/</sup> The assumption relative to migration reversal after 1980 accounts for 150,000 of the estimate by method IV for the year 2000.

<sup>2a/</sup>Water Resources Activities in the United States: Population Projections and Economic Assumptions, 86th Congress, 2d Session, Committee Print No. 5, March 1960, p. 29.

	<u>1960</u>	<u>1975</u>	<u>2000</u>
Alabama	3,190	4,175	6,507
Georgia	3,890	5,140	8,160
South Carolina	2,460	3,269	5,249
Florida	4,965	7,121	12,886

The Georgia data for 1960, 1975, and 2000 are the projections by method IV, described above. The 1960 data for Alabama, South Carolina, and Florida represent projections from the 1958 Census Bureau estimates for the two years based on yearly rates of increase from 1950-1958.

The projections for each basin, except the basins in Florida, were made by applying ratio projections based on trends for the period 1930 to 1950 to the respective state population estimates. In the case of Florida, only the logarithmic type of projection, based on the period 1930 to 1950, proved satisfactory.

The basin and sub-basin actual population for 1930, 1940, and 1950 with projections for 1960, 1975, and 2000 are given in Table 3. For the base period (1930, 1940, and 1950) counties were broken down to basin segments by allocating the farm population on the basis of area and the urban and rural nonfarm population on the basis of the percentage of total urban population in towns and cities in the different county segments. Linear trend lines were fitted to the percentage of total state populations in the different sub-basins, except Florida, for the period 1930, 1940, and 1950. The decade ratios were extrapolated for 1960, 1975, and 2000. The ratios resulting were then applied to state population projections as given above. Several other types of projections were tried, but none proved as generally satisfactory from all standpoints as the ratio projections.

TABLE 3

Population Trends by River Basin and Sub-Basin  
1930, 1940, 1950, with Projections: 1960, 1975, 2000

Basin and State Sub-Basin	In Thousands					
	Census Data			Projections		
	1930	1940	1950	1960	1975	2000
Basin 1						
Georgia	375.3	405.2	453.4	516.6	691.8	1126.1
South Carolina	213.9	223.2	231.2	237.5	286.0	383.8
North Carolina	5.1	6.0	6.6	7.5	9.1	12.4
Total	594.3	634.4	691.2	761.6	986.9	1522.3
Basin 2						
Georgia	161.6	154.2	140.2	133.7	124.6	110.8
Basin 3						
Georgia	700.9	715.8	787.6	862.0	1094.3	1618.9
Basin 4						
Florida	17.9	20.9	24.3	28.3	35.6	52.2
Georgia	95.4	100.4	104.3	113.9	140.8	198.0
Total	113.3	121.3	128.6	142.2	176.4	250.2
Basin 5						
Florida	82.5	89.2	90.2	95.4	102.0	114.0
Georgia	187.4	196.1	199.3	214.7	258.5	344.4
Total	269.9	285.3	289.5	310.1	360.5	458.4
Basin 6						
Florida	87.7	95.8	111.2	123.4	148.1	199.3
Georgia	70.0	68.8	70.2	72.0	80.7	90.6
Total	157.7	164.6	181.4	195.4	228.8	289.9
Basin 7						
Alabama	148.2	151.6	161.7	162.7	203.7	294.8
Florida	52.7	55.3	57.5	60.2	64.3	75.2
Georgia	1001.1	1120.4	1287.0	1520.0	2109.4	3647.9
Total	1202.0	1327.3	1506.2	1742.9	2377.4	4017.9
Basin 8						
Alabama	333.7	339.0	321.2	305.3	333.2	346.8
Florida	137.4	177.8	254.2	340.5	541.0	1170.9
Total	471.1	516.8	575.4	645.8	874.2	1517.7
Summary:						
Alabama	481.9	490.6	482.9	468.0	536.9	641.6
Florida	378.2	439.0	537.4	647.8	891.0	1611.6
Georgia	2591.7	2760.9	3042.0	3432.9	4500.1	7136.7
North Carolina	5.1	6.0	6.6	7.5	9.1	12.4
South Carolina	213.9	223.2	231.2	237.5	286.0	383.8
Total	3670.8	3919.7	4300.1	4793.7	6223.1	9786.1

Source: Census of Population 1930, 1940, and 1950.

For sub-basins in Florida a logarithmic type of curve was fitted to 1930-1950, and the estimates projected directly.

The trends in ratios for the different basins and sub-basins are given in Charts V and VI below. The Georgia ratios are presented in Chart V, while the ratios for Alabama, Florida, and South Carolina are found in Chart VI.

Note particularly in Georgia that basin 7 shows a significant gain in the proportion of the population relative to the State, although area 1 shows a slight upward trend in the population ratio. Basin 7 encompasses the Chattahoochee and Flint Rivers, and includes such thriving population centers as Atlanta, Columbus, and Albany. Basin 1 includes the Savannah River and such large population centers as Augusta and Savannah.

#### Projections of Components of Population Change

The components of population change represent urban, rural nonfarm and rural farm segments of each basin and sub-basin population total. Conceptually, urban population corresponds with the new definition of urban population for 1950 to include urbanized areas. By definition, an urbanized area is an area that includes at least one city with 50,000 inhabitants or more in 1940 or later, according to a special census taken prior to 1950 and also the surrounding closely settled incorporated places and unincorporated places that meet certain other criteria relative to size of place and density of population. Urban population is thus broadly conceived to include the central cities and the closely surrounding densely populated areas.<sup>3/</sup>

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<sup>3/</sup>1950 Census of Population: Vol. II, Characteristics of the Population; Part 1, United States Summary, P. 22.

CHART V  
TREND IN RIVER BASIN AND SUB-BASIN POPULATION RATIOS IN GEORGIA, 1930, 1940, 1950, WITH PROJECTIONS TO 1960, 1975, AND 2000

PER CENT OF  
STATE TOTAL  
POPULATION

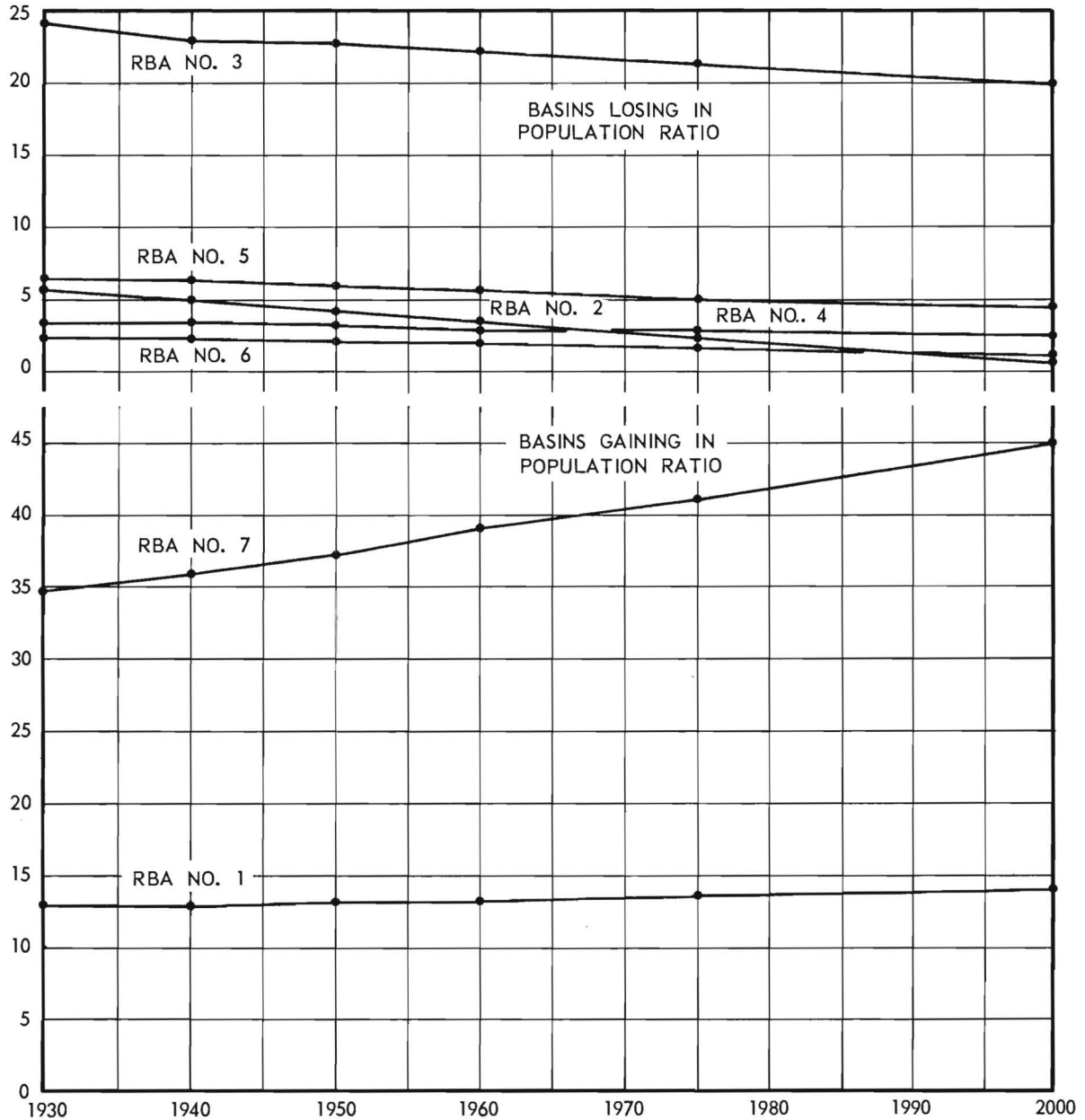
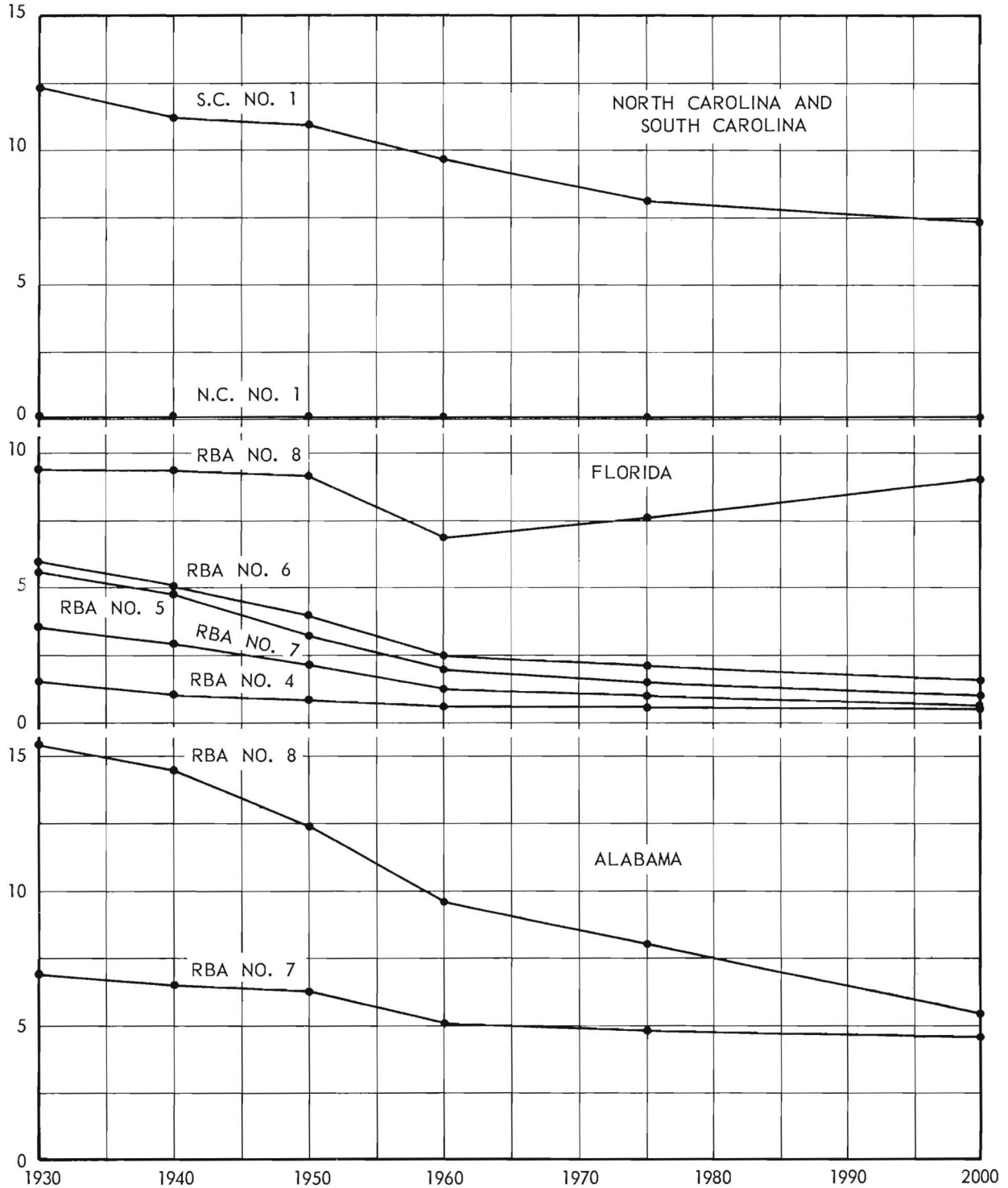


CHART VI  
TREND IN RIVER SUB-BASIN POPULATION RATIOS FOR ALABAMA, FLORIDA, NORTH  
CAROLINA, AND SOUTH CAROLINA, 1930, 1940, AND 1950, WITH  
PROJECTIONS TO 1960, 1975, AND 2000

PER CENT OF  
STATE  
POPULATION



Projections of the three components of population were based on a linear equation fitted to the ratios of each component to total population for the period 1930 to 1950 and extrapolated to 1960, 1975, and 2000. The assumption is that the forces which produced rapid growth of urban centers and the rural nonfarm areas in the past will persist. It was further assumed that the scientific progress and evolutionary changes in agriculture would also continue, and consequently with a further shrinkage in farm population. In the case of urban population, projections were based on two steps. First, the urban population ratios for each sub-basin were projected on the basis of the old definition of urban population. Secondly, the ratio of the difference between the old definition and the new definition of urban population in 1950 was added as a constant to each of the three projections, 1960, 1975, and 2000. The three ratios were adjusted to 100 for each projection year by adjusting the rural nonfarm population ratio for the difference. The adjustments were generally comparatively small. The ratios to total population thus derived were applied directly to total population estimates for each sub-basin. The projections of the three components are given in Tables 4, 5, and 6. Urban population for 1930 to 1950 with projections to 2000 are given in Table 4; rural nonfarm in Table 5; and rural farm in Table 6.

The urban population for the entire study area is projected for an increase of 4,747,000 from 1950 to 2000, or 253 per cent. Basin 7 has a projected gain of 275 per cent and the largest absolute gain in urban population.

Rural nonfarm population is projected for an increase from 1,197,800 in 1950 to 2,514,700 in 2000, an increase of 110 per cent. Thus the potential urban growth is substantially larger both absolutely and relatively than rural nonfarm.



TABLE 4

Urban Population Trends by River Basins and Sub-basins  
for 1930, 1940, 1950, with Projections to 1960, 1975, 2000

		(In Thousands)				
Basin and State Sub-basin	1930	1940	1950	1960	1975	2000
Basin 1						
Georgia	155.6	186.6	244.0	297.6	438.6	822.1
North Carolina	0.6	1.0	1.8	1.9	2.7	4.3
South Carolina	25.6	36.4	64.9	77.6	114.4	200.0
Total	181.8	224.0	310.7	377.1	555.7	1026.4
Basin 2						
Georgia	16.1	13.6	17.2	17.2	18.9	21.2
Basin 3						
Georgia	161.0	186.8	337.5	405.1	601.9	1107.3
Basin 4						
Florida	5.7	7.0	9.4	11.3	15.6	26.2
Georgia	18.7	21.2	28.7	34.7	50.5	88.9
Total	24.4	28.2	38.1	46.0	66.1	115.1
Basin 5						
Florida	7.9	12.1	18.3	22.5	31.6	49.2
Georgia	37.0	44.4	69.5	87.0	131.8	235.9
Total	44.9	56.5	87.8	109.5	163.4	285.1
Basin 6						
Florida	19.0	26.1	43.9	57.6	83.7	144.9
Georgia	16.8	20.5	24.9	29.4	36.1	47.8
Total	35.8	46.6	68.8	87.0	119.8	192.7
Basin 7						
Alabama	30.8	33.8	65.8	74.5	106.7	196.9
Florida	9.6	11.9	15.2	17.3	21.9	32.1
Georgia	432.2	515.1	729.3	918.1	1404.9	2808.9
Total	472.6	560.8	810.3	1009.9	1533.5	3037.9
Basin 8						
Alabama	53.4	60.2	91.9	102.0	142.6	203.2
Florida	40.4	52.7	117.4	161.7	271.0	638.0
Total	93.8	112.9	209.3	263.7	413.6	841.2
Summary:						
Alabama	84.2	94.0	157.7	176.5	249.3	400.1
Florida	82.6	109.8	204.2	270.4	423.8	890.4
Georgia	837.4	988.2	1451.1	1789.1	2682.7	5132.1
North Carolina	0.6	1.0	1.8	1.9	2.7	4.3
South Carolina	25.6	36.4	64.9	77.6	114.4	200.0
Total	1030.4	1229.4	1879.7	2315.5	3472.9	6626.9

Source: Ibid. Table III.

TABLE 5

Rural Nonfarm Population Trends by Basins and Sub-basins  
for 1930, 1940, 1950, with Projections to 1960, 1975, 2000

		(In Thousands)				
Basin and State Sub-basin	1930	1940	1950	1960	1975	2000
Basin 1						
Georgia	63.5	68.2	109.4	135.3	193.7	254.5
North Carolina	3.2	3.8	3.8	4.9	6.0	7.8
South Carolina	63.9	71.6	85.7	100.5	140.1	160.8
Total	130.6	143.6	198.9	240.7	339.8	423.1
Basin 2						
Georgia	21.4	26.7	50.2	53.8	57.9	49.0
Basin 3						
Georgia	191.2	170.4	208.6	251.7	341.4	385.3
Basin 4						
Florida	6.7	8.1	11.0	13.4	16.7	23.1
Georgia	28.6	30.9	32.0	40.7	59.6	82.8
Total	35.3	39.0	43.0	54.1	76.3	105.9
Basin 5						
Florida	21.8	21.9	31.3	37.4	42.5	42.1
Georgia	42.4	45.1	50.2	58.0	68.9	58.2
Total	64.2	67.0	81.5	95.4	111.4	100.3
Basin 6						
Florida	38.4	37.8	41.8	43.2	46.2	42.5
Georgia	3.6	1.5	14.9	13.5	20.6	22.0
Total	42.0	39.3	56.7	56.7	66.8	64.5
Basin 7						
Alabama	27.3	32.7	42.2	43.9	59.1	67.2
Florida	18.3	17.5	20.5	23.0	25.3	30.4
Georgia	162.6	194.2	307.4	387.6	544.2	711.3
Total	208.2	244.4	370.1	454.5	628.6	808.9
Basin 8						
Alabama	69.5	67.6	89.0	93.4	95.6	66.3
Florida	53.9	79.5	99.8	145.3	241.8	511.4
Total	123.4	147.1	188.8	238.7	337.4	577.7
Summary:						
Alabama	96.8	100.3	131.2	137.3	154.7	133.5
Florida	139.1	164.8	204.4	262.3	372.5	649.5
Georgia	513.3	537.0	772.7	940.6	1286.3	1563.1
North Carolina	3.2	3.8	3.8	4.9	6.0	7.8
South Carolina	63.9	71.6	85.7	100.5	140.1	160.8
Total	816.3	877.5	1197.8	1445.6	1959.6	2514.7

Source: Ibid., Table III.

TABLE 6

Rural Farm Population Trends by River Basins and Sub-basins  
for 1930, 1940, 1950, with Projections to 1960, 1975, 2000

		(In Thousands)				
Basin and State Sub-basin	1930	1940	1950	1960	1975	2000
Basin 1						
Georgia	156.2	150.4	100.0	83.7	59.5	49.5
North Carolina	1.3	1.2	1.0	0.7	0.4	0.3
South Carolina	124.4	115.2	80.6	59.4	31.5	23.0
Total	281.9	266.8	181.6	143.8	91.4	72.8
Basin 2						
Georgia	124.1	113.9	72.8	62.7	47.8	40.6
Basin 3						
Georgia	348.7	358.6	241.5	205.2	151.0	126.3
Basin 4						
Florida	5.5	5.8	3.9	3.6	3.3	2.9
Georgia	48.1	48.3	43.6	38.5	30.7	26.3
Total	53.6	54.1	47.5	42.1	34.0	29.2
Basin 5						
Florida	52.8	55.2	40.6	35.5	27.9	22.7
Georgia	108.0	106.6	79.6	69.7	57.8	50.3
Total	160.8	161.8	120.2	105.2	85.7	73.0
Basin 6						
Florida	30.3	31.9	25.5	22.6	18.2	11.9
Georgia	49.6	46.8	30.6	29.1	24.0	20.8
Total	79.9	78.7	56.1	51.7	42.2	32.7
Basin 7						
Alabama	90.1	85.1	53.7	44.3	37.9	30.7
Florida	24.8	25.9	21.8	19.9	17.1	12.7
Georgia	406.3	411.1	250.1	214.3	160.3	127.7
Total	521.2	522.1	325.6	278.5	215.3	171.1
Basin 8						
Alabama	210.8	211.2	140.3	109.9	95.0	77.3
Florida	43.1	45.6	37.0	33.5	28.2	21.5
Total	253.9	256.8	177.3	143.4	123.2	98.8
Summary:						
Alabama	300.9	296.3	194.0	154.2	132.9	108.0
Florida	156.5	164.4	128.8	115.1	94.7	71.7
Georgia	1241.0	1235.7	818.2	703.2	531.1	441.5
North Carolina	1.3	1.2	1.0	0.7	0.4	0.3
South Carolina	124.4	115.2	80.6	59.4	31.5	23.0
Total	1824.1	1812.8	1222.6	1032.6	790.6	644.5

Source: Ibid., Table III.

Rural farm population is projected for a decline from 1,222,600 in 1950 to 644,500 in 2000. This represents a drop of 47 per cent. In view of the prospects for a greatly enlarged market for farm products it means fewer farms but substantially larger farms producing much more efficiently.

#### Population Projections for Eight Major Cities

The projections for the urbanized areas<sup>4/</sup> which appear in Table 7 were derived by fitting a logarithmic curve<sup>5/</sup> to data for the period 1900 to 1960, with extrapolations to 1975 and 2000. The rigid projections thus determined were adjusted to growth rates in recent decades and also for strategic location of the area relative to important growth factors, such as location on a navigable stream or seaport, strength of general trade area development potentials, and governmental and educational factors as generators of economic growth.

The projections show that Tallahassee, which is the location for the State government of Florida and a large educational center, will more than triple in size in 40 years. Atlanta is expected to almost triple; it is one of the South's largest trade and communication centers. Its financial strength and outstanding business leaders will keep the city bursting at its seams for a long period in the future. Albany will probably grow in the period by almost three times also. This city is in a thriving, prosperous agricultural section of the State. There is no other important city for about a hundred miles in any direction. The projection for Pensacola and Escambia County indicates an increase of 177 per cent by 2000. In addition to being a port and thriving recreational area, Pensacola is an important naval training center. Savannah is forecast for a growth of almost 100 per cent, which will be importantly related to the city's port

<sup>4/</sup>Standard Metropolitan Area, or city and county populations in other cases.

<sup>5/</sup>Type:  $Y = ab^x$ .

TABLE 7

Trend in Population From 1900 to 1960 for Selected Growth City Areas in  
The Southeast River Basins, with Projections for 1975 and 2000

Year	(In Thousands) City Areas							
	Atlanta <sup>1</sup>	Savannah <sup>2</sup>	Columbus <sup>3</sup>	Augusta <sup>4</sup>	Macon <sup>5</sup>	Albany <sup>6</sup>	Tallahassee <sup>7</sup>	Pensacola <sup>8</sup>
Census Data:								
1900	198.3	71.2	56.9	92.8	73.4	13.7	19.9	28.3
1910	283.3	79.7	62.2	100.7	80.3	16.0	19.4	38.0
1920	348.6	100.0	71.6	109.3	93.3	20.1	18.1	49.4
1930	462.4	105.4	84.9	120.4	88.3	22.3	23.5	53.6
1940	558.8	118.0	111.3	131.8	95.1	28.6	31.6	74.7
1950	727.0	151.4	158.4	162.0	135.0	43.6	51.6	112.7
1960 <sup>9</sup>	1029.0	183.0	204.1	214.4	179.2	75.2	74.0	173.0
Projections:								
1975	1516.0	236.0	240.0	250.0	230.0	115.0	140.0	235.0
2000	2895.0	358.0	330.0	345.0	320.0	220.0	270.0	480.0

1. Atlanta includes the counties of Clayton, Cobb, DeKalb, Fulton, and Gwinnett.

2. Chatham County.

3. Muscogee County, Georgia, and Russell County, Alabama.

4. Richmond County, Georgia and Aiken County, South Carolina.

5. Bibb and Houston Counties.

6. Dougherty County.

7. Leon County.

8. Escambia County.

9. Preliminary Census reports for 1960.

Source: Census of Population Reports.

development and foreign trade. The other three city areas shown for Georgia Augusta, Columbus, and Macon will also undergo a healthy growth in the 40-year period. It is believed that Augusta's potential is somewhat the greatest of the three due to its strategic location on a navigable stream, the nearby location of the large atomic energy installation in Aiken County, S. C., and the city's proximity to large public power installations. Columbus, although on a navigable stream is perhaps somewhat more limited in potentials because of the proximity of several large cities in almost every direction. Macon, the third city area in this category, lacks a navigable stream and in some business and service areas is limited by Atlanta. South, southeast, and southwest for up to 200 miles are great open spaces with only small towns. This invites the development of a competitive city, provided basic industrial development conditions can be concentrated at some strategic spot.

In 1950, the six cities shown for Georgia constituted 45 per cent of the State's population segment in the study area; in the year 2000 the ratio is expected to be 63 per cent.<sup>6/</sup> For the entire study area, the eight cities shown accounted for 36 per cent of total population in 1950; by the year 2000, population projections for them indicate that they may contain 53 per cent of the study area's population.

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<sup>6/</sup>Related to population projections by method IV.

## Labor Force and Employment

### Factors Influencing the Participation in the Labor Force

The major forces determining the percentage of the population in the labor force are age distribution of the population, sex of employees, and location of employment. Obviously, the more young children in the population, shown by age classes under fourteen, and the more retired persons, generally persons over 65 years old, the less the proportion of the population in the labor force. This is shown by a simple tabulation for a few representative states. The age distribution effect is shown by the median age.<sup>7/</sup> This is not a very efficient measure of age distribution, but it will serve to demonstrate the point.

TABLE 8

Relation of Median Age to the Percentage of the Population  
in the Labor Force, 1950

<u>State</u>	<u>Median Age</u>	<u>Percentage of the Population in the Labor Force</u>
New York	33.9	42.8
Michigan	29.8	39.9
<u>Study Area:</u>		
Alabama	25.5	35.4
Florida	30.9	39.6
Georgia	26.2	38.8
North Carolina	25.0	38.3
South Carolina	23.6	37.7
United States	30.2	39.9

Source: 1950 Census of Population; Vol. II, Part 1.

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<sup>7/</sup>1950 Census of Population: Vol. II, Characteristics of the Population; Part 1, United States Summary.

The labor force includes all persons, civilian and military, fourteen years old and over classified as employed or unemployed during the week of the Census enumeration.

The data show a direct, though not a particularly strong, relationship between median age and the percentage of the population classified in the labor force. A rapidly growing population from natural increase tends to have a lower median age than a population which is attracting large numbers of migrants who tend to be mainly in the mature working ages. States which lose a high proportion of natural increase through heavy out-migration tend to have a lower median age for opposite reasons: The migration drain involves primarily the mature working age classes. The study area states, except Florida, are in this category. Yet the strong development trends present in these states may be expected to reduce the out-migration of much of the natural increase and may, in part of the area at least, reduce it to zero by 1980. If this happens it will tend to raise the median age and therefore may be expected to have a positive influence on the proportion of the population in the labor force.

Sex of employees is an important factor influencing the employment ratio. In the United States as a whole, 78.7 per cent of males 14 years old or over were in the labor force in 1950; 28.9 per cent of females 14 years or over were in the labor force.<sup>8/</sup> In the study area the proportions by sex for persons 14 years old or over in 1950 were as follows:

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<sup>8/</sup> Ibid., P. 125.



<u>State</u>	<u>Males</u>	<u>Females</u>
Alabama	77.7	26.4
Florida	75.2	31.2
Georgia	80.6	31.7
North Carolina	80.1	30.7
South Carolina	80.3	33.5

Source: Census of Population 1950; Vol. II, Part 1.

The Alabama ratio for females living in rural farm and rural nonfarm locations is substantially less than in other states in the study area because of comparatively fewer opportunities for employment in textile mills and clothing manufacturing.

The Florida ratio for males apparently is influenced strongly by the retired. The 1950 Census shows that Florida had about 50 per cent more relatively of persons 65 years old and over than the other states.

Over a period of years the proportion of males in the labor force has remained around 78-80 per cent, but the ratio of females in the labor force has been increasing. Since this may be the big change involving the ratio of population in the labor force, any factors affecting female employment will be significant. It is known, of course, that the big increase in sales, clerical, service, and governmental types of jobs have afforded employment outlets for females. This trend has been increasing for some time and is likely to continue. Smaller families and rising educational levels have been other factors moving women into employment outside the home. Yet each of these forces -- the growing employment opportunities, and the conditions in the home and in society affecting the trends toward more females employed -- is peculiarly a phenomenon of an urban culture which not only reflects all of these forces but also generates them.

The influence of location of residence on participation in the labor force of males and females in the study area states is shown by the data in Table 9.

TABLE 9  
Relation of Location of Residence to Participation  
of Males and Females in the Labor Force, 1950

<u>State</u>	<u>Males</u>			<u>Females</u>		
	<u>Urban</u>	<u>Rural Farm</u>	<u>Rural Nonfarm</u>	<u>Urban</u>	<u>Rural Farm</u>	<u>Rural Nonfarm</u>
Alabama	78.5	81.0	72.0	34.5	16.3	21.9
Florida	75.3	79.9	73.5	34.0	23.7	25.2
Georgia	79.5	84.1	78.7	38.8	20.6	28.4
North Carolina	80.0	82.3	78.1	42.3	17.8	29.2
South Carolina	79.4	84.0	77.4	39.9	26.1	32.0
United States	79.3	82.7	74.1	33.2	15.7	22.7

Source: Census of Population 1950; Vol. II, Part 1.

The data show that location does not make much difference in participation of males in the labor force, although the rural farm ratio is the highest and the rural nonfarm is the lowest. The difference in points between the high and the low is about 7, roughly 10 per cent. The difference, in regard to the rural farm ratio is not especially significant, since unpaid farm family workers which tend to be boys over 14 account for most of the difference.

In the case of females, the location of place of residence is highly important. Participation of urban females in the labor force tends to range from 43 per cent more than rural farm females in Florida to 138 per cent greater in North Carolina, where opportunities for women in textile

and apparel factories are very great. The location factor of future employment for women will have a very great impact on future labor force participation rate for the entire population.

Basic economic trends in the study area have been strongly influenced by the shift to an urbanized type of culture and away from a rural farm culture.<sup>2/</sup> The effects of these two types of shifts on per cent of the total population in the labor force is represented in the scattergram, presented in Chart VII. This scattergram is taken from a sample of counties representing the Southeast River Basins area. It is to be noted that the cluster about the regression line shows that the percentage of population urban has a positive effect on the labor force participation, while the percentage of the population rural farm has a negative effect.

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<sup>2/</sup>There are mathematical reasons why the regression analysis, depicted in Chart VII and applied in the methodology, must be based on only two of the three factors discussed. Since each of the three components of population (urban, rural nonfarm, and rural farm) related to labor force participation is expressed as a percentage of a common total, the total of the three ratios equals 100. Inclusion of all three factors in a regression analysis would therefore involve perfect intercorrelation among the three independents. To proceed in this way is inconsistent with the mathematical model of a regression relationship, and the program on the computer will not run. Logically, nothing is gained in the regression effects with three factors over two. Since solution of the equations by hand methods allocates the total effect among three variables if that many are included with intercorrelation present, the total effect would be allocated to the two remaining factors if the one factor producing the perfect intercorrelation were omitted. The procedure decided upon in the case of labor force participation was to employ two factors without any intercorrelation. Analysis of the ratios for the three factors demonstrated that the urban and rural farm ratios were the most volatile of the three factors; therefore, the regression analysis to estimate future labor force participation was based only on the urban and the rural farm ratios to total population as independent factors. The dependent factor was the ratio of total population in the labor force by counties in 1950.

In making the forecast of the labor force estimates for the sub-basin areas, the methodology involved the following procedures:

1. The assumption that the relationships of percentage of population urban and percentage of population rural farm to participation of the population in the labor force for 1950 are firmly established as scientific conditions, and that these facts will remain relatively the same during the period of the study.
2. A regression equation was calculated for the effects of per cent population urban and per cent population rural farm on the labor force ratio.
3. Urban and rural farm ratios were extrapolated by trend line projections to 1960, 1975, and 2000.
4. The ratios from "3" were substituted in the equation from "2" to estimate the labor force by sub-basins for 1960, 1975, and 2000.
5. The labor force ratios from "4" were applied to the population projections by method IV for sub-basins for 1960, 1975, and 2000. The results are the labor force estimates for 1960, 1975, and 2000, given in Table 10.

The results show some rather significant changes. For the basin composite the percentage increase from 1950 to 1960 is 12 per cent; from 1960 to 1975, 32 per cent; and from 1975 to 2000, 62 per cent. The increase from 1950 to the year 2000 is 140 per cent. This is a rather large change but is conservative<sup>10/</sup> in view of the fact that the effect on the labor force ratio of the probable increase in median age could not be effectively calculated.

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<sup>10/</sup>The probable rise in the median age of the area's population would be expected to increase, above the levels shown, the labor force participation.

CHART VII  
RELATIONSHIP OF THE PERCENTAGE OF POPULATION URBAN AND RURAL FARM TO  
THE PERCENTAGE OF TOTAL POPULATION IN THE LABOR FORCE, 1950

PER CENT OF  
POPULATION  
IN THE  
LABOR FORCE

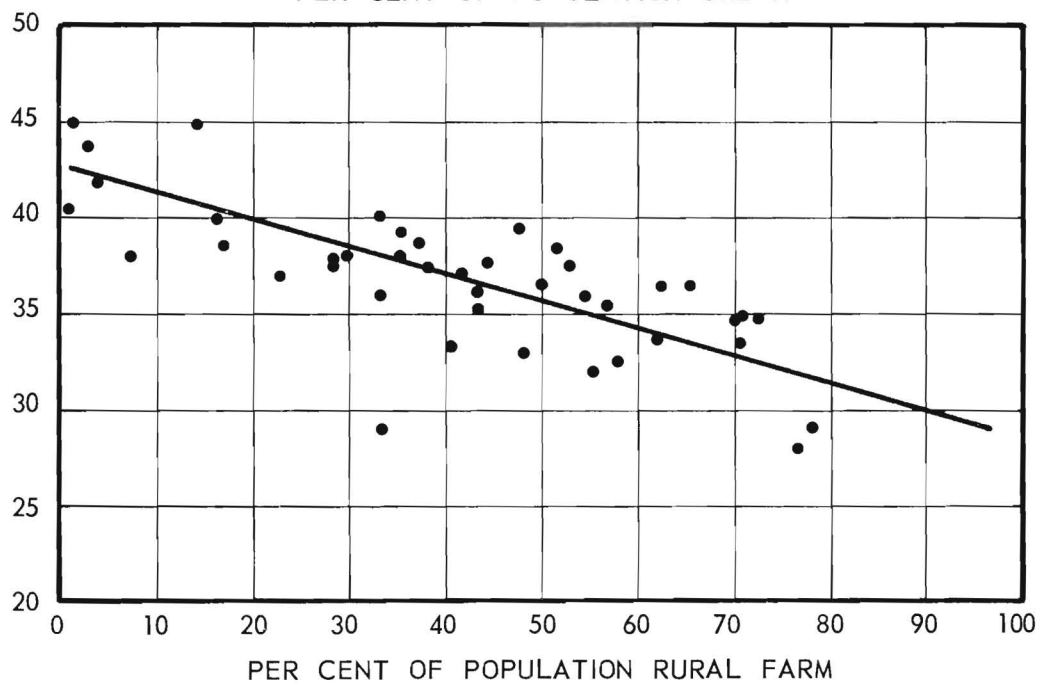
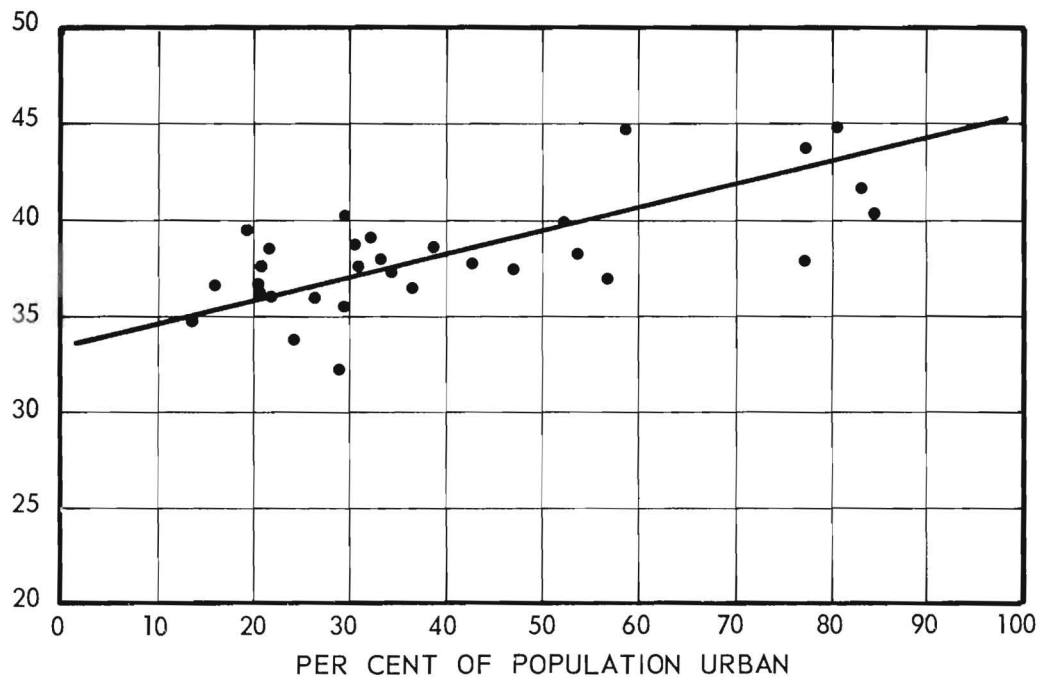


TABLE 10

Trends in Labor Force by River Basins and Sub-basins  
for 1940 and 1950, with Projections to 1960, 1975, 2000  
(In Thousands)

Basin & State Sub-basin	1940	1950	1960	1975	2000
<u>Basin 1</u>					
Georgia	162.5	180.0	206.5	281.2	468.0
North Carolina	2.0	2.0	2.3	2.8	3.9
South Carolina	86.0	87.7	89.5	110.5	153.0
Total	250.5	269.7	298.3	394.5	624.9
<u>Basin 2</u>					
Georgia	54.9	49.2	47.4	44.7	40.1
<u>Basin 3</u>					
Georgia	272.1	297.4	335.3	435.6	665.4
<u>Basin 4</u>					
Florida	7.6	8.3	9.8	12.4	18.4
Georgia	35.7	37.0	40.8	50.8	73.3
Total	43.3	45.3	50.6	63.2	91.7
<u>Basin 5</u>					
Florida	29.8	30.5	32.6	35.3	40.5
Georgia	70.0	71.4	78.6	97.7	136.0
Total	99.8	101.9	111.2	133.0	176.5
<u>Basin 6</u>					
Florida	35.6	43.5	48.9	59.4	81.3
Georgia	25.3	26.6	27.7	31.8	36.8
Total	60.9	70.1	76.6	91.2	118.1
<u>Basin 7</u>					
Alabama	61.0	60.8	63.0	80.4	122.0
Florida	18.0	19.0	20.1	21.7	25.8
Georgia	473.7	527.8	612.1	864.0	1529.2
Total	552.7	607.6	695.2	966.1	1677.0
<u>Basin 8</u>					
Alabama	118.1	111.3	106.9	119.0	129.4
Florida	63.9	92.2	123.9	197.5	429.7
Total	182.0	203.5	230.8	316.5	559.1
<u>Summary:</u>					
Alabama	179.1	172.1	169.9	199.4	251.4
Florida	154.9	193.5	235.3	326.3	595.7
Georgia	1094.2	1189.4	1348.4	1805.8	2948.8
North Carolina	2.0	2.0	2.3	2.8	3.9
South Carolina	86.0	87.7	89.5	110.5	153.0
Total	1516.2	1644.7	1845.4	2444.8	3952.8

Source of basic data: Census of Population, 1940 and 1950.

The percentage increase in labor force from 1950 to 2000 for the sub-basins are as follows: Basin 1, 132 per cent; Basin 2, -18 per cent; Basin 3, 124 per cent; Basin 4, 102 per cent; Basin 5, 73 per cent; Basin 6, 68 per cent; Basin 7, 176 per cent; and Basin 8, 175 per cent. Thus it is seen that Basins 1, 7, and 8 show potentially the greatest growth in labor force. These changes, however, have already been foreshadowed by the comparatively larger population growth already forecast for these areas. All have city complexes which are expected to become larger and more commercialized and industrialized in the next forty years.

#### Factors Influencing Unemployment

The factors determining unemployment are associated with conditions leading to economic instability. Heavy industry which fluctuates more than the business cycle is widely recognized as a causative factor. Therefore conditions which reflect concentration of industrialization and the factors associated with it, such as urbanization, must be recognized as being associated with a troublesome phenomenon in our modern life.

The tabulation below shows a positive relationship between urbanization and unemployment in 1950:

<u>State</u>	<u>Per Cent of Population Urban</u>	<u>Per Cent of Labor Force Unemployed</u>
New York	85.5	6.0
Pennsylvania	70.5	5.4
Illinois	77.6	4.0
Ohio	70.2	4.4
Georgia	45.3	3.4

Source: Census of Population, 1950; Vol. II, Part 1.

Another factor that has a bearing on unemployment at the local level is the influence of farm life. Although farm labor is often alleged to be underemployed,<sup>11/</sup> there is still a job to do, even though it may not be full employment at as profitable a job as one would like. Farmers and farm labor are not as subject to the swings of the business cycle as the city man who depends on the whims of market demand and his employer to hold a paying job.

The following tabulation indicates an inverse relationship between the percentage of employment in agriculture, forestry, and fisheries and the percentage of the labor force unemployed in 1950:

<u>State</u>	<u>Percentage of Employment in Agriculture</u>	<u>Percentage of Labor Force Unemployed</u>
New York	3.0	6.0
Michigan	6.8	5.4
Georgia	22.1	3.4
Iowa	28.5	1.8

Source: Ibid.

Chart VII is a scattergram showing the relationship of the ratios of total population urban and rural farm<sup>12/</sup> to the percentage of the population unemployed in 1950 for a sample of counties from the Southeast River Basins area. The regression line indicates that unemployment in 1950 was a direct function of the percentage of population urban and an inverse function of the percentage of the population rural farm. This shows application of state relationships hypothesized and demonstrated in calculations above to county areas. The results are in accord with expectations. Assuming that

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<sup>11/</sup>Much of this underemployment, so called, is a matter of individual choice on the part of farmers. They prefer leisure to hunt or fish, to working fully through the Fall and Winter as many city workers.

<sup>12/</sup>The reasons for employing two independent factors are explained in the footnote above on labor force.



the relationships shown for 1950 are firmly established and will continue to apply for the period of the study, we proceed in a four-step **stage** (steps 2 through 5) as outlined above for labor force, to develop estimates for unemployment for river basins and sub-basins.

The projections to 1960, 1975, and 2000 are given in Table 11. These data bear a parallel relationship to the labor force data given in Table 10 above. It is noted that for the basin complex unemployment is expected to increase from 51,600 in 1950 to 145,400 in 2000, an increase of 182 per cent, in contrast with an increase of 140 per cent in the total labor force. The somewhat larger increase in unemployment is due to the comparatively greater influence of urbanization on unemployment.

#### Projections of Employment

Since the relationship of employment to labor force and unemployment is expressed by a simple algebraic formula, the projections were derived by subtracting unemployment from the labor force (data in Table 11 from data given in Table 10). The results are given in Table 12.

For the whole study area, in order to achieve the population and income projections previously given, employment must more than double during the 50-year period from 1950 to 2000. The percentage increases are as follows: From 1950 to 1960, 12 per cent; 1960 to 1975, 32 per cent; and from 1975 to 2000, 61 per cent. Basin increases from 1950 to 2000 are: Basin 1, 133 per cent; Basin 2, -18 per cent; Basin 3, 122 per cent; Basin 4, 100 per cent; Basin 5, 70 per cent; Basin 6, 67 per cent; Basin 7, 174 per cent; and Basin 8, 172 per cent.

The yearly increases in employment for the composite area are: 1950 to 1960, 19,750 jobs; 1960 to 1975, 38,200 jobs; and 1975 to 2000, 57,800 jobs.

CHART VIII  
RELATIONSHIP OF THE PERCENTAGE OF POPULATION URBAN AND RURAL FARM TO  
THE PERCENTAGE OF TOTAL POPULATION UNEMPLOYED, 1950

PER CENT OF  
POPULATION  
UNEMPLOYED

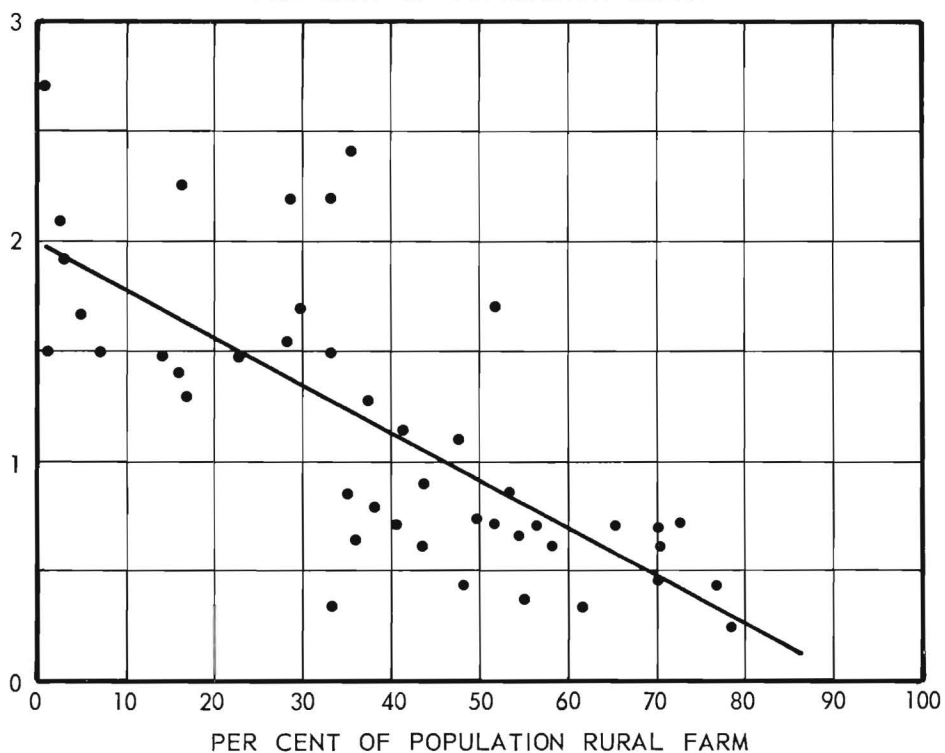
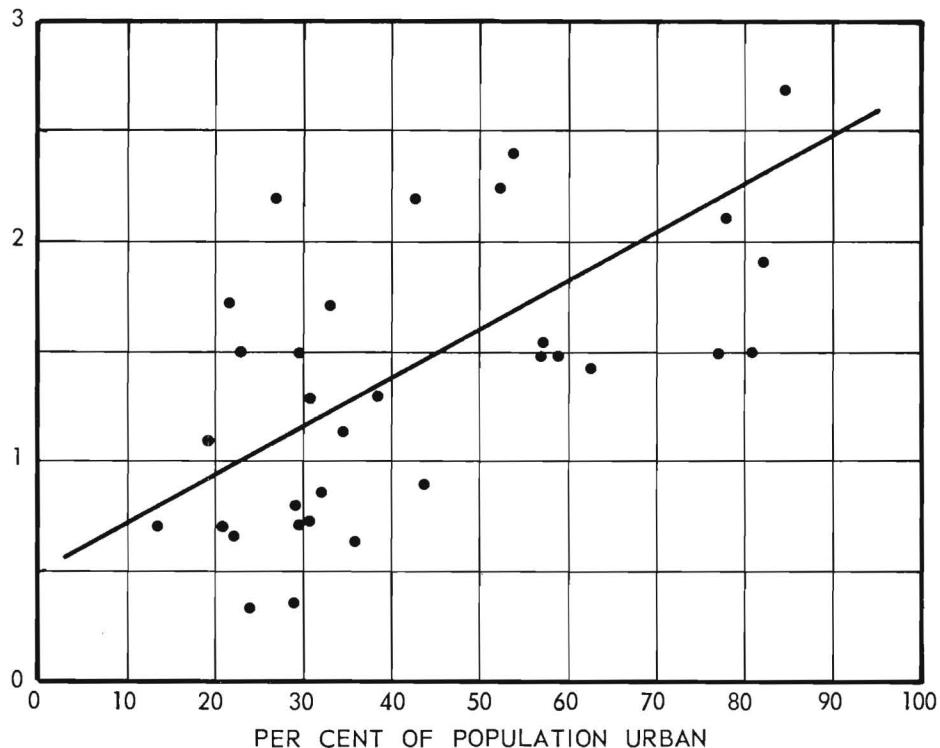


Table 11

Trends in Unemployment by River Basins and Sub-basins  
for 1940 and 1950, with Projections to 1960, 1975, 2000  
(In thousands)

<u>Basin &amp; State</u> <u>Sub-basin</u>	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1975</u>	<u>2000</u>
<u>Basin 1</u>					
Georgia	11.7	8.4	6.3	9.4	16.8
North Carolina	0.1	0.1	0.1	0.1	0.2
South Carolina	<u>3.1</u>	<u>2.5</u>	<u>2.1</u>	<u>3.3</u>	<u>4.8</u>
Total	14.9	11.0	8.5	12.8	21.8
<u>Basin 2</u>					
Georgia	1.6	1.2	0.6	0.7	0.7
<u>Basin 3</u>					
Georgia	12.1	8.4	9.1	13.4	22.8
<u>Basin 4</u>					
Florida	0.3	0.2	0.3	0.4	0.6
Georgia	<u>1.3</u>	<u>0.8</u>	<u>1.0</u>	<u>1.6</u>	<u>2.5</u>
Total	1.6	1.0	1.3	2.0	3.1
<u>Basin 5</u>					
Florida	1.2	0.7	0.9	1.1	1.6
Georgia	<u>1.8</u>	<u>2.0</u>	<u>2.5</u>	<u>3.7</u>	<u>5.8</u>
Total	3.0	2.7	3.4	4.8	7.4
<u>Basin 6</u>					
Florida	1.7	1.0	1.3	1.7	2.5
Georgia	<u>0.9</u>	<u>0.7</u>	<u>0.8</u>	<u>1.1</u>	<u>1.4</u>
Total	2.6	1.7	2.1	2.8	3.9
<u>Basin 7</u>					
Alabama	2.1	1.5	1.6	2.3	4.0
Florida	1.0	0.6	0.7	0.9	1.1
Georgia	<u>28.6</u>	<u>16.6</u>	<u>19.1</u>	<u>29.5</u>	<u>56.2</u>
Total	31.7	18.7	21.4	32.7	61.3
<u>Basin 8</u>					
Alabama	5.9	3.1	3.1	3.6	4.4
Florida	<u>5.1</u>	<u>3.8</u>	<u>5.4</u>	<u>9.0</u>	<u>20.0</u>
Total	11.0	6.9	8.5	12.6	24.4
<u>Summary:</u>					
Alabama	8.0	4.6	4.7	5.9	8.4
Florida	9.3	6.3	8.6	13.1	25.8
Georgia	58.0	38.1	39.4	59.4	106.2
North Carolina	0.1	0.1	0.1	0.1	0.2
South Carolina	<u>3.1</u>	<u>2.5</u>	<u>2.1</u>	<u>3.3</u>	<u>4.8</u>
Total	78.5	51.6	54.9	81.8	145.4

Source: Ibid.

TABLE 12

Trends in Employment by River Basins and Sub-basins  
for 1940 and 1950, with Projections to 1960, 1975, 2000

(In thousands)

Basin & State Sub-basin	1940	1950	1960	1975	2000
<u>Basin 1</u>					
Georgia	150.8	171.6	200.2	271.8	451.2
North Carolina	1.9	1.9	2.2	2.7	3.7
South Carolina	82.9	85.2	87.4	107.2	148.2
Total	235.6	258.7	289.8	381.7	603.1
<u>Basin 2</u>					
Georgia	53.3	48.0	46.8	44.0	39.4
<u>Basin 3</u>					
Georgia	260.0	289.1	326.2	422.2	642.6
<u>Basin 4</u>					
Florida	7.3	8.1	9.5	12.0	17.8
Georgia	34.4	36.2	39.8	49.2	70.8
Total	41.7	44.3	49.3	61.2	88.6
<u>Basin 5</u>					
Florida	28.6	29.8	31.7	34.2	38.9
Georgia	68.2	69.4	76.1	94.0	130.2
Total	96.8	99.2	107.8	128.2	169.1
<u>Basin 6</u>					
Florida	33.9	42.5	47.6	57.7	78.8
Georgia	24.4	25.9	26.9	30.7	35.4
Total	58.3	68.4	74.5	88.4	114.2
<u>Basin 7</u>					
Alabama	58.9	59.3	61.4	78.1	118.0
Florida	17.0	18.4	19.4	20.8	24.7
Georgia	445.1	511.2	593.0	834.5	1473.0
Total	521.0	588.9	673.8	933.4	1615.7
<u>Basin 8</u>					
Alabama	112.2	108.2	103.8	115.4	125.0
Florida	58.8	88.4	118.5	188.5	409.7
Total	171.0	196.6	222.3	303.9	534.7
<u>Summary:</u>					
Alabama	171.1	167.5	165.2	193.5	243.0
Florida	145.6	187.2	226.7	313.2	569.9
Georgia	1036.2	1151.4	1309.0	1746.4	2842.6
North Carolina	1.9	1.9	2.2	2.7	3.7
South Carolina	82.9	85.2	87.4	107.2	148.2
Total	1437.7	1593.2	1790.5	2363.0	3807.4

Source: Ibid.

TABLE 13

Ratio of Employment to Total Population  
by River Basins and Sub-basins for 1940 and 1950,  
with Projections to 1960, 1975, and 2000

<u>Basin &amp; State</u> <u>Sub-basin</u>	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1975</u>	<u>2000</u>
<u>Basin 1</u>					
Georgia	37.2	37.8	38.8	39.3	40.1
North Carolina	31.7	28.8	29.4	29.6	30.0
South Carolina	<u>37.1</u>	<u>36.8</u>	<u>36.8</u>	<u>37.5</u>	<u>38.6</u>
Total	37.1	37.4	38.0	38.7	39.6
<u>Basin 2</u>					
Georgia	34.6	34.2	35.0	35.3	35.6
<u>Basin 3</u>					
Georgia	36.3	36.7	37.8	38.6	39.7
<u>Basin 4</u>					
Florida	34.9	33.3	33.5	33.8	34.1
Georgia	<u>34.3</u>	<u>34.7</u>	<u>34.9</u>	<u>35.0</u>	<u>35.7</u>
Total	34.4	34.4	34.7	34.7	35.4
<u>Basin 5</u>					
Florida	32.1	33.0	33.2	33.6	34.1
Georgia	34.8	34.8	35.4	36.4	37.8
Total	33.9	34.3	34.8	35.7	37.2
<u>Basin 6</u>					
Florida	35.4	38.2	38.6	38.9	39.7
Georgia	<u>35.5</u>	<u>36.9</u>	<u>37.3</u>	<u>38.0</u>	<u>39.0</u>
Total	35.4	37.7	38.1	38.6	39.4
<u>Basin 7</u>					
Alabama	38.8	36.7	37.7	38.3	40.0
Florida	30.7	32.0	32.2	32.4	32.8
Georgia	<u>39.7</u>	<u>39.7</u>	<u>39.0</u>	<u>39.6</u>	<u>40.4</u>
Total	39.2	39.1	38.7	39.3	40.2
<u>Basin 8</u>					
Alabama	33.1	33.7	34.0	34.6	36.0
Florida	<u>33.1</u>	<u>34.8</u>	<u>34.8</u>	<u>34.8</u>	<u>35.0</u>
Total	33.1	34.2	34.4	34.8	35.2
<u>Summary:</u>					
Alabama	34.9	34.7	35.3	36.0	37.9
Florida	33.2	34.8	35.0	35.2	35.4
Georgia	37.5	37.8	38.1	38.8	39.8
North Carolina	31.7	28.8	29.4	29.6	30.0
South Carolina	<u>37.1</u>	<u>36.8</u>	<u>36.8</u>	<u>37.5</u>	<u>38.6</u>
Total	36.7	37.0	37.3	38.0	38.9

Source: Computed by expressing data in Table 12 as a ratio to data in Table 3.

The comparisons show that in the 25-year period from 1975 to 2000 the growth rate is expected to be 2.9 times the growth rate of the 10-year period from 1950 to 1960. This is a large jump in growth rate but within the limits of practical achievement, provided a sufficiently aggressive development program is formulated and properly implemented. The growth rates projected for 1975 to 2000 are no greater than those already being achieved by some states now of a population size about equal to that estimated for the study area in the 1975-2000 period.

In order that the ratios of employment to total population for the different basins and sub-basins in the study area can be better visualized and appreciated, Table 13 has been prepared to show sub-basin trends. Note that no drastic changes in the ratios for any of the sub-basins are projected. The largest rises in the employment ratios from 1950 to 2000 are indicated for sub-basins 1, 3, and 5 in Georgia, and sub-basins 7 and 8 in Alabama. These reflect the comparatively stronger influence on the employment ratios of growing trends in the direction of relatively more urban population and relatively much less rural farm population.

#### Projections of Major Categories of Employment

The major categories of employment analyzed in this section are agricultural, manufacturing, and all other (nonagricultural-nonmanufacturing).<sup>13/</sup> Conceptually, the three categories are tied to the 1940 and 1950 Census of Population count of occupations and therefore pertain to workers according to place of residence. Where commuting is extensive, as around Atlanta and some of the other larger cities in Georgia, the differences between employment according to place of residence and employment according to place of

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<sup>13/</sup> In the interest of an abbreviated terminology, we shall use the letters "NANM" in lieu of Nonagricultural-nonmanufacturing.

work may be quite significant, especially in manufacturing employment. However, for most parts of the study area, the difference between the two concepts are insignificant.

The basic methodology in preparing estimates of employment by categories involved four steps:

1. State totals of agricultural and manufacturing employment were projected from the 1930 to 1959 historical base, as some function of population growth, to the year 2000.
2. The agricultural employment<sup>14/</sup> and manufacturing employment ratios for the state segments were projected and applied to the corresponding state total employment of the respective states.
3. Adjustments of the estimates were made in some cases for consistency with expected growth rates of major industries and for the relationship of NANM<sup>15/</sup> to total employment.
4. The actual employment figures for NANM were derived algebraically by subtracting agricultural and manufacturing employment from total employment, as given in Table 12.

The results of the statistical analysis described above are presented in Table 14. It is noted that while total employment for the entire study area is expected to expand by about 2.2 million workers from 1950 to 2000, increases in NANM will be approximately 1.8 million jobs, manufacturing just less than 650,000 jobs, but agricultural employment will decline by 224,900 workers.

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<sup>14/</sup> Agricultural employment is projected as a function of the rural farm population estimates supplied by the department of agricultural economics of the cooperating colleges.

<sup>15/</sup> The relative importance of nonagricultural-nonmanufacturing is expected to rise over the years due to higher per capita incomes, accompanied by a more than proportionate increase in the demand for the intangibles of life.

TABLE 14

Trends in Major Categories of Employment for State Segments of the Study Area for 1940, and 1950, with Projections to 1960, 1975, and 2000

(In Thousands)					
State Segment and Major Employment Category	1940	1950	1960	1975	2000
Alabama					
Agricultural	88.0	39.6	23.0	19.8	16.1
Manufacturing	27.2	39.2	41.0	52.5	78.7
Nonagricultural- Nonmanufacturing	55.9	88.7	101.2	121.2	148.2
Total	171.1	167.5	165.2	193.5	243.0
Florida					
Agricultural	48.8	40.6	24.3	20.0	15.1
Manufacturing	23.4	20.2	27.9	31.2	31.7
Nonagricultural- Nonmanufacturing	73.4	126.4	174.5	262.0	523.1
Total	145.6	187.2	226.7	313.2	569.9
Georgia					
Agricultural	365.8	242.2	135.7	102.5	85.2
Manufacturing	166.7	238.8	299.3	438.9	805.3
Nonagricultural- Nonmanufacturing	503.7	670.4	874.0	1205.0	1952.1
Total	1036.2	1151.4	1309.0	1746.4	2842.6
South Carolina					
Agricultural	34.3	23.5	14.7	7.8	5.9
Manufacturing	20.5	31.8	42.0	52.7	69.0
Nonagricultural- Nonmanufacturing	28.1	29.9	30.7	46.7	73.3
Total	82.9	85.2	87.4	107.2	148.2
Summary <sup>1</sup>					
Agricultural	537.7	346.4	198.1	150.4	122.5
Manufacturing	238.3	330.7	411.2	576.6	986.4
Nonagricultural- Nonmanufacturing	661.7	916.1	1181.2	1636.0	2698.5
Total	1437.7	1593.2	1790.5	2363.0	3807.4

1. Includes also the small segment of North Carolina which was too small to show separately.

Source of basic data for 1940 and 1950: Census of Population for 1940 and 1950; Employment and Earnings, Vol. 5, No. 11, Annual Supplement Issue, May 1959, pp. 78-86, and prior issues from U. S. Dept. of Labor; Farm Employment, Statistical Bulletin No. 236, September 1958, p. 44, and Farm Labor, 1953, pp. 9-12, both from U. S. Dept. of Agriculture; also current issues of Farm Labor.



Confining the analysis to the 40-year period immediately in the future, the estimated net growth in total employment is expected to result from gains of 575,000 jobs in manufacturing and 1,517,000 jobs in NANM, and a decline of 75,000 jobs in agricultural. Thus it is expected that the change in agricultural employment will constitute -3.7 per cent of the total employment growth; manufacturing, 28.5 per cent; and NANM, 75.2 per cent. Converted to annual rates of growth in employment, these projections mean that from 1960 to 1975, the study area's manufacturing employment must expand at the yearly rate of 11,000 jobs; and NANM, 30,300 jobs yearly. During 1975 to 2000, these rates must be stepped up considerably to 16,400 jobs yearly in the case of manufacturing and to 42,500 jobs yearly for NANM.

## Personal Income

Total personal income is a product of two factors: population and productivity. Population is the result of a natural force that develops out of the biological nature of man. In the United States as a whole the yearly percentage increase of population compounded was 1.74 per cent between 1950 and 1958 (from 1940 to 1950 1.4 per cent). The five states represented in the study area had yearly percentage increases for 1950-1958 as follows: Alabama, 0.4; Florida, 5.9; Georgia, 1.1; and South Carolina, 1.5.<sup>16/</sup> The second factor, productivity, refers to rise in real output per hour of labor input. Mills shows that man-hour productivity from 1930 to 1950 averaged 1.85 per cent yearly compounded.<sup>17/</sup> The trends in productivity historically have been established at about 2.1 per cent yearly.<sup>18/</sup> The product of the two components of personal income would thus give a growth rate in real income of 3.1 to 3.6 per cent yearly. The authors of the DELAWARE STUDY refer to a long run growth in the United States in real output equal to 3 per cent yearly compounded, and proceed to project the national economy to 1980 and 2010 at this rate of growth. However, when taken in conjunction with population projections, derived independently, the increase in real per capita income rises at the rate of 1.67 per cent yearly compounded. Such a measure of increase in productivity is crude at best, because the proportion of the population in the labor force

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<sup>16/</sup> Current Population Reports: Population Estimates, Series P-25, No. 208, December 7, 1959, p. 7.

<sup>17/</sup> Mills, Frederick C., Productivity and Economic Progress, Occasional paper 38, National Bureau of Economic Research, 1952, pp. 1-3.

<sup>18/</sup> Kendrick, John W., "National Productivity and Its Long-term Projections," In Long-range Economic Projection: Studies in Income and Wealth, Vol. 16, National Bureau of Economic Research, Princeton University Press, 1954, pp. 85-88.

fluctuates due to the changes in age distribution and other factors.

Bratt<sup>19/</sup> gives four major factors influencing labor productivity as follows:

1. Change in the effectiveness of a man-hour because of changes in labor quality -- including character of the labor force, fatigue, and interest of the employee.
2. Changes in efficiency growing out of changes in type and quality of raw materials available.
3. Changes in efficiency growing out of the use of capital, revised plant layout and management decisions in general.
4. Change in the composition of output.

All four factors are important to future rises in productivity in the South, but numbers 1, 3, and 4 may have the greatest impacts in the period of this study. The rise in educational level and broadened training programs to produce skilled workers will add greatly to labor quality. In the case of number 3, changes in the ratio of capital per worker and automation are involved. Moreover, the evolution in production methods which these processes represent have been underway since the beginning of the industrial revolution. While rates of improvement have been in spurts, though continuously upward, there is no sign that the end of such gains in productivity is in sight. Number 4, the change in composition, appears to be the most important factor of those listed by Bratt, which may retard or even drag down productivity in the next forty years. Agriculture, which has had the greatest increase of all in productivity during the last three or four decades, is rapidly becoming relatively unimportant in total employment. Manufacturing, the next most important source of gains in productivity,

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<sup>19/</sup>Bratt, Elmer C., Business Forecasting, McGraw-Hill, 1958, pp. 36-43.

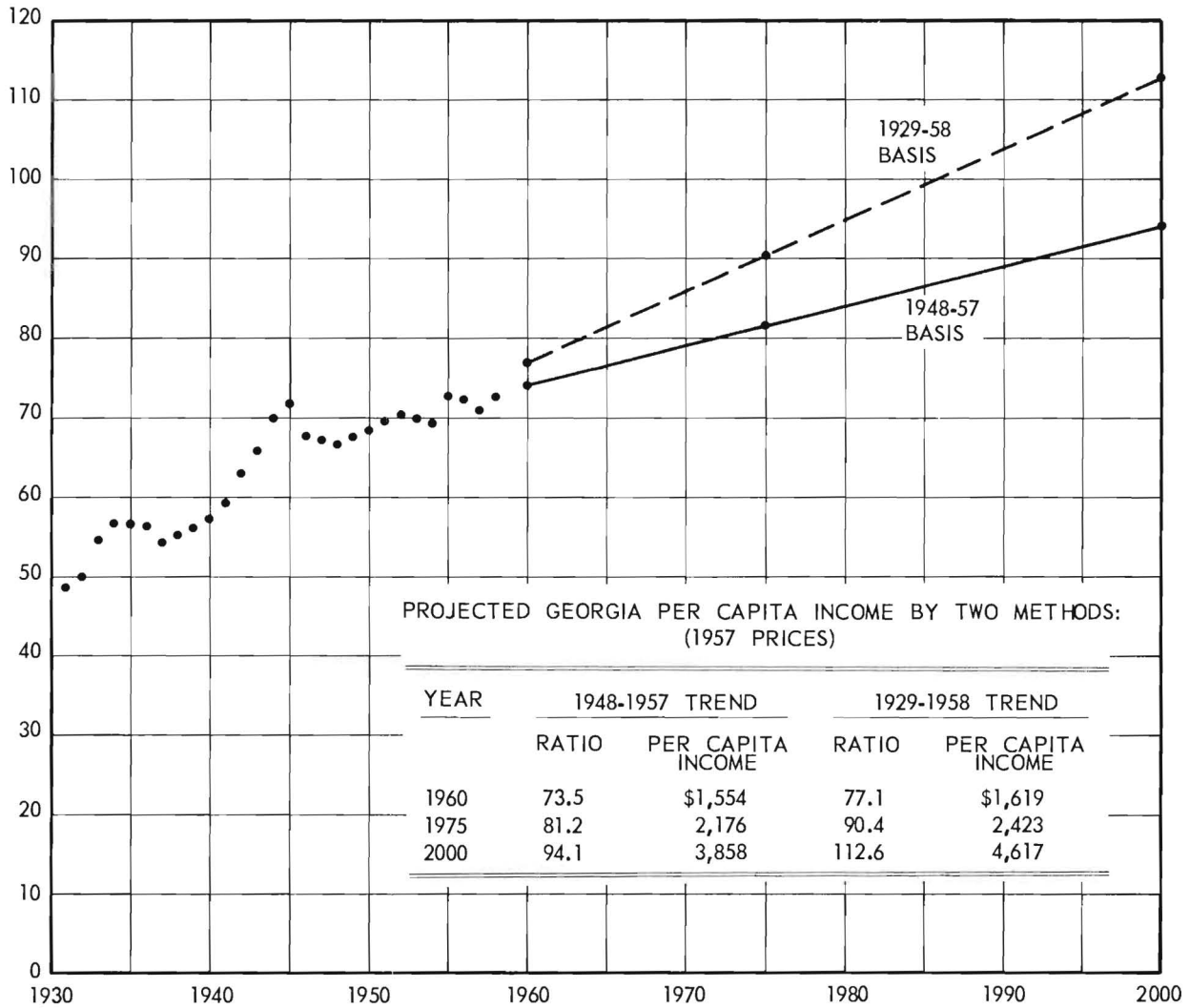
seems to be approaching a limit in its ratio to total employment. Therefore, we do not see this segment of the study area states' economy advancing beyond 27 per cent by 2000, compared to 23 per cent in 1960. Consequently the greatest income gains in the region's economy are likely to be in trade, government, and services -- areas that traditionally have shown rates of gain in productivity far below either agriculture or manufacturing. On the basis of this argument, we assume that gains of productivity in the nation and in the study area states will not be quite as rapid as they have been during the last few decades.

Per Capita Income. Population, the first major component of income, has been determined (see Table 3). The second component, trends in productivity, cannot be established accurately within the scope of this study. A fairly satisfactory substitute, trends in real per capita income, a crude measure of the productivity gains relative to the whole population, can be calculated. Historical records of total personal income, population, and price information are in published form back to 1929. These enable an estimation of changes in real per capita income without detailed investigation of original sources. Because of the crudeness of this measure of change in per capita productivity, however, its application to population to obtain projections of total personal income will produce less accurate results than if estimates of man-hour rates of productivity were available.

Chart IX illustrates a projection of Georgia's per capita income to 2000 by two methods. The first projection is based on the entire period from 1929. It is noted that the slope of the line is affected by the sharp rise in per capita income relative to the nation during the depression and World War II. Projections of these ratios to 2000 would give a per capita income 112.6 per cent above the national level. We believe the period

CHART IX  
TREND IN RATIO OF GEORGIA PER CAPITA INCOME TO U.S. PER CAPITA INCOME 1929  
TO 1958, WITH PROJECTIONS OF RATIOS BY TWO METHODS TO 1960, 1975, AND 2000

RATIO OF  
GA. p/c  
TO U.S. p/c



1930-46 is not typical, and the result is a ratio in 2000 that is unrealistic and undoubtedly not achievable.

The second projection is based on the period 1948 to 1957. This period represents a growth relationship in the absence of either a depression or a major war. It gives a ratio in per capita income relative to the nation in 2000 which is 94.1 per cent. This gives an income of \$3,858, compared to \$4,100 for the nation (see Table 15 below). It is believed that the projection, based on the period 1948-57, **infers** economic and other conditions in development which will be more typical of the period 1960 to 2000 than of the 1929-1957 period. The resulting level of per capita income (\$759 less than the first projection) is also considered reasonably achievable in the period we are looking at.

Per capita income comparisons between the U. S. per capita income and the study area states in 1957 prices, are given in Table 15. The projections are based on ratio extrapolations for the period 1948-57. The projections show the following increased in the study area states and the U. S. from 1957 to 2000 (in 1957 dollars):

<u>State</u>	<u>Per Cent Increase</u>
Alabama	190
Florida	158
Georgia	167
South Carolina	116
United States	101

TABLE 15

Trend in Per Capita Income of Study Area States  
Relative to the U. S., 1948-1957, With Projections to  
1960, 1975, and 2000

Year	U.S.	Alabama		Florida		Georgia		S. Carolina	
		Ratio	\$	Ratio	\$	Ratio	\$	Ratio	\$
1948	1661	60.3	1001	83.4	1385	66.8	1109	61.9	1028
1949	1623	58.6	956	87.0	1420	67.4	1100	60.6	989
1950	1744	58.1	1014	86.4	1506	68.2	1189	59.1	1030
1951	1787	60.0	1072	83.7	1495	69.5	1242	63.2	1130
1952	1825	60.7	1107	85.1	1553	70.1	1280	64.5	1177
1953	1880	60.4	1136	86.9	1634	69.7	1334	63.2	1189
1954	1853	60.6	1123	86.5	1603	69.1	1280	60.5	1121
1955	1958	64.5	1263	88.7	1737	72.4	1417	57.4	1124
1956	2042	64.0	1306	89.8	1834	72.1	1472	59.1	1206
1957	2043	65.1	1329	89.9	1837	70.6	1443	58.2	1188

## Projections:

1960	2115	66.4	1404	91.2	1929	73.5	1554	65.2	1379
1975	2680	76.7	2056	100.3	2688	81.2	2176	72.4	1635
2000	4100	93.9	3850	115.4	4731	94.1	3858	85.3	2567

Source: "Personal Income by States Since 1929," A Supplement to the Survey of Current Business; and the August 1959 issue of the Survey of Current Business.

The relatively more rapid rise of per capita income in the study area states and the South compared with the nation has been due primarily to the rapid increase of nonagricultural employment, both absolutely and in relation to agricultural employment. Ratios of total employment in agriculture in 1940 and 1950 are as follows by state:

	<u>1940</u>	<u>1950</u>
Alabama	39.9	24.6
Florida	18.9	13.3
Georgia	35.1	22.1
South Carolina	39.6	26.2

The ratio of total employment in agriculture has continued to decline, as the data for Georgia show. The ratio for this State declined from 22.1 per cent in 1950 to 16.9 per cent in 1955. Not only has the loss of employment in agriculture been replaced by employment in manufacturing and other nonagricultural occupations, but relative wage levels are substantially higher in all nonagricultural enterprises than in agriculture. The hourly earnings in manufacturing in Georgia, for example, are just over three times<sup>20/</sup> hourly wages for farm workers. Yet the differential tends to become larger, for the manufacturing mix itself has changed in the direction of higher wage industries, particularly in Alabama, Florida, and Georgia. Nothing shows this better than the fact that in 1940, 44 per cent of Georgia's workers in manufacturing were employed in textile mill products, while in December 1959 the percentage was down to 30 per cent. North Carolina and South Carolina have tended to maintain a high ratio of employment in textiles and apparel industries.

Other factors which have contributed to closing the per capita income gap of the study area states with the nation are a rising educational level, relative decline in the Negro population, and growth in urbanization. See Table 16. It is to be noted from this table that the three factors have improved in all the study area states in the direction of having a positive influence on per capita income. The sharpest rises in the ratio of population urban occurred in South Carolina and Georgia; the most rapid decline in population Negro, in Florida and Georgia; and comparatively rapid rises in educational levels<sup>21/</sup> occurred in Florida, Alabama, and South Carolina.

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<sup>20/</sup>Farm Labor, U. S. Department of Agricultural, January 11, 1960, p. 15, and Georgia Employment and Earnings, Georgia Department of Labor, February 26, 1960, p. 4.

<sup>21/</sup>For a more complete discussion of the income impact of these factors, see John L. Fulmer, "Factors Influencing State Per Capita Income Differentials," Southern Economic Journal, Vol. XVI (January 1950), pp. 259-278.



TABLE 16

Trends in Specified Factors from 1940 to 1950,  
Having a Bearing on the Rise in Per Capita Income

	<u>1940</u>	<u>1950</u>
Per Cent Population Urban:		
Alabama	30.2	43.8
Florida	55.1	65.5
Georgia	34.4	45.3
South Carolina	24.5	36.7
United States	56.5	64.0
Per Cent Population Negro:		
Alabama	34.7	32.0
Florida	27.1	21.7
Georgia	34.7	30.9
South Carolina	42.9	38.8
United States	10.2	10.4
Median Years of Schooling:		
Alabama	7.1	8.0
Florida	8.3	9.6
Georgia	7.1	7.8
South Carolina	6.7	7.6
United States	8.6	9.3

Source: Census of Population, 1940 and 1950.

Georgia's rise in educational level, 0.7 years of schooling from 1940 to 1950, was the same as the rise nationally. All other states in the study area exceeded the rise in the national educational level.

Assumptions Relative to the Factors Affecting Economic Development in  
Georgia

It is assumed that per capita income study area states will continue to close the gap on the U. S. per capita income at about the same rate as from 1948 to 1957. The reasons, while numerous and complex, are associated with development trends which have already been identified, such as decline in agriculture, rise in the educational level, decline in the percentage of the population Negro, and growth in urbanization. By the year 2000 Georgia will probably have only three per cent of its employment in agriculture compared to 14 per cent presently; the proportion of the population Negro, 16 per cent; and the percentage of the population living in urban centers is expected to rise to 72 per cent. The educational level will continue to rise all during the period, with greatest changes occurring in quality of education. The changes in educational level and quality not only will provide more business leaders, but also will enable people of the State to tackle and solve their economic, social, and political problems more intelligently. This will produce a better balanced and more efficient economy. The educational impact, along with large relative declines in the Negro population and striking increases both absolutely and relatively in the urban population, will cause per capita incomes to continue to expand more rapidly than in the United States as a whole.

From these factors alone we may confidently expect Georgia and the adjoining study area states to continue to close the income gap with the

nation. However, this trend will be reinforced and accelerated by a further balancing out of the economy. We believe the ratio of employment in manufacturing in the study area may not go much beyond the national ratio, or about 27 per cent of total employment. The biggest relative changes then will occur in nonmanufacturing activities -- such as construction, trade, finance and real estate, transportation, services, and government. The wage level in general of these employments will be better than some manufacturing in Georgia at the present -- such as apparel, textiles, and the food industries.

The biggest change in manufacturing will not be the moderate rise in its relative importance. The most significant change will be that the manufacturing segment of the area's economy will become better balanced, with relatively more of the high-paying industries such as chemicals, plastics, metalworking, and metal fabricating. Completely new types of industries, perhaps associated with atomic energy, may be expected. These will increase income from the manufacturing segment.

The national highway program may be expected to have relatively greater impacts in Georgia because the State is deficient in the better types of highways. More and better roads are essential to the further development of the State. Recognition of the best interests of the State's development will force its leaders to get behind a program that is so badly lagging.

The whole process of movement of people into cities and industries of a newly developing region produces further reinforcing effects. Residences must be built to accomodate the population growth which is predominately adult; and new industrial construction must be provided for the new factories and warehouses. In these new establishments, including many

factories, and some relocated factories, the latest improvements in factory design and production equipment will be incorporated. Such innovations not only provide the well known competitive advantages of greater efficiency and lower production costs, but also offer many other advantages from the standpoint of management and worker morale.

The people of the South have a higher propensity to spend than do those in other regions of the United States. Studies of the relationship of retail sales to personal income for the Census year 1954 disclosed that 67 per cent<sup>22/</sup> of income was spent at retail compared to 58 per cent for the rest of the country.<sup>23/</sup> This means that for a given investment the multiplier effects on economic expansion are substantially higher in Georgia and the other Southern states than in states outside the South. Consumption habits of Southern people are favorable to economic development. However, the fact that a higher proportion of income is spent at retail means that savings are relatively low. This limits economic development from the standpoint of local investment funds. Since capital funds are mobile and are known to be flowing to the South, it is believed that the disadvantage of a low propensity to save can be minimized. The high propensity to spend is considered far more important to economic development because of the greater multiplier effect. This factor combined with rapid expansion in the size of the Southern market, represented by continuously rising personal incomes, makes the market factor even more important in projecting economic development in Georgia and nearby states than elsewhere in the United States.

#### Methodology in Projecting Per Capita Incomes of the Southeast River Basins

The projections assume a continuation of the strong development trends discussed above, and that the ratio of segment per capita income is adequately

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<sup>22/</sup> John L. Fulmer, "South's Retail Sales Set Pace for Nation," Manufacturers' Record, April, 1958, p. 36.

<sup>23/</sup> As the South becomes more like the nation, it will also become more like the nation in the propensity to consume.

reflected by a linear relationship. The estimates of income for 1960, 1975, and 2000 were based on a linear projection of the ratio of basin per capita incomes to the State per capita income for Georgia.<sup>24/</sup> Only three yearly observations (1939, 1950, 1956) of per capita income for the basins were available.<sup>25/</sup> The 1950 data, except for Alabama, are derived from estimates in Sales Management's Survey of Buying Power for 1950. The 1939 and 1956, especially 1956, incomes are much higher quality estimates, as they were either prepared by the Conference on the Measurement of County Income or by the methods developed by it. The basin income ratio to Georgia were, therefore, based primarily on the ratio for 1939 and 1956. They were extrapolated by equation to 1960, 1975, and 2000, with adjustments for consistency with urbanization and industrialization trends in the different areas.

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<sup>24/</sup>The per capita ratios for river basins from the adjoining states were compared to Georgia per capita figures because these basins conform more nearly to nearby Georgia basins than to the state composite, of which they were a comparatively minor part in each case. Except for basins 6 and 8 in Florida, these basins have no important urban centers. They appear unrelated to the large cities which were generally quite remote from the river basins included in the Southeast River Basins study.

<sup>25/</sup>Sources of County Income Estimates:

- (1) Alabama - Marion H. Hawley, "Personal Income in Alabama Counties Since 1939. Revised Through 1957." Printed Series No. 27, Bureau of Business Research, University of Alabama, 1958.
- (2) Florida - Wylie Kilpatrick, "Personal Income in Florida," Business Research Report Number 112, University of Florida, 1958. 1939 data are from Sales Management's Survey of Buying Power, adjusted to the National Income Division's concept of personal income.
- (3) Georgia - John L. Fulmer, "Analysis of Personal Income Payments by Counties." Industrial Development Branch, Engineering Experiment Station, Georgia Institute of Technology, 1959.
- (4) North Carolina - Barclay Gibbs Jones, "Personal Income Estimates for North Carolina Counties, 1939, 1947, 1950, 1954," School of Business Administration, The University of North Carolina, 1957. Percentage adjustments were made from 1954 to the 1956 estimates of the National Income Division, U. S. Department of Commerce.
- (5) South Carolina - Basic county relationships were determined from Sales Management's Survey of Buying Power, 1940, 1951, and 1957. Adjustments were made to the official state estimates by the National Income Division by use of a ratio factor.

Trends in basin and sub-basin per capita income ratios are presented in Charts X and XI. Three sub-basins in Georgia and four in adjoining states are projected in a rising relationship to Georgia per capita income. The sub-basins in Georgia are numbers 1, 4, and 7. Sub-basins 1 and 7 have heavy concentrations of urban population. Sub-basin 4 is influenced by Jacksonville and a heavy concentration of paper mills. Among the sub-basins outside Georgia expected to gain in per capita income relative to Georgia are sub-basins 6 and 8 in Florida, which are influenced greatly by Tallahassee and Pensacola respectively. Sub-basin 7 in Alabama adjoins the greatly urbanized sub-basin 7 in Georgia. Sub-basin 1 in South Carolina is a part of Basin 1 and is of course greatly influenced by the Savannah River complex of industrial, military, and power installations.

#### Per Capita and Total Personal Income Projections

The ratios presented in Charts X and XI by sub-basins were applied directly to the State per capita income for Georgia to get projected per capita incomes for 1960, 1975, and 2000. Since the basic U. S. projections from the DELAWARE STUDY are in terms of 1957 dollars, the per capita income derived for Georgia is also in 1957 dollars. Hence the sub-basin projections are also in 1957 dollars.

The following table compares 1957 per capita income in the U. S. with that in the four states and in the study area proper, and projects per capita income in these areas to 1960, 1975, and 2000. All figures are in constant 1957 dollars.

<u>Year</u>	<u>United States</u>	<u>Alabama</u>	<u>Florida</u>	<u>Georgia</u>	<u>South Carolina</u>	<u>Basins Composite</u>
1957	\$2001	1329	1837	1443	1188	1403*
1960	2115	1404	1929	1554	1379	1493
1975	2680	2056	2688	2176	1635	2049
2000	4100	3850	4731	3858	2567	3868
*1956						

CHART X  
TREND IN GEORGIA RIVER BASIN AND SUB-BASIN PER CAPITA INCOME RATIOS TO  
GEORGIA PER CAPITA INCOME 1939, 1950, 1956, WITH PROJECTIONS TO  
1960, 1975, 2000

PER CENT OF GEORGIA  
PER CAPITA INCOME

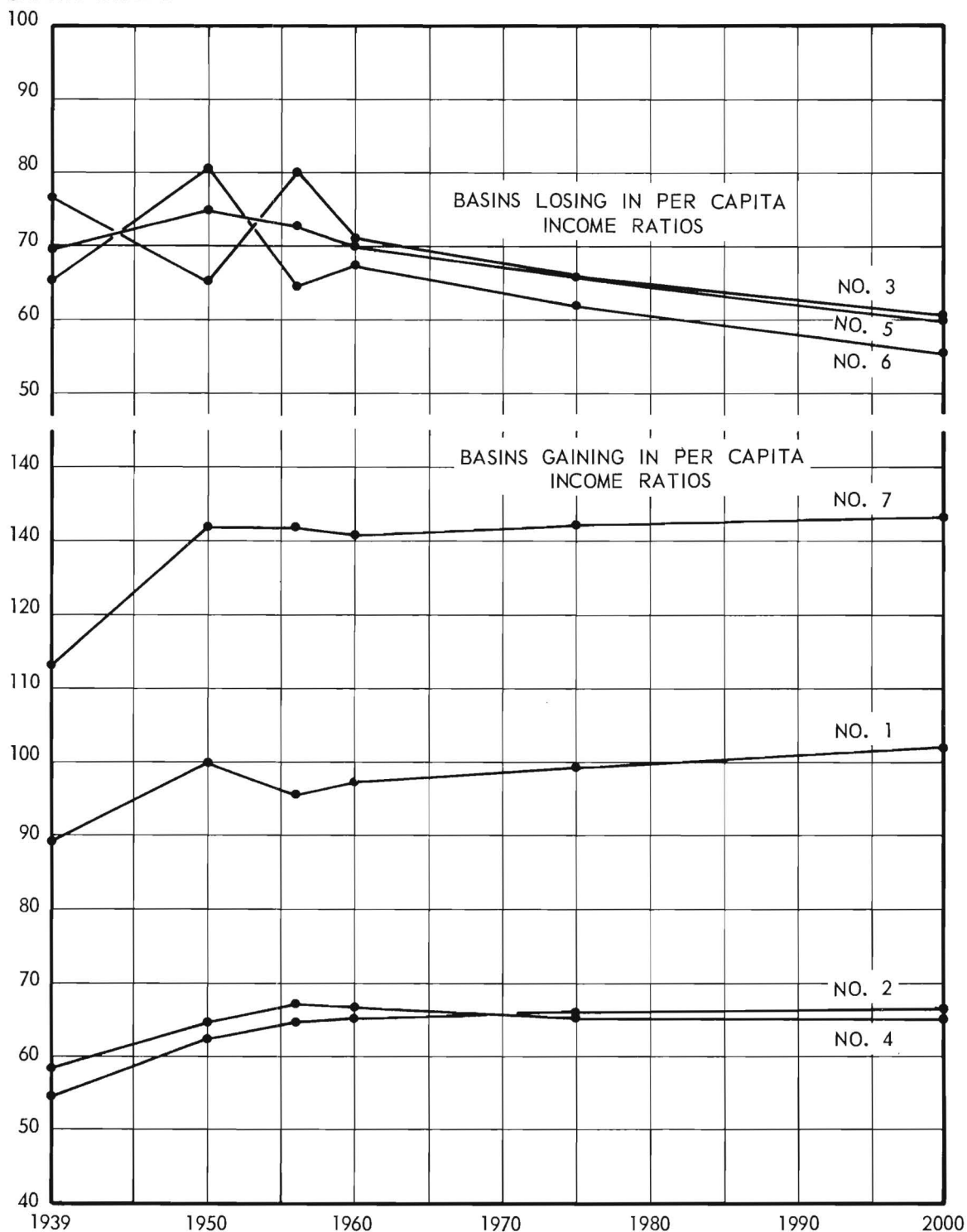
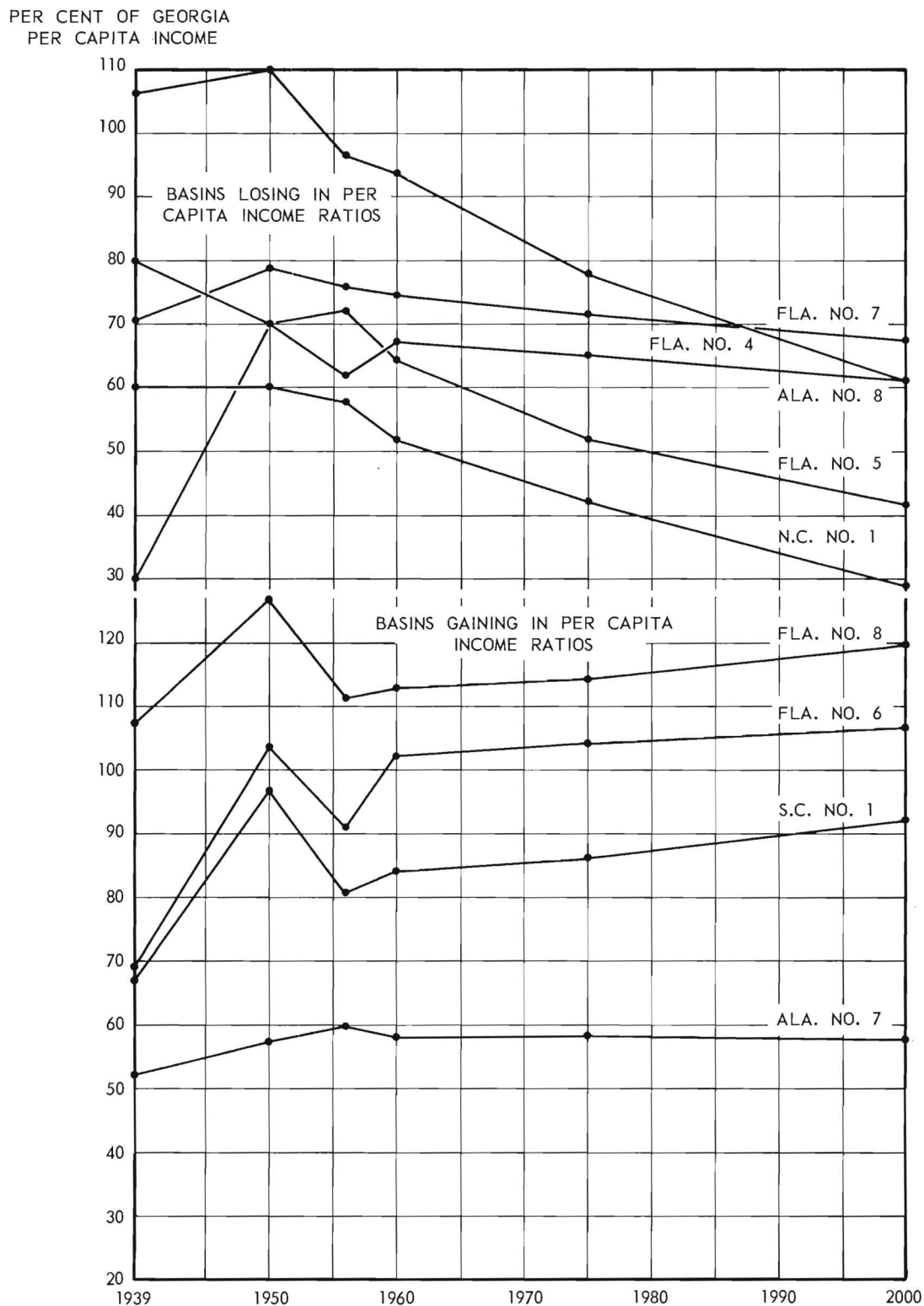


CHART XI  
TRENDS IN ALABAMA, FLORIDA, SOUTH CAROLINA, AND NORTH CAROLINA RIVER BASIN  
AND SUB-BASIN PER CAPITA INCOME RATIOS TO GEORGIA PER CAPITA INCOME  
1939, 1950, 1956, WITH PROJECTIONS TO 1960, 1975, 2000





From 1957 to 2000, the national per capita income in constant dollars is expected to increase 105 per cent; Georgia, 167 per cent; and the Southeast River Basins composite, 176 per cent. The yearly rates of growth in real per capita income compounded (a rough measure of the increase in productivity) are: nation, 1.67 per cent; Georgia, 2.31 per cent; and the Basins composite, 2.38 per cent. The growth in productivity of Georgia and the study area is thus projected at 2.31 per cent and 2.38 per cent respectively. Detailed comparisons for basins and sub-basins are given in Table 17.

Total personal income<sup>26/</sup> by basins and sub-basins in 1957 dollars for 1939, 1950, 1956, 1960, 1975, and 2000 is given in Table 18. Personal income for the nation<sup>27/</sup> was projected with a 7 per cent increase from 1957 to 1960, a 71 per cent increase from 1960 to 1975, and a 112 per cent increase from 1975 to 2000. Because of the expected further closing of the gap with the nation in per capita income, the increases for the Southeast River Basins composite is materially higher. From 1956 to 1960 the increase is expected to be 9 per cent; from 1960 to 1975, 79 per cent; and from 1975 to 2000, 198 per cent. The steady but significant growth of the study area relative to the nation is shown by the ratio of personal income of the area to the nation. In 1956 it was 1.9 per cent; in 1960 it is projected as 1.9 per cent; in 1975, 2.1 per cent; and in 2000, 2.8 per cent. These appear to be rather substantial gains, but are believed achievable under the conditions assumed, provided economic development is pursued aggressively.

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<sup>26/</sup>Total personal income for each sub-basin is a simple product of population and per capita income. Projections of population and per capita income were independently derived. See discussions above under appropriate headings.

<sup>27/</sup>Based on the DELAWARE RIVER STUDY.

TABLE 17

Per Capita Income Trends by River Basin and Sub-basin  
1939, 1950, 1956, With Projections for 1960, 1975, 2000

		(In 1957 Dollars)				
Basin and State Sub-Basin	1939	1950	1956	1960	1975	2000
Basin 1						
Georgia	558	1185	1408	1507	2154	3935
South Carolina	420	1149	1189	1305	1871	3549
North Carolina	338	717	851	860	918	1107
Total	514	1173	1328	1411	2061	3815
Basin 2						
Georgia	341	741	952	988	1412	2553
Basin 3						
Georgia	438	889	1070	1092	1431	2295
Basin 4						
Florida	671	1332	1421	1458	1693	2350
Georgia	364	767	984	1012	1416	2495
Total	416	871	1078	1101	1472	2465
Basin 5						
Florida	502	834	1070	1085	1127	1605
Georgia	482	775	1177	1237	1434	2279
Total	488	794	1145	1194	1361	2163
Basin 6						
Florida	431	1235	1340	1585	2263	4109
Georgia	408	956	951	1049	1345	2085
Total	421	1127	1180	1387	1939	3476
Basin 7						
Alabama	326	678	878	900	1260	2218
Florida	441	936	1123	1158	1558	2593
Georgia	709	1566	1935	2031	2874	5130
Total	654	1446	1810	1895	2700	4869
Basin 8						
Alabama	187	833	913	1041	1414	2353
Florida	674	1504	1635	1750	2481	4610
Total	361	1129	1263	1415	2074	4094
Summary:						
Alabama	232	781	902	992	1697	2291
Florida	556	1267	1440	1553	2192	4168
Georgia	560	1202	1489	1564	2117	3961
North Carolina	338	717	851	860	918	1107
South Carolina	420	1149	1189	1305	1871	3549
Total	512	1160	1403	1493	2050	3868

TABLE 18

Income Trends by River Basin and Sub-basin Areas 1939, 1950, 1956,  
With Projections for 1960, 1975, 2000

(In Millions of 1957 Dollars)						
Basin and State Sub-basin	1939	1950	1956	1960	1975	2000
Basin 1						
Georgia	225.9	540.5	714.4	758.5	1490.1	4431.2
North Carolina	4.0	4.7	5.9	6.4	8.4	13.7
South Carolina	93.3	265.7	318.3	309.9	535.1	1362.1
Total	323.2	810.9	1038.6	1074.8	2033.6	5807.0
Basin 2						
Georgia	53.2	103.9	124.2	132.1	175.9	282.9
Basin 3						
Georgia	314.8	700.9	902.9	941.3	1165.9	3715.4
Basin 4						
Florida	13.8	32.4	42.2	41.3	60.3	122.7
Georgia	36.6	82.2	106.1	115.3	199.4	494.0
Total	50.4	114.6	148.3	156.6	259.7	616.7
Basin 5						
Florida	44.7	75.2	92.5	103.5	115.0	183.0
Georgia	93.1	152.3	235.4	265.6	370.7	784.9
Total	137.8	227.5	327.9	369.1	485.7	967.9
Basin 6						
Florida	40.9	137.3	164.2	195.6	335.2	818.9
Georgia	28.3	67.1	81.2	75.5	108.5	188.9
Total	69.2	204.4	245.4	271.1	443.7	1007.8
Basin 7						
Alabama	50.0	109.7	128.9	146.4	256.7	653.9
Florida	24.3	53.8	65.7	69.7	100.2	195.0
Georgia	790.5	2015.2	2722.6	3087.1	6062.4	18713.7
Total	864.8	2178.7	2917.2	3303.2	6419.3	19562.6
Basin 8						
Alabama	58.5	267.6	313.7	317.8	471.1	816.0
Florida	117.2	382.3	530.0	595.9	1342.2	5397.8
Total	175.7	649.9	843.7	913.7	1813.3	6213.8
Summary:						
Alabama	108.5	377.3	442.6	464.2	727.8	1469.9
Florida	240.9	681.1	894.6	1006.0	1952.9	6717.4
Georgia	1542.4	3662.1	4886.8	5375.4	9572.9	28611.0
North Carolina	4.0	4.7	5.9	6.4	8.4	13.7
South Carolina	93.3	265.6	318.3	309.9	535.1	1362.1
Total	1989.1	4990.8	6548.2	7161.9	12797.1	38174.1

Projections of Components of Income, 1960, 1975, 2000.

The objective of this part of the chapter is to break down the aggregate income projections given in Table 18 to the main elements constituting total personal income payments. The components<sup>28/</sup> of income considered in this section are wages and salaries, agricultural income, nonfarm proprietors' income, property income, transfer payments and other labor income, and personal contributions for social insurance as a deduction.

Concepts of Components. Wages and salaries are estimates of all direct earnings by workers in all nonagricultural establishments, including all government employees, federal, state, and local, as well as persons in the armed forces. Wage payments to workers in the service industries, such as medical and health services, nonprofit membership organizations, and domestic servants are included.

Agricultural income is the sum of the estimated net income earned by farm proprietors plus wages paid farm workers.

Nonfarm proprietors' income include earnings of professional persons, such as lawyers, physicians, etc., and also earnings of owner-operated enterprises; for example small retail stores, small manufacturers, personal loan services, real estate agencies, and various other owner-operated businesses.

Property income covers both direct monetary and imputed returns to the owners of property. Monetary income takes into account rents, interest and dividends. Imputed property income represents the rental value of owner-occupied nonfarm dwellings, and imputed interest income for life insurance equities, funds in mutual savings and commercial banks, and other financial institutions.

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<sup>28/</sup>For a comprehensive discussion of the components, see "Personal Income by States since 1929," A Supplement to the Survey of Current Business, U. S. Department of Commerce, 1956, pp. 71-138.

Transfer payments and other labor income are derived by adding these two separate categories from the income accounts. Transfer payments involve payments for old age and survivors' insurance, unemployment compensation, pensions and retirement benefits, and direct relief. Other labor income is a miscellaneous category that does not fit clearly under any of the other components. It includes employer contributions to private pension and related plans, compensation for injuries, military reservists, and numerous other miscellaneous sources but not of much consequence.

Personal contributions for social insurance comprise employee contributions for old age and survivors' insurance, state unemployment compensation, and for other less common types such as railroad retirement and the retirement systems of Federal, state, and local government employees. Also self-employed persons' contributions, which include farmers and several other classes of the self-employed which have become of growing importance in recent years.

Basic Assumptions. Wages and salaries as a component of personal income have become steadily more important in the last 30 years, though the changes during World War II were erratically higher. The ratio <sup>29/</sup> of total personal income payments represented by wages and salaries was 57.2 per cent in 1929 while in 1958 the ratio was 65.1 per cent, the latter being, however, about 1.5 points below current levels of 67.0 per cent. Most of the states in the study area have had a parallel movement with the ratio for the wage and salary components of the United States, except Florida which has remained a fairly constant ratio since the war. For the projections it is assumed that the ratio of gross wages and salaries will continue the

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<sup>29/</sup> Basic historical data for component ratios were obtained from "Personal Income by States Since 1929," A Supplement to the Survey of Current Business, U. S. Department of Commerce, 1956, pp. 144-204; and August issues of the Survey of Current Business for data after 1953.

moderate rise from recent years, reaching a level in the United States of 71.3 per cent in 2000. This compares to a current level of 67 per cent approximately. The states in the study area are expected to rise proportionately from current levels.

The ratio of agricultural incomes to total personal income shows an irregular tendency to decline over time. The ratio for the U. S. rose from 6.9 per cent in 1930 to 9.5 per cent in 1945, remained around this level until 1948, after which the ratio declined sharply through 1958, the latest year for which data are available, when the ratio was 4.8 per cent. The study area states show similar trends although the ratios are higher than in the U. S. ratio and vary among each other. For instance in 1958, the agricultural income ratio for Alabama was 7.1; Florida, 5.1; Georgia, 6.6; and for South Carolina, 8.1 per cent. The rate of decline in the agricultural income ratio for the U. S. and the study area states is slackening. We assume that this will continue throughout the projected years. While the agricultural income ratio will continue to decline it will not fall as rapidly as the farm population ratio. In fact due to a pace setting rise in farm productivity, the farm income and farm population ratios are expected to be nearly equal by 2000, although at present the farm population ratio is about 60 per cent larger than the agricultural income ratio.

Nonfarm proprietors' income considered over the 30-year period rose relative to total personal income until about the end of World War II; since that time the ratio has declined in importance. Analysis of ratios of nonfarm proprietors' income for the United States and the study area states indicate that the war period was more than normally favorable for professional people and for owner-operated enterprises. However, the trend in the ratio is definitely down since the war. The ratio for the U. S. fell

from 12.1 per cent in 1956 to 9.1 in 1958; in Georgia the ratio declined from 13.0 per cent in 1946 to 9.9 in 1958, and in Florida, it declined from 14.3 to 11.5 per cent. All the other states in the study area except South Carolina have higher ratios than the United States, although with similarly declining trends. The lower ratio for the United States reflects greater maturity in economic development than for the South as a whole. Comparisons of the study area states with other states, like Illinois, which have progressed further in economic development support the point that stage of economic development has a bearing on the relative amount of income going to nonfarm proprietors. Yet evidence<sup>30/</sup> submitted by some other scholars on economic development indicates that opportunities for professional people and small enterprises grow more than proportionately with urbanization. This conclusion which is accepted as valid seems to contradict the thesis of a declining share of total personal income for nonfarm proprietors. Although evidence indicates that this category will tend to become more numerous with growth of urbanization in the region, there are logical reasons for believing that their earnings rate may not keep up with wage and salaried workers. Owner-operated businesses, particularly manufacturing are not nearly as efficiently organized and operated as the larger incorporated companies which can employ experts for every problem area. Moreover, most of the owner-operated small manufacturers, and particularly job shops in the larger centers, depend on the bigger incorporated companies as markets for a major share of output. Under these conditions the owner-operated companies are in a poor bargaining position for profitable sale of output.

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<sup>30/</sup> See particularly P. Sargent Florence, "Economic Efficiency in the Metropolis," The Metropolis in Modern Life (edited by Robert Moore Fisher), Doubleday and Company, New York, 1955, pp. 96-97.

We believe that professional classes in this category are an exception. Although they do not have the power of labor unions to keep wages and salaries rising, doctors in particular and perhaps some other professional classes depend upon the level of wages and salaries in the area for market demand for their services. It is believed that this demand for professional services will increase proportionately with the rise in wages and salaries and other increases of personal income.

Nevertheless, despite these two contrary tendencies in this category of income it is assumed for the purposes of the projections that the ratio of total personal income going to nonfarm proprietors will continue the downward trend evident since the war. Current differentials between states are expected to be maintained, although at a lower level than currently.

The ratio of property income to total personal income in the United States fell precipitously from 22.4 per cent in 1930 to 10.1 per cent in 1944; since 1944, the ratio has advanced moderately to 12.5 per cent. The property income ratios for the study area states show the same trend, but the ratio level is considerably lower than the U. S. ratio except in Florida. This is contrary to nonfarm proprietors' income ratios, which were higher than the national level. The fact that the more mature economies of the United States and rural states of the Midwest are higher than the study area states indicates that we may expect the proportion of total income going to property holders to rise significantly by the year 2000. The trend line for these property income ratios indicates that in the United States it may rise from 12.2 per cent currently to 14 per cent in 2000; Alabama from 8.6 to 9.8; Florida from 16.4 to 18.6; Georgia from 9.6 to 10.9; and South Carolina from 9.2 to 11.3.



The reason that a rising property income ratio relative to total personal income may be expected is that the expected growth of urban population will place rising emphasis on location of property and structures already in place, and even those constructed which will lag the rate of expansion in market demand. Florida's high ratio for the study area states reflects already the pressure for choice space on the part of the numerous small businesses in Florida, and on the part of migrants for homes. We see no development likely to reverse this trend; in fact, accelerating population growth pressing against space is likely to magnify the rising trend.

Transfer payments and other labor income in 1957 were composed of 70 per cent transfer payments and 30 per cent other labor income. After a long period of declining importance, other labor income has increased greatly in significance since 1950. The primary component of other labor income is employers' contributions to private pensions and welfare funds. Its rise in importance in recent years is due to increased interest on the part of labor unions for larger pension and fringe benefits in labor contracts. From 1930 to after World War II, the ratio to total personal income of transfer payments and other labor income varied between 4 and 5 per cent in the United States. Since 1946, when the ratio was 7.5 per cent, it has steadily increased to about 10 per cent at present. Trends in the ratio for the study area states parallel national trends, although all of the states in the area except Alabama had a lower ratio than the national average. The lower range for most of the study area states is due to provisions of the social security system which permit variation in the level of unemployment compensation somewhat according to enactment by state legislatures. This is true also of the old-age assistance and public welfare; the scale of

payments may vary by states. Social security retirement benefits, the major part of this component, is standard throughout the nation according to scale of payments. Relative to the projections, it is assumed that the tendency of the share of social security payments to rise over time will be continued. It is believed that this assumption is realistic because of continuous public pressure to broaden social security coverage and to liberalize its provisions.

The ratio of personal contributions for social insurance shows the most consistent rise of any of the ratios studied thus far. In 1935, when the social security legislation was enacted, the percentage of total personal income contributed for social insurance in the United States was 0.3 per cent; in 1937, when the new legislation went into effect, it was 0.8 per cent. During the next four years the ratio remained constant, but since 1941, it has risen almost every year until 1958 when it reached a ratio of 1.9 per cent. Since the deductions are based on the national act, the ratios of personal contributions for social insurance are almost a perfect function of the national trends.

In making the projections it is assumed that the rising trend in the ratio will be maintained. In transfer payments above, the assumption was that the public is going to keep up pressure for a broader coverage and more liberal provisions in social security, including medical aid for the aged. This liberalized program must be paid for by both employees and employers. The assumption that the ratio of total personal income required to meet personal contributions for social insurance will be enlarged over time is consistent with the assumption that the ratio represented by transfer payments will be enlarged also. In fact both are mutually necessary.

For purposes of the projections it is assumed that the ratio of personal contributions for social insurance will rise from about 1.9 per cent in 1958 to 4.0 per cent in the year 2000.

Methodology. 1. The assumptions as to ratios of the different components to personal income, given above, established the basis for estimating income components for the states in the study area for 1960, 1975, and 2000. State total personal income was projected by using the product of the per capita incomes in Table 15 to the corresponding population projections for the respective states, with the basic projections of population and personal income in the DELAWARE STUDY accepted as the national benchmarks.

2. The segments in the study area for the different components were determined by the corresponding segment ratios for 1956, with adjustments for any expected rise or decline in the segments' relative importance to 2000. This provided the control total for the sub-basin allocations in each state.

The agricultural income segment totals were developed somewhat differently. First, the agricultural income per capita over a period of years in the past was established. Second, this was expressed as a ratio to state per capita income. Third, this ratio was projected as a rising function to total state per capita income. Fourth, the farm income per capita ratios were applied to the projected per capita incomes in Table 15. Fifth, the result was applied to farm population projections for the state. Sixth, state segments were determined as for the other components.

3. The methodology employed in allocating the study area segments of states to sub-basins involved three different procedures. Wages and salaries and agricultural income were allocated by using 1956 per capita incomes by sub-basins for the two different components as a benchmark.

For each of the projection years this benchmark was adjusted up by the same percentage as the rise in per capita income of each sub-basin. The adjusted component per capita income for each sub-basin was multiplied by the corresponding population for 1960, 1975, and 2000. The total which resulted for all sub-basins in each state was then adjusted to the segment control total.

The procedure for nonfarm proprietors' income, property income, and transfer payments and other labor income employed the percentage of total personal income in 1956 for each component as a benchmark. This benchmark was adjusted for each of the projected years by a ratio relationship of the 1960, 1975, or 2000 ratio for the state projected percentage to the actual 1956 state percentage for each component. The sub-basin component ratios were adjusted by the ratio derived above. The adjusted component ratios thus derived for each sub-basin were then applied to the total personal income projected for each sub-basin. The products were added to get segment totals for each state. The result was compared to the segment control for each component, and an adjusting ratio derived, which was applied to the sub-basin estimates to bring them in line with the segment control.

In the case of personal contributions for social insurance, the ratio to personal income for each state, so well established as previously indicated, was applied directly to total personal incomes projected for each sub-basin for 1960, 1975, and 2000.

4. The five components thus derived for each sub-basin plus personal contributions for social insurance (a deduction) were then compared for each projection year to the corresponding total personal income in Table 18, the control.<sup>31/</sup> The total of the different income components for each

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<sup>31/</sup> Derived by multiplying projected per capita incomes (1957 prices) by sub-basins onto the corresponding projected populations.

sub-basin derived by the method described above was adjusted to the sub-basin control for total personal income. The results agree, in all the totals, with the total personal income given in Table 18, and become the official estimates of personal income components for 1960, 1975, and 2000, given in Tables 19, 20, and 21 respectively.

Summary of Findings. The detailed values for sub-basins, basins, and state segments are presented in Table 19 for 1960; Table 20 for 1975; and Table 21 for the year 2000. The total personal income estimated (in dollars of 1957 constant purchasing power) is projected from approximately 7.2 billion dollars in 1960, to 38.2 billion dollars in the year 2000. The projected increase during the 40-year period amounts to 31.0 billion dollars. The contribution of the different income components to this large expected gain in income is as follows: wage and salaries, exclusive of wages paid to farm labor, 70 per cent; transfer payments and other labor income, almost 13 per cent. Other income components are shown in Table 22. It is noted that agricultural income will contribute less than 2 per cent of the total gain, while contributions for social insurance will amount to nearly 5 per cent of the total income gain. This item is deducted from the other components shown but mostly from wage and salary incomes. The total percentage income gain during the 40-year period is over 400 per cent; however, some of the gains in income components are relatively lower than the gain in overall personal income. The largest gain among direct income components is expected to develop in transfer payments and other labor income, which will gain at a rate 29 per cent higher than total personal income. The gains in property income and wages and salaries are next largest. Note that the gain in agricultural income is barely more than a fourth as large as the overall rate of gain. This is because of the expected large retrenchments in farm population and employment, the impacts of which, however, will be

TABLE 19

Estimated Components of Personal Income by Basins and Sub-basins  
Of the Study Area, 1960

(In Millions of 1957 Dollars)

Basin and State Sub-basin	Nonfarm Wages and Salaries	Agricultural Income	Nonfarm Proprietors' Income	Property Income	Transfer Payments and Other Income	Total	Less: Payments for Social Insurance	Total Personal Income Payments
Basin 1								
Georgia	511.4	28.2	77.7	76.0	79.9	773.2	14.7	758.5
North Carolina	3.7	0.3	0.7	0.6	1.2	6.5	0.1	6.4
South Carolina	183.3	30.8	39.5	31.7	30.0	315.3	5.4	309.9
Total	698.4	59.3	117.9	108.3	111.1	1095.0	20.2	1074.8
Basin 2								
Georgia	64.5	25.6	14.0	11.9	18.7	134.7	2.6	132.1
Basin 3								
Georgia	589.2	85.6	80.5	86.0	118.9	960.2	18.9	941.3
Basin 4								
Florida	24.6	4.6	4.1	5.1	3.7	42.1	0.8	41.3
Georgia	58.2	21.6	12.2	10.4	15.3	117.7	2.4	115.3
Total	82.8	26.2	16.3	15.5	19.0	159.8	3.2	156.6
Basin 5								
Florida	40.5	13.1	20.7	15.6	15.5	105.4	1.9	103.5
Georgia	130.4	51.5	28.5	27.1	34.2	271.7	6.1	265.6
Total	170.9	64.6	49.2	42.7	49.7	377.1	8.0	369.1
Basin 6								
Florida	112.8	16.1	21.5	27.4	21.2	199.0	3.4	195.6
Georgia	36.0	18.0	6.3	6.4	10.2	76.9	1.4	75.5
Total	148.8	34.1	27.8	33.8	31.4	275.9	4.8	271.1
Basin 7								
Alabama	86.5	19.0	12.8	12.9	18.6	149.8	3.4	146.4
Florida	32.7	6.5	13.0	9.5	9.2	70.9	1.2	69.7
Georgia	2198.2	104.6	310.2	303.7	235.5	3152.2	65.1	3087.1
Total	2317.4	130.1	336.0	326.1	263.3	3372.9	69.7	3303.2
Basin 8								
Alabama	172.4	51.2	32.0	26.6	41.8	324.0	6.2	317.8
Florida	420.5	17.6	35.2	81.3	51.9	606.5	10.6	595.9
Total	592.9	68.8	67.2	107.9	93.7	930.5	16.8	913.7
Summary:								
Alabama	258.9	70.2	44.8	39.5	60.4	473.8	9.6	464.2
Florida	631.1	57.9	94.5	138.9	101.5	1023.9	17.9	1006.0
Georgia	3587.9	335.1	529.4	521.5	512.7	5486.6	111.2	5375.4
North Carolina	3.7	0.3	0.7	0.6	1.2	6.5	0.1	6.4
South Carolina	183.3	30.8	39.5	31.7	30.0	315.3	5.4	309.9
Total	4664.9	494.3	708.9	732.2	705.8	7306.1	144.2	7161.9

Source: Basic data from "Personal Income by States Since 1929," A Supplement to the Survey of Current Business, U. S. Department of Commerce, 1956, pp. 144-204; the August 1959 issue of the Survey of Current Business for data after 1954. The basic control totals are from Table 18, this report.

TABLE 20

Estimated Components of Personal Income by Basins and Sub-basins  
of the Study Area, 1975

(In Millions of 1957 Dollars)

Basin and State Sub-basin	Nonfarm Wages and Salaries	Agricultural Income	Nonfarm Proprietors' Income	Property Income	Transfer Payments and Other Income	Total	Less: Payments for Social Insurance	Total Personal Income Payments
Basin 1								
Georgia	1029.0	38.1	143.9	149.2	172.8	1533.0	42.9	1490.1
North Carolina	5.2	0.3	0.7	0.8	1.6	8.6	0.2	8.4
South Carolina	340.0	32.4	63.2	58.9	54.3	548.8	13.7	535.1
Total	1374.2	70.8	207.8	208.9	228.7	2090.4	56.8	2033.6
Basin 2								
Georgia	84.9	34.6	17.5	15.9	27.8	180.7	4.8	175.9
Basin 3								
Georgia	802.3	82.2	79.5	90.6	137.8	1192.4	26.5	1165.9
Basin 4								
Florida	35.0	6.2	6.3	8.0	6.2	61.7	1.4	60.3
Georgia	105.8	29.6	20.7	18.6	30.3	205.0	5.6	199.4
Total	140.8	35.8	27.0	26.6	36.5	266.7	7.0	259.7
Basin 5								
Florida	46.0	12.7	23.2	17.5	18.4	117.8	2.8	115.0
Georgia	179.1	58.4	42.9	43.1	59.9	383.4	12.7	370.7
Total	225.1	71.1	66.1	60.6	78.3	501.2	15.5	485.7
Basin 6								
Florida	191.8	23.1	38.6	49.3	40.4	343.2	8.0	335.2
Georgia	54.3	21.1	9.4	9.5	16.8	111.1	2.6	108.5
Total	246.1	44.2	48.0	58.8	57.2	454.3	10.6	443.7
Basin 7								
Alabama	157.3	24.5	22.0	23.6	36.1	263.5	6.8	256.7
Florida	46.2	9.2	19.1	13.9	14.3	102.7	2.5	100.2
Georgia	4300.7	141.5	598.6	648.4	557.3	6246.5	184.1	6062.4
Total	4504.2	175.2	639.7	685.9	607.7	6612.7	193.4	6419.3
Basin 8								
Alabama	262.8	64.3	45.5	41.4	67.7	481.7	10.6	471.1
Florida	935.2	26.3	84.7	196.3	132.1	1374.6	32.4	1342.2
Total	1198.0	90.6	130.2	237.7	199.8	1856.3	43.0	1813.3
Summary:								
Alabama	420.1	88.8	67.5	65.0	103.8	745.2	17.4	727.8
Florida	1254.2	77.5	171.9	285.0	211.4	2000.0	47.1	1952.9
Georgia	6556.1	405.5	912.5	975.3	1002.7	9852.1	279.2	9572.9
North Carolina	5.2	0.3	0.7	0.8	1.6	8.6	0.2	8.4
South Carolina	340.0	32.4	63.2	58.9	54.3	548.8	13.7	535.1
Total	8575.6	604.5	1215.8	1385.0	1373.8	13154.7	357.6	12797.1

Source: Ibid., Table 19.

TABLE 21

Estimated Components of Personal Income by Basins and Sub-basins  
of the Study Area, 2000

(In Millions of 1957 Dollars)

Basin and State Sub-basin	Nonfarm Wages and Salaries	Agricultural Income	Nonfarm Proprietors' Income	Property Income	Transfer Payments and Other Income	Total	Less: Payments for Social Insurance	Total Personal Income Payments
Basin 1								
Georgia	3152.6	71.4	367.8	461.1	574.9	4627.8	196.6	4431.2
North Carolina	8.6	0.3	0.9	1.5	2.8	14.1	0.4	13.7
South Carolina	878.0	60.0	147.2	172.6	155.7	1413.5	51.4	1362.1
Total	4039.2	131.7	515.9	635.2	733.4	6055.4	248.4	5807.0
Basin 2								
Georgia	134.6	61.2	23.7	26.2	48.8	294.5	11.6	282.9
Basin 3								
Georgia	2497.8	169.9	272.2	321.6	616.7	3878.2	162.8	3715.4
Basin 4								
Florida	71.2	10.9	13.6	16.8	14.8	127.3	4.6	122.7
Georgia	284.6	54.8	43.8	48.4	83.7	515.3	21.3	494.0
Total	355.8	65.7	57.4	65.2	98.5	642.6	25.9	616.7
Basin 5								
Florida	73.1	20.2	36.6	27.2	32.4	189.5	6.5	183.0
Georgia	376.7	91.5	90.0	109.5	164.8	832.5	47.6	784.9
Total	449.8	111.7	126.6	136.7	197.2	1022.0	54.1	967.9
Basin 6								
Florida	473.5	39.4	99.1	122.3	115.0	849.3	30.4	818.9
Georgia	101.1	32.3	13.3	17.1	32.4	196.2	7.3	188.9
Total	574.6	71.7	112.4	139.4	147.4	1045.5	37.7	1007.8
Basin 7								
Alabama	414.1	38.0	52.1	63.7	103.2	671.1	17.2	653.9
Florida	91.9	15.5	37.0	26.5	30.9	201.8	6.8	195.0
Georgia	13670.1	248.4	1662.3	2099.9	1911.3	19592.0	878.3	18713.7
Total	14176.1	301.9	1751.4	2190.1	2045.4	20464.9	902.3	19562.6
Basin 8								
Alabama	461.2	93.5	73.7	74.6	131.0	834.0	18.0	816.0
Florida	3742.0	54.9	362.7	816.8	626.2	5602.6	204.8	5397.8
Total	4203.2	148.4	436.4	891.4	757.2	6436.6	222.8	6213.8
Summary:								
Alabama	875.3	131.5	125.8	138.3	234.2	1505.1	35.2	1469.9
Florida	4451.7	140.9	549.0	1009.6	819.3	6970.5	253.1	6717.4
Georgia	20217.5	729.5	2473.1	3083.8	3432.6	29936.5	1325.5	28611.0
North Carolina	8.6	0.3	0.9	1.5	2.8	14.1	0.4	13.7
South Carolina	878.0	60.0	147.2	172.6	155.7	1413.5	51.4	1362.1
Total	26431.1	1062.2	3296.0	4405.8	4644.6	39839.7	1665.6	38174.1

Source: Ibid., Table 19.



TABLE 22

Trends in Components of Personal Income  
for Total Study Area, 1960 to 2000

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(In Millions of 1957 dollars)

Income Components	1960 Income	Increase to the year 2000	Percentage Increase from 1960 to 2000
<hr/>			
Wages and Salaries	4664.9	21766.2	467.0
Agricultural Income	494.3	567.9	115.0
Nonfarm Proprietors' Income	708.9	2587.1	365.0
Property Income	732.2	3673.6	502.0
Transfer Payments and Other Income	705.8	3938.8	558.0
<hr/>			
Total	7306.1	32533.6	445.0
Less: Contributions for Social Insurance	144.2	1521.4	1055.0
<hr/>			
Net Total Personal Income	7161.9	31012.2	433.0

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Source: Tables 19 and 21.

offset to a considerable extent by the expected continuing large gains in farm productivity.

The relatively large gains in wages and salaries, both in dollars of 1957 constant purchasing power and relative to other components, is a factor of great market consequence. Wage and salaried workers enter markets more quickly and completely than other classes of income recipients for basic living necessities, housing, automobiles and other consumer durables.

The expected gains in wages and salaries by basins during the 40-year period are as follow: Basin 1, 478 per cent; Basin 2, 109 per cent; Basin 3, 324 per cent; Basin 4, 330 per cent; Basin 5, 163 per cent; Basin 6, 286 per cent; Basin 7, 341 per cent; and Basin 8, 609 per cent. The relatively rapidly growing basins are quickly identified from the comparatively large increases in wages and salaries of Basins 1, 7, and 8.

The trends in the ratios of income components from 1940 to 1950 and the projected ratios to the year 2000 are given in Table 23. The data show that the ratio of total personal income represented by wages and salaries is expected to rise from 59.0 per cent in 1950, to 69.2 per cent in 2000. However, since personal contributions for social insurance are expected to rise from 1.4 per cent of total personal income in 1950, to 4.3 per cent in 2000, the gain of nearly 10 points by wages and salaries during the period will be reduced to 6 or 7 points by increased amounts of personal taxes for social insurance that must be absorbed by wage and salary workers.

According to the projections, the proportion of personal income represented by agricultural income will probably decline from 11.7 per cent in 1950 to 2.8 per cent in 2000. This seems a rather sharp decline, yet it has been noted that agricultural employment is expected to decline from 346,400 in 1950 to 122,500 in 2000. Because of the assumed rise of

TABLE 23

Trends in Ratios of Income Components for Study Area  
1940 to 2000

Income Components	Percentage of Total Personal Income				
	1940	1950	1960	1975	2000
Wages and Salaries	57.3	59.0	65.1	67.1	69.2
Agricultural Income	15.7	11.7	6.9	4.7	2.8
Nonfarm Proprietors' Income	11.8	10.5	9.9	9.5	8.6
Property Income	11.4	10.0	10.2	10.8	11.5
Transfer Payments and Other Labor Income	4.4	10.2	9.9	10.7	12.2
Total	100.6	101.4	102.0	102.8	104.3
Less: Personal Contributions for Social Insurance	0.6	1.4	2.0	2.8	4.3
Net Total Personal Income	100.0	100.0	100.0	100.0	100.0

Source: Ibid., Table 19.

productivity in agriculture, total agricultural income (in constant 1957 dollars) is expected to more than double. Hence one third as many workers with double the income will be immeasurably better off in 2000 than in 1950, or even 1960.

The ratio for nonfarm proprietors' income shows a decline, while the ratios for property income and transfer payments and other labor income are expected to gain relative to total personal income, in accord with the assumptions. Note that the ratio of total personal income represented by personal contributions for social insurance will probably more than double in importance in the next 40 years. This expected change is consistent with the idea that the trend of the times is for broader social security coverage, more liberal provisions, and newer areas of benefits, as in medical insurance for the aged.

Trends in the ratios of income components for the three most rapidly growing basins in the study area are presented in Table 24. The three basins (numbers 1, 7, and 8) had 64 per cent of the study area's population in 1950; 73 per cent of the income; and 72 per cent of the wages and salaries. By the year 2000, however, they will probably have 72 per cent of the study area's population; 83 per cent of the total personal income payments, and 85 per cent of the wages and salaries. The concentration of urbanized centers in 1950 with an expected further concentration as a result of acceleration in recent trends in this direction, will place comparatively larger emphasis on the wages and salaries component. Basin 7 dominates the wages and salaries component. This basin according to the projections should have approximately 41 per cent of the study area's population by the year 2000; 51 per cent of the income; and 54 per cent of the study area's wages

TABLE 24

Trends in Ratio of Income Components for Selected Basins  
1960, 1975, and 2000

Basin and Income Component	Percentage of Total Personal Income		
	1960	1975	2000
Basin 1			
Wages and Salaries <sup>1</sup>	65.0	67.6	69.6
Agricultural Income <sup>2</sup>	5.5	3.5	2.3
Nonfarm Proprietors' Income	11.0	10.2	8.9
Property Income	10.1	10.3	10.9
Transfer Payments and Other Income	10.3	11.2	12.6
Total	101.9	102.8	104.3
Less: Contributions for Social Insurance	1.9	2.8	4.3
Net Total Personal Income	100.0	100.0	100.0
Basin 7			
Wages and Salaries	70.2	70.2	72.4
Agricultural Income	3.9	2.7	1.5
Nonfarm Proprietors' Income	10.2	10.0	9.0
Property Income	9.8	10.6	11.2
Transfer Payment and Other Income	8.0	9.5	10.5
Total	102.1	103.0	104.6
Less: Contributions for Social Insurance	2.1	3.0	4.6
Net Total Personal Income	100.0	100.0	100.0
Basin 8			
Wages and Salaries	64.8	66.1	67.7
Agricultural Income	7.5	5.0	2.4
Nonfarm Proprietors' Income	7.4	7.2	7.0
Property Income	11.8	13.1	14.3
Transfer Payments and Other Income	10.3	11.0	12.2
Total	101.8	102.4	103.6
Less: Contributions for Social Insurance	1.8	2.4	3.6
Net Total Personal Income	100.0	100.0	100.0

1. Excludes Farm wages.

2. Farm proprietors' income plus farm wages.

Source: Tables 19, 20, and 21.

and salaries. Basin 7 contains Atlanta, Columbus, and Albany, and is dominated more by the forces of urbanization than any other basin in the study area.

In Basins 1 and 7 agricultural income is comparatively less than in the study area as a whole; it is slightly higher in Basin 8. This is not so much because agriculture is expected to become unimportant in Basin 7 in particular, especially around Albany, but because of the overwhelmingly rapid growth of the manufacturing and the <sup>32/</sup>NANM segments of the economy. Nonfarm proprietors' income, while declining in accord with the assumptions, is higher than the overall increase in Basin 1, about average in Basin 7, and substantially lower than average for the study area in Basin 8. Basin 8 has been low historically in the relative importance of nonfarm proprietors. Instead this region has an economic organization which reflects more the influence of property owners, and retired persons shown by ratios for these two income components which are materially higher than either Basins 1 and 7, or the study area ratios.

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<sup>32/</sup>The abbreviation for nonagricultural-nonmanufacturing employment.

Population

The significant difference between population growth in the study area states and the nation is due; first, to a natural rate of increase that is substantially higher than for the nation, ranging up to 30 per cent higher in the case of Georgia; and, secondly, to a declining rate of migration loss. But the difference in natural rate of increase is mainly due to the Negro population, with the rural farm Negro population the highest of all. Even assuming birth and death rates of the period 1950-1955, the natural rate of increase which can be expected in future years will be a result of combining the rates for population components, that is urban and rural white, and urban and rural nonwhite. With the expected growth in urban population and decline in the relative importance of nonwhite population in both urban and rural locations, the natural rate of increase that results will tend to decline over time, although remaining above the national rate.

Trends in the ratio of migration loss to natural increase indicate that, beginning about 1980, these states may be expected to reverse migration trends, with some net in-movement of migration occurring in the period 1980-2000.

Another basic assumption in preparing population projections for states is that the full employment policy, embodied in the 1946 Act will be firmly adhered to. If this policy is rejected, and widespread unemployment occurs at intervals as it did in the 1930's, the birth rates calculated from trends in population components, as assumed above, would be significantly lower.

Under the above assumptions, population projections for the study area states were determined. These estimates were broken down to state segments and sub-basin totals for the study area by historical extrapolation from the period 1930 to 1956. The sub-basin ratios to total state population were adjusted for consistency with resource and development trends in the different sub-basins. The projected ratios thus derived were applied to state populations projected for 1960, 1975, and 2000.

The population projections, obtained with the above assumptions and methods, for the entire study area are as follows: 4,794,000 in 1960, 6,223,000 in 1975, and 9,786,000 in 2000. For the most rapidly growing basins (1, 7, 8) total population is expected to increase from 3,150,000 in 1960 to 7,058,000 in the year 2000. The ratio to the study area totals of these three basins is 66 per cent for 1960 and 72 per cent in the year 2000. Basin 7 alone is projected for 36 and 41 per cent respectively of the study area total population.

In the case of population components, the projections indicate that rural farm population will decline from 1,033,000 in 1960 to 645,000 in 2000; rural nonfarm population, an increase from 1,446,000 in 1960 to 2,515,000 in 2000; and urban population (in city areas), an impressive increase from 2,316,000 in 1960 to 6,627,000 in 2000. The composite population of eight major city areas in the study area (Atlanta, Savannah, Augusta, Columbus, Macon, Albany, Tallahassee, and Pensacola) are expected to increase from 2,132,000 in 1960 to 5,217,000 in 2000, representing 44 and 53 per cent of the study area total population in 1960 and 2000 respectively.

#### Labor Force and Employment

Participation of the population in the labor force depends upon the generally recognized factors of age, sex, and location. There is little



participation below age 18 or above age 65. The male participation is more than double the female participation rate, but females have a rising rate of participation. The urban population has a substantially higher participation than the farm population, especially among females. But substantial shifts of the economy from rural farm to urban may be expected to increase the participation ratio, though high birth rates since 1945 have skewed the age distribution of the population toward the younger and unemployable classes. Earlier retirement is another factor. However, by 1975, the comparatively larger numbers in the working ages may be largely offset by the larger number of aged in the population.

Because of the great shift in the economy from rural to urban dominated areas, analysis indicates that the primary factors in labor force participation may be the proportion of the population urban and rural farm at the two projection dates. The percentage population urban has a positive relationship to the percentage participation of the population in the labor force, while the per cent rural farm has a negative effect. Regression relationships based on these two factors were employed to predict the ratio of the population in the labor force in each sub-basin. The same factors and same procedures were employed to predict the unemployment ratios of sub-basins. Application of the ratios thus predicted to population previously projected by sub-basins provided projections of labor force and unemployment in each part of the study area. The difference between labor force and unemployment gave the projected employment by sub-basins.

The projected employment for the study area in 1960 is 1,790,000 workers (compared to 1,593,000 in 1950); in the year 2000 the projected employment is 3,807,000. For the rapidly growing Basins 1, 7, and 8, projected employment for 1960 is 1,186,000 workers, or 66 per cent of the

study area total; in 2000 the three basins are expected to account for 72 per cent of the area's total employment, or 2,754,000 workers.

Breakdown of employment to three major categories, and the following projected values, comparing 1960 with 2000: agricultural employment a decline from 198,100 in 1960 to 122,000 workers in 2000; manufacturing, an increase from 411,200 employees in 1960 to 986,400 in 2000; and the largest increase of all in nonagricultural-nonmanufacturing employment, from 1,181,200 workers in 1960 to 2,698,000 in the year 2000.

#### Personal Income Payments

It is assumed that the rising level of per capita income over the past several decades, reflecting the rise in productivity, will continue in the future, although at a somewhat less rapid rate of rise, because of an accelerated trend in the industrial mix toward those occupations which have comparatively less efficiency. A second basic assumption is that the study area states' per capita income will continue to rise relative to the national per capita income but at the slower trend rate from 1948 to 1957 rather than the much faster rate of the 1929-1957 period.

The reason the study area states' per capita income is expected to continue to rise relative to the nation, as in the recent past, is because the basic changes in the region's rural-urban culture and industrial composition are still in process of strong adjustment which will not be completed for several decades in the future. The trends which have been identified as factors of great importance in lowering the per capita income differentials with the nation are change in the industrial mix toward relatively less low paying agriculture and textile manufacturers; rise in the educational level, reflecting continued gain in the region's ability to forge ahead from business leadership; decline in percentage of the population

Negro, representing the steady drop in racial unrest; and the growth in urbanization reflecting a complex of factors favorable to rapid economic growth, such as concentration of entrepreneurial types of persons, intra-firm external economies, and conditions favorable to organization of economic enterprises.

The projection methodology involved three steps. First, projection of state per capita income by methods explained above. Second, a projection of sub-basin per capita income as a ratio to state per capita income, based on historical and economic relationships between 1939 and 1956. Third, multiplication of sub-basin per capita income ratios by the state per capita income. The fourth and final step involved taking the product of sub-basin per capita income and population. The results are the projected personal incomes for 1960, 1975, and 2000.

Comparisons of projections show that total personal income will probably reach a level (in constant 1957 dollars) of 7,162 million dollars in 1960 (in 1950 it was 4,991 million dollars), to 38,174 million dollars in 2000, or forty years later. Basins 1, 7, and 8, rapidly growing areas of special interest, are expected to represent 74 and 83 per cents of the study area totals in 1960 and 2000 respectively; Basin 7, 46 and 51 per cent.

Wages and salaries are projected for a rise (in 1957 dollars) from 4,665 million dollars in 1960 to 26,431 million dollars in 2000, an increase of 467 per cent; while the rise in agricultural income is from 494 million dollars to 1,062 million dollars, or 115 per cent increase.

### Conclusions

The conclusion is that a healthy expansion in the study area's economy during the next 40 years is anticipated, with 85 per cent of the growth expected to be concentrated in Basins 1, 7, and 8; Basin 7 having over 50

per cent. While the growth outlook appears good, and is certainly optimistic, there is nothing automatic about its occurring. A basic assumption governing the projections is that economic development will be pursued aggressively; certainly, they would not be even approximately realized without it. This involves long range planning and all that goes with it, including investments in the future to produce the skilled workers, the trained leaders, transportation and communications, resource development, and production facilities, all of which are a basic part of achieving the growth potentials envisioned, which can be regarded as goals for the purposes of a program of economic development for the study area.

INDUSTRIAL RESOURCES AND POTENTIALS  
OF THE SOUTHEAST RIVER BASINS

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Mathematical-Economic Projections

Prepared for the  
United States Study Commission, Southeast River Basins

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Industrial Development Branch  
Engineering Experiment Station  
Georgia Institute of Technology  
August 1960

# INDUSTRIAL RESOURCES AND POTENTIALS OF THE SOUTHEAST RIVER BASINS

## Sections of the Final Report and Their Designations

<u>Title</u>	<u>Section</u>
Land Use Patterns and Planning Activity	A
Mineral Resources Review	B
Water Resources	C
Population and Labor Force	D
Employment	E
Personal Income	F
Disposable Income, Consumption, and Savings	G
Economic Indicators for Major Functional Segments of the Economy	H
Summary of Recent Trends in Economic Growth and Development	I
Economic-Statistical Projections	J
Mathematical-Economic Projections	K
Economic Development Potentials by River Basin	L

## Table of Contents

### Section K

#### Mathematical-Economic Projections

	<u>Page</u>
Forecasting Changes in the Nonagricultural Section of the Area's Economy, and Consequent Changes in Water Requirements	K-1
The Purpose of the Study	K-1
Some Important Methodological Considerations and the Limitations of the Forecasts	K-1
Forecasting Employment in the Southeast River Basins	K-7
Projection by Aggregates	K-9
Forecasting by Industry	K-10
The Water Intake	K-11
Suggested Refinements	K-12

The projections herein presented were obtained by Walter Kennon and Thera H. Richter, using sets of econometric equations conceived, designed, and developed by Ernst W. Swanson for the Southeast River Basins area. Assisting Professor Swanson, Mrs. Richter, and Dr. Kennon in this work were Miss Vivian G. Conklin and Messrs. Lee A. Dudley and Roger Sund. In addition to these, Dr. Paul Han participated in some of the earlier planning phases. It is emphasized by those chiefly responsible for developing and testing the conceptual framework, or model, that these projections and underlying equations represent a relatively new departure in analysis, and thus are subject to much reconsideration and refinement.



## MATHEMATICAL-ECONOMIC PROJECTIONS

### Forecasting Changes in the Nonagricultural Section of the Area's Economy and Consequent Changes in Water Requirements

#### The Purpose of the Study

The basic purpose of this study is to forecast the future economic development of the nonagricultural sector of the Southeast River Basins' economy. As a measure of economic development, employment by industry will be used.

From these forecasts the future water requirements of the region will be determined. The forecasts will be for the years 1975 and 2000.

#### Some Important Methodological Considerations and the Limitations of the Forecasts

Forecasting over such long time periods as are involved in the study has obvious shortcomings. In the case of some economic sectors the forecast will be based upon an experience that is relatively limited. Yet short experiences are inevitable in a dynamic economy. Some industries date from the Second World War and the data on them are therefore limited. Others have a far longer history but the disruptions of a deep depression and a great war may force the exclusion of certain years so that abnormalities may be avoided. Consequently, good judgment is essential to the proper evaluation of the forecast, and certain assumptions may be necessary if validity is to be assigned to the forecasts. Among these are the assumptions about the effects of technological and institutional change. It would be quite unwarranted to assume, for example, that a change in technology has multilateral effects, that is, that the effect of the technology is distributed over a great number of economic sectors and, possibly, equally in force.

Actually, the experiences with the several economic sectors vary considerably as to timing and the incidence of the impact. Consider the industrial sectors of the Southeast River Basins. Included are such varied industries as pulp and paper, textiles, and naval stores. The experience with each extends over periods of significantly different lengths. The importance of these experiences, measured through their effects, say, upon the output or employment of the economy, varies greatly from sector to sector. The determinants of the level of activity in each sector also vary in number and nature from one industrial sector to another.

For these reasons, forecasting over time may be best accomplished if some degree of recognition is given to these variations, as well as to the aggregate effect of individual developments. In other words, aggregation may hide the inter- and intra-sector effects, and consequently, the forecast may suffer.

To be sure, the general course of the area's economy may be charted with some validity through the use of such aggregates as total income payments, per capita income, total employment, etc., and each of these aggregates may in some fashion be projected. Each in its way measures the general level of economic activity and its variations. But no one of them is really "causal" or "explanatory" in the sense that it in itself explains the variation in economic activity. In this respect the aggregates resemble a thermometer, which measures the variation in temperature but does not explain the variations. If nothing else, they indicate the effects of changes in other variables, those that may be said to be explanatory.

When, say, total income payments are predicted to double over a given period of time, this change may or may not be of the highest possible significance. The degree of this significance depends upon the variables chosen to explain the course of total income payments, here termed the explanatory variables. These variables may in themselves be aggregates. Thus, a common practice today is to study the behavior of consumers in total, to find a measure of their willingness or propensity to consume--the ratio of the increment in spending to the increment of income. From this measure the so-called investment multiplier is derived as  $1/1 - b$ , where  $b$  is the ratio. The level of the expected income may be determined through the multiplication of the expected level of investment (an aggregate) by this multiplier.

This method of aggregative projection has validity only over fairly short time periods, for it may not reflect too well the changes in consumer tastes, technology, and the organization of economic activity. Such changes definitely influence the two major components of expenditure which determine the level of income: (1) consumption and (2) investment. In the long-run consumption stated as a propensity or differential appears to have some stability, but in the short-run--year to year, say--it varies from less than 0.5 to more than 0.85. Its variability reflects particularly the variability in the expenditures by consumers on durable goods. In the long run there appears to be no standard behavior of investment. Whether its relative position in the totality of expenditures is up or down appears to be indeterminate.

Nor are the reasons behind the variability of investment understood clearly. The fact is that, taken as an aggregate, investment is an unpredictable animal.

Only to the extent that there can be meaningful adjustment in these component variables of income can they come to have validity for the purpose of prediction. But since the reasons for the variability are relatively unestablishable, and the development of a method for the measurement and adjustment uncertain, such adjustments at their best can be hardly more than qualitative. Important economic changes and their effects therefore tend to be submerged through the process of aggregation itself. Aggregation acts to produce an average or its equivalent so that the within-equation variability tends to be wiped out. Variability, the understanding of which would be most essential to adequate prediction, may thus be by-passed.

Therefore, if changes of major significance are to be incorporated in the measure of the level of economic activity and in its prediction, the measures must be disaggregated. Then forecasts would be made for each segment of disaggregation following suitable statistical and econometric techniques. After the segments are adjusted for the changes affecting them, they would be put through the prediction process; then they would be reaggregated.

Looking to the segmentation and the measurement of economic activity within the segments, a particularly adaptable measure is here proposed: employment in each representative industry in the study area. It is especially useful in the study of economic regions. First, there are no better time series measuring economic activity. Regional income series are unavailable. Nor are there continuous regional time series of consumption or investment. The employment time series can be carried back to 1939, if the World War II years are extrapolated linearly to exclude their abnormality.

In other words, the method pursued in this particular study examines statistically and econometrically the changes in employment by industry in the study area. Manufacturing industries and the distributive trades are selected for examination. (Employment statistics for the services, the public utilities and railroads are unavailable except for selected years.) The economy of the Southeast River Basins is particularly colored by a group of sixteen industries:

SIC	Industry
14	Nonmetallic Mining
15-17	Construction
22	Textiles
23	Apparel
24	Lumber and Wood Products
25	Furniture and Fixtures
26	Paper and Allied Products
27	Printing and Publishing
28	Chemicals and Allied Products
31	Leather and Leather Products
32	Stone, Clay, and Glass Products
34	Fabricated Metals
35	Machinery, Except Electrical
50	Wholesale Trade
52-59	Retail Trade
61-66	Finance, Insurance, and Real Estate

These industries account not only for the main percentage of employment in the nonagricultural industries, but, except for agricultural, they also have accounted for the major elements of variability in the regional level of economic activity. Indeed, as agriculture has declined these industries have become an important source of employment for the agriculturally unemployed. They have also expanded to attract additional amounts of employment of particular skills. Among these sixteen industries there are several which appear to be the likeliest to carry the regional growth upward and will be the stimulators of the economic advance of the region. These are textiles, lumber, furniture, paper and pulpwood, stone, clay, and glass, chemicals and machinery. It is to be noted that these industries are closely related to the resources of the region. Some of them in turn will become sizeable users of water.

A forecast of each industry's employment is made by econometric methods. The aggregate of employment may be derived by summation of all these forecasts.

It is particularly significant that on the basis of the employment in each industry the industrial water needs of the region may be determined. The forecasting procedure involves constructing for each industry a forecasting equation, which is stated as a multiple regression. The equations for the sixteen industries and their parameters are listed in Table 1.

The parameters state the relationship between employment and the variables which are said to explain its variability. They state in effect an average relationship between the employment--the variable whose variability is to be explained--and the explanatory variables. Thus, in the case of the pulp and paper industry, its employment is found to be considerably determined by these explanatory variables:

$X_1$  - Industrial Chemicals Output Index, 1947-49 = 100

$X_2$  - Advertising Lineage (000,000)

$X_3$  - U. S. Retail Sales Deflated, 1947-49 = 100 (000,000,000)

$X_4$  - Time

$$X_0 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$$

$$X_0 = -230.26 - 3.70 X_1 + 89.58 X_2 - 68.51 X_3 + 860.69 X_4$$

$$\overline{R}_{0.2345}^2 = 0.9793$$

The parameter  $b_1$  thus states the relationship between the variable to be explained  $X_0$  or employment, and the explanatory variable,  $X_1$ . If  $X_1$  varies by 1, then  $X_0$  varies by  $b_1$  (-3.70) times 1. The other variables each in turn contribute their share of the explanation of the variability of  $X_0$ . The measure  $\overline{R}_{0.1234\dots n}^2$  states how much of the total variability in  $X_0$  has been explained by the explanatory variables, in this case:  $\overline{R}_{0.1234\dots n}^2$  (0.9793) times 100 gives the percentage of variability in  $X_0$  explained by the explanatory variables as a group (97.93 per cent).

The value "a" (-230.26 for the paper industry) states where the line of regression--the line of average relationships between  $X_0$  and the explanatory variables formed by the equation as values are assigned to  $X_1, X_2, \dots, X_n$ --cuts through the vertical axis. It thus shows the starting point for the plotting of the line of regression which obviously would not as a rule go through the origin.

The sixteen equations so derived may be used to project employment in each industry into future years. By substitution of the expected values for a given future year for each of the explanatory variables into the regression line,--now the forecasting equation--the expected value of employment is

derived for that year. Thus, for the pulp and paper industry the expected values for the year 1975 for the explanatory variables are:  $X_1 = 739$ ,  $X_2 = 376$ ,  $X_3 = 310.1$ ,  $X_4 = 31$ . Multiply these by their corresponding regression values  $b_1, b_2, \dots, b_n$ , add, and then add the value for  $a$ , all algebraically, and the 1975 value for  $X_0$  (36,154) employment is derived. This finding rests upon a twenty-year period of experience with employment in that industry. The war years, 1942-1946, are extrapolated to avoid "unnatural" aberrations attributable to the peculiarity of production under all-out war effort.

The 1975 and the 2000 values for the explanatory variables are obtained in several ways. Some are independent projections made by trade associations, government agencies, trade journals, and other standard sources. Others are made by the Industrial Development Branch on the basis of other econometric relationships or by projections from historical time series obtained through the fitting of a priori curves by the method of least squares. The latter technique has been applied in those situations where long experience with the given variable has been the rule, and the character of the change of the variable has thus been well established.

Modifications would be made when definitely foreseeable changes would raise or lower the long-run pattern of the variable. Moreover, where possible, the many projections have been double-checked against other projections of the same time series or against projections made by the Industrial Development Branch by still other techniques.

Whether contemporary techniques of establishing statistical reliability of the parameters by which the projections are made should be attempted is most debatable. The problem of projection of an economic time-series is not akin to the problem of statistical sampling by means of small samples from relatively known populations. In fact, the problem may be said to be not a problem in sampling at all. Rather, it is first a problem of dealing with limited data of an historical nature. Yet the historical data is placed within a certain context and setting so as to give it meaning in terms of the economic stage or phase of change that appears to be involved. The problem is the forecast, not from a sample, but from a number of observations which have time sequence and often show a definite trend. The objective is not to establish whether there is a sample from the one or another population. It is to determine whether a pattern over time of a sequence will or will not

exist. Indeed, the pattern is not based upon a sample but upon the population itself, a population which shows variability over time and not for a given moment of time. If the sequence is selected with a given set of background circumstances in view, the problem is whether this sequence will or will not continue, or whether it will take on different patterns over the time projection. While the analysis involved imparts to the time series a theoretical content, the analysis is still largely historically oriented.

It is most essential, therefore, that the changes which may affect the behavior of a time series over time be understood and given recognition. It is not essential that sampling error be studied.

#### Forecasting Employment in the Southeast River Basins

The economic development of a region will place certain requirements upon that region in the way of water resources. There are, to be sure, a number of water uses. Those contemplated here are for industrial processing and production.

The economic growth pattern of the Southeast River Basins will be determined from the projections of a group of the most salient industries in the area. Since data are not available, there will be no direct projection of railroad, public utility, and governmental activity. From the projections of the group, the projections for nonagricultural industries excluding railroads and public utilities will be derived.

The industries upon which attention will be focused are those which fundamentally contribute the most to the region's growth. The study area is predominantly characterized by those industries closely related to the resources of the region, for example, timber, nonmetallic mining, cattle, tobacco, and cotton. The manufacturing industries which make use of these resources work with the extractive industries to generate the economic growth of the region. Indeed, the regional growth could be projected largely according to the growth patterns of these industries: textile, lumber, furniture, paper and pulpwood, stone, clay and glass, machinery, chemicals. Given their expected growth, the growth of the Southeast River Basins may be determined. In a large measure this is the pattern of forecast applied in this study.

As a matter of reflecting fairly adequately the changes in the very pattern of growth, however, the variables included in the study of growth should be sufficiently descriptive of the industrial structure. This means



that there should not be a high level of aggregation (summation across the board) of the data. As developed in detail in the previous section, the effect of aggregation oftentimes is to bury the change so that little if any effect may be given to it.

The determination of the level--present and future--of economic activity may go out from the analysis and projection of such broad and encompassing indicators of activity as total income payments, per capita income payments, and employment. Since the concern in this study is with the input aspects of the regional economy, employment is chosen as the best measure of economic activity. In itself employment is an excellent measure of activity as well as an input element, since production and distribution labor in particular produces roughly 80 per cent of total income. Couple this portion with administrative employment, and a large segment of the income generating sector is accounted for. Furthermore, employment statistics are available for consecutive years since 1939 for the industries involved in the delineation of the income generating structure of the industrial sector of the regional economy.

As developed in the previous section on method, employment for sixteen industries is projected industry by industry. The method of projection used for the most part is multiple regression analysis. The projections of the sixteen industries serve as a most useful check upon the projection of employment by aggregates, i.e., the total nonagricultural employment in the area.

All computations of the regression or forecasting equations have been made on a I.B.M. 650 Electronic Computer with its system of checks on the accuracy of the computations.

The judgments as to the validity of the forecasting constants or parameters are based upon the theoretical or a priori argument about the nature of the industries, their structure of causality, and their varying rates in the growth of the regional economy, as well as upon the extent to which the variables used to explain the changes in employment account for the total change in employment, industry by industry. The measure of this accounted-for change is given by the square of the multiple correlation coefficient or the coefficient of determination (adjusted for the degrees of freedom lost by the use of two or more variables in the correlation). Thus, a multiple correlation coefficient  $\left(\bar{R}_{0.123\dots n}^2\right)$  squared of 0.95 states that the



variability (change) in employment is accounted for by the variables chosen to explain it to the amount of 95 per cent. This indicates that a highly acceptable set of variables has been chosen as variables explaining the change in employment. The addition of other variables to the explanation may not add very much to its effectiveness, although there are several correlations in the study whose  $\bar{R}_{0.123...n}^2$  is found to be greater than 0.95. An  $\bar{R}_{0.123...n}^2$  of 0.80 is not to be "sneezed at." Eighty per cent explanations can be exceedingly useful. It is only when the per cent drops to 50 and below that the usefulness of the set of variables is highly debatable. Then others should be definitely substituted or new ones found.

### Projection by Aggregates

As a first approximation to the future economic level of the study area, the nonagricultural employment is first estimated as an aggregate, for the years 1975 and 2000. In a multiple-regression relationship the total employment is stated as being correlated to Gross National Product (G.N.P.) and long term trend or time. The argument behind this relationship is simple. G.N.P. reflects the changes in the nation's economic activity about as well as any other measure. Since many of the products of the region are exported to the nation, rather than consumed in the region, the variation in exports is believed to be closely attuned to the variation in G.N.P.

The  $\bar{R}_{0.123...n}^2$  (adjusted for degrees of freedom) for the relationship is found to be 0.9791+. In effect, 98 per cent of the variability in non-agricultural employment in the area is accounted for by the variation in G.N.P. and time. It may therefore be said that most of the employment change is geared to the national economic behavior. This is only natural in the modern industrial economy with its high degree of inter-industry relationship.

Projections are made by the regression equation of the nonagricultural employment, excluding government, railroad, and public utility employment. These latter industries are so closely geared to the growth of mining, agriculture, forestry, and manufacturing that they need not be considered essentially "causal" or explanatory in effect.

The nonagricultural employment aggregates for 1975 and 2000 are found to be 1,378,000 and 2,867,000, respectively. See Table 2.

With some simple modifications, the study by some standards could be terminated at this point. The water consumption according to the level of

nonagricultural employment could be derived by the application of the appropriate factors to the employment forecasts. But this approach has definite limitations.

There is also a need to look at the effects of change upon the components of the aggregate employment. As is developed in greater detail in the above section, there are significant variations from industry to industry in growth and hence in the use of water. Presumably, total employment (an aggregate) could reflect the mean or average of changes. But as experience has shown, this is unlikely. The task is not one of dealing with a sample of economic observations in the literal sense from a given universe at a particular point of time. It is, instead, one of treating a phenomenon of alternately changing equilibria over time. The best hope is to get periods of stability as benchmarks of change. It would seem under these conditions that the application of sampling criteria becomes largely meaningless. The criteria really involved must be such as to make possible an evaluation of change which is not necessarily distributed normally, or even consistently skewed. We work towards finding what is the most pertinent long-run trend.

Aggregation would in fact tend to wash out the variations only in part, while sometimes the variation in a single sector (or possibly two or three sectors) of the economy may do much to set the pattern of change for an entire economic structure. Therefore, aggregation may hide the fundamental changes occurring, or expected to occur, in a region. The need therefore is to study the developments by industry, or at least by the most significant industries and those most subject to change. Industries of particular interest to this study are those which may record the greatest growth and those which may become the greatest users of water.

#### Forecasting by Industry

To get around the limitations of aggregation, the sixteen industries listed above are analyzed separately and then aggregated. This reaggregation makes possible another projection of total employment, hence a check on the forecast just made, in addition to the review of each industry's contribution to employment and thus to water consumption.

The results of the projections are entered in Table 2. This table represents both the original data and the projections for 1975 and 2000. The first column gives the aggregates and their projections to 1975 and 2000 by the

method just discussed. The final column gives the totals for the sixteen industries, original and projected.

The projections to 1975 and 2000 on the basis of the individual sixteen industries are 974,000 and 1,928,000. These figures must be adjusted upward to embrace the other employments not included in the projections on a single industry basis. This is done by the division of the factor 0.69 into each of the two forecasts. This factor is derived from a study of the trend of their relationship between the excluded and included industries over the twenty-year period. The adjustment yields aggregates of 1,400,000 and 2,790,000 employees for the years 1975 and 2000, respectively, as compared with 1,378,000 and 2,867,000 by the aggregative method. Obviously, the closeness of the two estimates suggests that the forecasts by either method are quite tenable.

#### The Water Intake

On the basis of such projections the water intake may be computed. The average water intake for United States manufacturing industries is 585,000,000,000 gallons per year per million workers. A check of the average for the Southeast River Basin shows that there is no great deviation there from this mean. It is multiplied by the number of workers stated in millions, for each year of the forecast. The results are as follows:

$$\begin{aligned} 1975: & 585,000,000,000 \times 1.4 \text{ (million workers)} \\ & \div 0.69 = 1,187,000,000,000 \text{ gallons of water.} \end{aligned}$$

2000:  $585,000,000,000 \times 2.79 \div 0.69 = 2,365,000,000,000$  gallons of water, for nonagricultural industries excluding railroads and public utilities.

Another adjustment should be made. Because of productivity increases in most of the industries, a correction upward of the employment forecasts is essential if the correct water intakes are to be derived. Since employment per unit of output has been decreasing in nearly all of the industries, the final forecast must be inflated to reflect the opposite of this change. Unfortunately there are no adequate measures of productivity by industry available. Hence the correction must be done on an aggregative basis. The procedure is to compute the employment that would have existed in 1975 and 2000 had there been no decreases due to productivity changes.

1. The employment in 1958 is assumed to grow annually by two per cent compounded annually. (Some other per cent could have been chosen but this

seemed to be the most reasonable, given present knowledge.) Other factors are held constant.

2. The increases to 1975 and 2000 over 1958 added to the 1975 and 2000 figures to produce the 1975 and 2000 employment figures adjusted upward to reflect observance of the negative productivity effect.

	<u>1975</u>	<u>2000</u>
Total Employment Forecast	1,400,000	2,790,000
Allowance for 2% Productivity Increase	<u>333,521</u>	<u>1,080,993</u>
Total Employment Forecast at Constant 1958 Productivity	1,733,521	3,870,993

The adjusted figures so derived are now multiplied by 585 billion gallons to yield the adjusted 1975 and 2000 water needs for processing and production, in the industry of the area. The results are:

$$\begin{aligned} 1975: & 585,000,000,000 \times 1.7 \text{ (million workers)} \div 0.69 \\ & = 1,441,000,000,000 \text{ gallons of water} \end{aligned}$$

$$\begin{aligned} 2000: & 585,000,000,000 \times 3.9 \text{ (million workers)} \div 0.69 \\ & = 3,306,000,000,000 \text{ gallons of water} \end{aligned}$$

#### Suggested Refinements

At this stage of the study, certain data and analytical deficiencies are found to be present. Time has not permitted the correction of these deficiencies.

First, further refinements of the employment data for some industries and the data for some explanatory variables may be desirable. Second, the correlations for three or so industries could possibly be improved by the change to better explanatory variables. Third, the analysis has not yet taken into consideration special growth possibilities in such industries as nonmetallic mining, lumber, and possibly chemicals. Fourth, there are possible errors in the equations which may be attributable to inter-variable correlation of the explanatory variables. The need is for proper identification of the relationship assumed to exist.

The first two deficiencies would require a relatively short time to remove. They were not caught at the time of the analysis but were picked up during the writing and could not then be corrected. Two weeks or so of intensive work would go a long way towards effecting their removal.

The second type of deficiency can be corrected only upon further analysis of the industries involved, and of their possibilities as to unusual technology and marketing developments. Consider, for example, nonmetallic mining. This industry could become a much larger user of water than it now is. The industry in the Southeast River Basins produces sizeable quantities of kaolin clays which are now used in increasing quantities in ceramics, paper coating, textile fillers, and chemicals. These uses may be expanded significantly. A major producer of copper in the U. S. has recently developed a method for the production of alumina from kaolin clay and the method bids fair to make alumina from these clays competitive with its production from bauxite. Once the "bugs" are removed,--and progress is being made--the major source of alumina in this country may become the kaolins found in various areas, among them notably the Southeast River Basins. This area has very large deposits of rich clays containing up to 35 per cent or more of aluminum oxide. The beneficiation process would possibly consume water in large amounts. Study should be made of this potential.

Another industry promising growth is lumber. Already considerable amounts of chip board, particle board and other forms of hardboard are being produced in the Southeast. To be sure there is no production of related boards in the Southeast River Basins, but the area has great potentials. As the newer wood adhesives are developed and reduced in price, the production of a board from almost the entirety of the tree becomes possible. This board would have qualities possessed by no lumber existing today. It would be tough, of great tensile strength, fire resistant beyond any lumber, termite-proof, and weather proof. It could be used in circumstances where no lumber could possibly serve.

Moreover, the study area produces trees of such size in such short time as can be matched by no other section of the United States. It is the logical place for forests designed to grow the basic wood for this new plasticized lumber.

Obviously, this could then become the greatest industry in the area, dependent partly upon whether water use patterns in the area permit its great forests to be made even greater in size and production. Water is naturally essential, and irrigation of the forests is not an impossibility in the light of the economic potentials of this kind of lumber. Therefore, special studies should be made of the industry's potentials and water needs. The time of such studies would vary with the amount of detail desired.

Finally, to provide both methodological improvement and a check upon the work so far completed, a structural equations system should be created from the multiple regression equations used in the industry by industry forecasts. The present system of equations, as stated, may contain errors internal to the equations. This represents a statistical problem of modern development, and it grows out of the fact that sometimes there may be inter-variable correlation of the explanatory variables, as well as out of the fact that it is sometimes difficult to establish what is a "causal" variable as against an "effect" variable. The simultaneous solution of a system of regression equations which are reconstructed to contain variables from other equations offers a solution to the problem. Thus, the pulp and paper industry employment may be related to the employment in the industries which are large end-users of paper and pulp products. The employment variables would be incorporated in the paper and pulp multiple-regression variable as variables from the outside which, however, have a conceivable effect upon employment in the given industry. The same recorrelation would take place for all the equations, so that the inter-industry effect could be had directly. Then the solution of all variables would be made simultaneously.

The set of system parameters so obtained describes as can no other system the nature of the sectional or regional economy. These parameters state both the within-industry effects of one variable on the other and of inter-industry effects of one variable on the other. This system permits particularly the study of the effect of a major institutional or technological change upon the system. Thus, if alumina output becomes an actuality in the area, then the change in the nonmetallic mining industry could have significant effects upon some other industries of the region. The system parameters would be made to reflect through a recomputation the effect of the given industry change. Thus, both indirect and direct effects would be recorded. Such change is not adequately treated by other methods. Indeed the other methods may not be able to treat it other than as a value judgment.

Approximately a month would be entailed in the reconstruction of the equations and their recomputation.

Table 1

## ESTIMATING EQUATIONS FOR EMPLOYMENT

Nonmetallic Mining (SIC 14)

$$X_0 = 4,652.54 + 109.22 X_1 - 124.12 X_2 + 240.84 X_3$$

$X_1$  - Stone, Clay and Glass Output Index 1947-49=100

$X_2$  - Pulp and Paper Output Index 1947-49=100

$X_3$  - Time

Construction (SIC 15-17)

$$X_0 = 52.87 + 0.92 X_1 - 0.24 X_2 - 2.06 X_3 - 1.56 X_4 + 740.12 X_5$$

$X_1$  - Cost/sq.ft. of Business Property

$X_2$  - Total Income Payments, S.E. (0,000,000)

$X_3$  - Automobile Registration, S.E. (000)

$X_4$  - Value of Construction Contracts, S.E. (000,000)

$X_5$  - Time

Textile (SIC 22)

$$X_0 = 36,065.45 + 19.23 X_1 + 556.75 X_2 - 1,862.72 X_3$$

$X_1$  - Disposable Personal Income U.S. (00,000,000)

$X_2$  - Textile Output Index 1947-49=100

$X_3$  - Time

Apparel (SIC 23)

$$X_0 = 3,352.56 + 23.88 X_1 - 269.31 X_2 + 1,007.75 X_3$$

$X_1$  - Disposable Personal Income U.S. (00,000,000)

$X_2$  - Apparel Output Index 1947-49=100

$X_3$  - Time

Table 1 (continued)  
ESTIMATING EQUATIONS FOR EMPLOYMENT

Lumber and Wood Products (SIC 24)

$$X_0 = -101,048.61 + 9.37 X_1 - 0.07 X_2 + 875.29 X_3 - 12,864.94 X_4$$

$X_1$  - Value of Contract Construction, S.E. (000,000)

$X_2$  - Marriages

$X_3$  - G. N. P. (000,000)

$X_4$  - Time

Furniture and Fixtures (SIC 25)

$$X_0 = 108.98 + 1.56 X_1 - 33.29 X_2 - 0.22 X_3 + 608.53 X_4$$

$X_1$  - Marriages

$X_2$  - Gross National Product (000,000,000)

$X_3$  - United States Residential Construction

$X_4$  - Time

Paper and Allied Products (SIC 26)

$$X_0 = -230.26 - 3.70 X_1 + 89.58 X_2 - 68.51 X_3 + 860.69 X_4$$

$X_1$  - Industrial Chemicals Output Index 1947-49=100

$X_2$  - Advertising Lineage (000,000)

$X_3$  - U.S. Retail Sales Deflated 1947-49=100 (000,000,000)

$X_4$  - Time

Printing and Publishing (SIC 27)

$$X_0 = 5,126.62 + 5.20 X_1 - 19.34 X_2 + 0.50 X_3 + 322.68 X_4$$

$X_1$  - Advertising Lineage, U.S. (000,000)

$X_2$  - G. N. P. (000,000,000)

$X_3$  - Retail Sales, S.E. (000,000)

$X_4$  - Time



Table 1 (continued)  
ESTIMATING EQUATIONS FOR EMPLOYMENT

Chemicals and Allied Products (SIC 28)

$$X_0 = 14,458.65 - 254.08 X_1 - 3.08 X_2 + 264.29 X_3 + 7.48 X_4 - 1,502.36 X_5$$

- $X_1$  - Textile Output Index 1947-49=100
- $X_2$  - Farm Output, S.E. (000,000)
- $X_3$  - Pulp and Paper Output Index 1947-49=100
- $X_4$  - Total Income Payments, S.E. (0,000,000)
- $X_5$  - Time

Leather and Leather Products (SIC 31)

No estimating equation developed.

Stone, Clay and Glass Products (SIC 32)

$$X_0 = 5,494.52 + 4.94 X_1 + 2.12 X_2 - 6.55 X_3 + 239.58 X_4$$

- $X_1$  - Value of Contract Construction, S.E. (000,000)
- $X_2$  - Food Sales (000,000)
- $X_3$  - Total Income Payments, S.E. (0,000,000)
- $X_4$  - Time

Fabricated Metals (SIC 34)

$$X_0 = 3,276.27 - 1.30 X_1 - 2.31 X_2 + 5.63 X_3 - 0.55 X_4 + 511.81 X_5$$

- $X_1$  - Farm Output, S.E. (000,000)
- $X_2$  - Value of Contract Construction, S.E. (000,000)
- $X_3$  - Sales of Consumer Durables, S.E. (000,000)
- $X_4$  - Sales of Food Products (000,000)
- $X_5$  - Time

Table 1 (continued)  
ESTIMATING EQUATIONS FOR EMPLOYMENT

Machinery, Except Electrical (SIC 35)

$$X_0 = -10,839.27 + 2.54 X_1 + 2.74 X_2 + 0.09 X_3 - 108.48 X_4$$

- $X_1$  - Cash Farm Income, S.E. (000,000)
- $X_2$  - Minerals Output, S.E. (000)
- $X_3$  - U.S. New Construction (000,000)
- $X_4$  - Time

Wholesale Trade (SIC 50)

$$X_0 = -28,842.27 + 5.17 X_1 + 43.27 X_2 + 32.88 X_3 - 3,772.78 X_4$$

- $X_1$  - Retail Sales, S.E. (0,000,000)
- $X_2$  - Highway Mileage, S.E. (00)
- $X_3$  - Total Income Payments, S.E. (0,000,000)
- $X_4$  - Time

Retail Trade (SIC 52-59)

$$X_0 = 40,500.83 - 5.78 X_1 + 108.21 X_2 - 17.99 X_3 + 434.09 X_4$$

- $X_1$  - Savings in the River Basin Area (000,000)
- $X_2$  - Total Income Payments (000,000)
- $X_3$  - Consumer Short-term Credit (000,000)
- $X_4$  - Time

Finance, Insurance, and Real Estate (SIC 61-66)

$$X_0 = -1,904.09 + 2,032.11 X_1 - 0.19 X_2 + 4.51 X_3 + 931.52 X_4$$

- $X_1$  - Yield on Corporate Bonds
- $X_2$  - Value of Construction, S.E. (000,000)
- $X_3$  - Savings in the River Basin Area (000,000)
- $X_4$  - Time

Table 2

NONAGRICULTURAL EMPLOYMENT IN THE RIVER BASINS AREA  
EXCLUDING TRANSPORTATION AND PUBLIC UTILITIES

<u>Year</u>	Total Nonagricultural (estimated from G.N.P.)	Non- metallic Mining	<u>Construction</u>	<u>Textiles</u>	<u>Apparel</u>	<u>Lumber</u>
<u>Actual</u>						
1939	439,620	1,614	22,740	94,701	16,116	19,490
1940	439,905	1,993	26,584	99,526	17,614	25,223
1941	512,137	1,797	43,037	112,838	19,506	39,384
1947	626,774	4,518	39,622	120,540	22,829	66,830
1948	650,374	4,651	43,782	124,517	24,677	63,701
1949	627,277	4,569	40,035	114,789	26,290	57,327
1950	629,205	5,334	37,751	116,368	26,067	56,378
1951	705,624	4,820	52,057	126,925	29,382	66,758
1952	722,162	4,864	50,098	121,134	30,885	60,064
1953	755,646	4,689	69,718	125,650	37,935	55,887
1954	743,189	4,558	58,498	118,540	39,220	48,687
1955	775,806	4,581	55,873	119,600	43,477	49,608
1956	823,504	4,745	57,717	118,417	45,456	48,609
1957	857,844	4,814	58,276	115,311	47,535	42,492
1958	833,299	4,711	56,983	108,888	47,018	36,469
<u>Forecast</u>						
1975	1,378,100	9,505	94,000 <sup>(a)</sup>	144,278	101,326	72,000 <sup>(a)</sup>
2000	2,867,050	49,165	185,000 <sup>(a)</sup>	223,464	235,675	105,000 <sup>(a)</sup>

(a) Estimate modified from estimating equation.

Table 2 (continued)

NONAGRICULTURAL EMPLOYMENT IN THE RIVER BASINS AREA  
EXCLUDING TRANSPORTATION AND PUBLIC UTILITIES

<u>Year</u>	<u>Furniture</u>	<u>Paper</u>	<u>Printing and Publishing</u>	<u>Chemicals</u>	<u>Leather</u>	<u>Stone, Clay and Glass</u>
<u>Actual</u>						
1939	7,867	4,760	4,520	15,604	4,728	6,002
1940	7,917	4,476	4,312	14,608	2,797	6,319
1941	9,318	3,737	4,432	13,920	3,191	6,758
1947	5,964	9,180	5,774	12,967	2,339	5,608
1948	6,112	10,361	6,119	11,753	2,502	5,856
1949	5,692	10,866	6,295	11,697	2,175	2,175
1950	6,595	12,979	6,723	11,044	2,122	5,558
1951	7,188	14,243	6,730	12,612	2,468	8,038
1952	6,689	14,766	7,301	12,682	2,267	8,045
1953	8,717	17,178	7,358	12,291	2,572	8,155
1954	7,463	18,019	7,769	14,882	2,493	7,551
1955	8,056	18,622	7,974	16,038	2,749	8,025
1956	8,899	19,038	8,875	16,516	3,024	8,867
1957	8,355	20,153	9,375	17,047	3,422	9,417
1958	7,761	19,809	9,752	15,629	3,837	9,871
<u>Forecast</u>						
1975	15,000 <sup>(a)</sup>	36,154	15,426	22,458	6,500 <sup>(a)</sup>	18,894
2000	20,000 <sup>(a)</sup>	39,605	25,770	53,897	18,000 <sup>(a)</sup>	46,985

(a) Estimate modified from estimating equation.

Table 2 (continued)

NONAGRICULTURAL EMPLOYMENT IN THE RIVER BASINS AREA  
EXCLUDING TRANSPORTATION AND PUBLIC UTILITIES

<u>Year</u>	<u>Fabricated Metals</u>	<u>Machinery, Excluding Electrical</u>	<u>Wholesale Trade</u>	<u>Retail Trade</u>	<u>Finance, Insurance, Real Estate</u>	<u>Total Sixteen Industries</u>	<u>Total Non- agricultural</u>
<u>Actual</u>							
1939	-0-	354	12,540	76,754	10,502	298,292	
1940	139	348	14,156	84,821	13,238	324,035	
1941	187	390	14,574	105,157	13,911	392,137	
1947	2,895	5,670	27,032	126,627	18,703	477,098	
1948	3,547	5,143	29,457	133,530	20,903	496,611	
1949	2,953	5,205	29,926	130,091	21,046	474,514	
1950	3,428	4,732	28,474	132,417	22,202	478,479	
1951	3,990	6,142	31,102	144,378	24,063	540,896	
1952	3,781	6,426	32,561	149,134	26,209	536,876	
1953	4,573	5,665	33,397	156,883	28,210	578,878	
1954	5,401	5,814	33,113	155,823	28,982	556,813	
1955	5,139	6,374	34,117	160,575	30,837	571,645	
1956	5,868	7,731	34,169	177,995	35,444	601,370	
1957	6,477	8,033	35,843	186,799	37,298	610,647	
1958	5,826	7,423	35,632	182,597	38,974	591,180	
<u>Forecast</u>							
1975	10,884	16,728	51,455	278,865	83,320	974,000 <sup>(a)</sup>	1,400,000
2000	20,000 <sup>(a)</sup>	36,891	145,398	461,597	251,691	1,928,000 <sup>(a)</sup>	2,790,000

(a) Estimate modified from estimating equation.

Table 3

NONMETALLIC MINING, EXCEPT FUELS (SIC 14)  
EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$
<u>Year</u>	<u>Mining</u>	<u>Stone, Clay</u>	<u>Pulp &amp; Paper</u>	
	<u>Employment</u>	<u>Output Index</u>	<u>Output Index</u>	<u>Time</u>
		<u>1947-49=100</u>	<u>1947-49=100</u>	
<u>Actual</u>				
1939	1,614	57	72	0
1940	1,993	62	77	1
1941	1,797	81	94	2
1947	4,518	98	99	3
1948	4,651	105	102	4
1949	4,569	97	98	5
1950	5,334	118	118	6
1951	4,820	131	125	7
1952	4,864	125	120	8
1953	4,689	133	132	9
1954	4,558	131	134	10
1955	4,581	149	152	11
1956	4,745	158	159	12
1957	4,814	155	158	13
1958	4,711	145	160	14
<u>Forecast</u>				
1975	9,505	317	300	31
2000	49,165	875	520	56

Estimating Equation

$$X_0 = 4,652.54 + 109.22 X_1 - 124.12 X_2 + 240.84 X_3$$

$$\bar{R} = 0.900521 \quad \bar{R}^2 = 0.810938$$

Table 3 (continued)

NONMETALLIC MINING, EXCEPT FUELS (SIC 14) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Mining Employment ( $X_0$ )

The data are from the state departments of labor. For the years 1949-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Stone, Clay, and Glass Output Index 1947-49=100 ( $X_1$ )

Board of Governors of the Federal Reserve System. The data are reported in the Federal Reserve Bulletin and Statistical Abstract of the United States.

Pulp and Paper Output Index 1947-49=100 ( $X_2$ )

Board of Governors of the Federal Reserve System. The data are reported in the Federal Reserve Bulletin and Statistical Abstract of the United States.

Table 4

CONSTRUCTION (SIC 15, 16, AND 17)  
EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$
	Construction	Cost/sq.ft.	Total Income	Auto	Value of	
	Employment	Business	Payments S.E.	Regis-	Construction	
		Property	(0,000,000)	tration	Contracts S.E.	
Year				(000)	(000,000)	Time
1939	22,740	4.54	516	1,303	198	0
1940	26,584	4.69	572	1,397	272	1
1941	43,037	5.62	703	1,595	455	2
1947	39,622	7.11	1,014	1,768	322	3
1948	43,782	8.64	1,015	1,930	348	4
1949	40,035	9.76	1,015	2,154	359	5
1950	37,751	9.92	1,135	2,463	499	6
1951	52,057	16.88	1,211	2,718	633	7
1952	50,098	17.95	1,284	2,913	643	8
1953	69,718	15.06	1,345	3,168	474	9
1954	58,498	12.98	1,341	3,371	520	10
1955	55,873	14.22	1,512	3,822	619	11
1956	57,717	13.15	1,626	4,057	637	12
1957	58,276	12.91	1,680	4,309	658	13
1958	56,983	12.91	1,725	4,455	759	14

Estimating Equation

$$X_0 = 52.874073 + 0.92199408X_1 - 0.24485152X_2 - 2.0574654X_3 - 1.5580842X_4 + 740.12213X_5$$

$$\bar{R} = 0.83429 \quad \bar{R}^2 = 0.755033$$



Table 4 (continued)

CONSTRUCTION (SIC 15, 16, AND 17) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Construction Employment ( $X_0$ )

State departments of labor. 1955 and prior years adjusted to a coverage of four or more employees. The years 1939, 1940, and 1941 are estimations.

Cost/sq.ft. Business Property ( $X_1$ )

Sources: Statistical Abstract.... Their source, F. W. Dodge Corporation. (Addition of commercial and industrial construction and their division.)

Coverage: 37 Eastern states through 1956, 48 states after 1956. State and regional breakdown available.

Total Income Payments ( $X_2$ )

U. S. Department of Commerce, Office of Business Economics, as reported in Survey of Current Business and Statistical Abstract. The data are for Alabama, Florida, Georgia, and South Carolina. The data have been deflated by using the B.L.S. Consumer Price Index.

Automobile Registration ( $X_3$ )

Automobiles (excluding taxis), excluding trucks, buses, government-owned vehicles and motorcycles. Six states (Ala., Fla., Ga., S. Car., N. Car., and Tenn.). Sources: Department of Commerce, Highway Statistics, as reported in Statistical Abstract.

Value of Construction Contracts, S.E. ( $X_4$ )

Source: F. W. Dodge Corporation as reported in Statistical Abstract. The data have been deflated using the Engineering News-Record's building cost index.

Table 5  
TEXTILE (SIC 22) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$
<u>Year</u>	<u>Textile Employment</u>	<u>Disposable Personal Income U.S. (00,000,000)</u>	<u>Textile Output Index 1947-49=100</u>	<u>Time</u>
<u>Actual</u>				
1939	94,701	1,185	70	0
1940	99,526	1,270	71	1
1941	112,838	1,479	95	2
1947	120,540	1,781	101	3
1948	121,134	1,841	105	4
1949	114,789	1,863	94	5
1950	116,368	2,020	111	6
1951	126,925	2,050	107	7
1952		2,103	103	8
1953	125,650	2,207	104	9
1954	118,540	2,238	95	10
1955	119,600	2,397	107	11
1956	118,417	2,500	104	12
1957	115,311	2,538	99	13
1958	108,888	2,567	98	14
<u>Forecast</u>				
1975	144,278	4,520	142	31
2000	223,464	9,700	189	56

Estimating Equation

$$X_0 = 36,065.45 + 19.23 X_1 + 556.75 X_2 - 1,862.72 X_3$$

$$\bar{R} = 0.868931 \quad \bar{R}^2 = 0.755033$$

Table 5 (continued)

TEXTILE (SIC 22) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Textile Employment ( $X_0$ )

These data are from the state departments of labor. For the years 1949-48, county data are used. For years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to four or more employees per firm.

Disposable Personal Income U. S. ( $X_1$ )

Disposable personal income is from the U. S. Department of Commerce. The data have been deflated by the Bureau of Labor Statistics Consumer Price Index, 1947-49=100.

Textile Output Index ( $X_2$ )

These are the industrial production indexes developed by the Federal Reserve System.

Table 6

## APPAREL (SIC 23) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$
<u>Year</u>	<u>Apparel Employment</u>	<u>Disposable Personal Income U. S. (00,000,000)</u>	<u>Apparel Output Index 1947-49=100</u>	<u>Time</u>
<u>Actual</u>				
1939	16,116	1,185	61	0
1940	17,614	1,270	60	1
1941	19,506	1,479	80	2
1947	22,829	1,781	97	3
1948	24,677	1,841	102	4
1949	26,290	1,863	101	5
1950	26,067	2,020	108	6
1951	29,382	2,050	105	7
1952	30,885	2,103	108	8
1953	37,935	2,207	110	9
1954	39,220	2,238	105	10
1955	43,477	2,397	113	11
1956	45,456	2,500	112	12
1957	47,535	2,538	111	13
1958	47,018	2,567	110	14
<u>Forecast</u>				
1975	101,326	4,520	153	31
2000	235,675	9,700	207	56

Estimating Equation

$$X_0 = 3,352.56 + 23.88 X_1 - 269.31 X_2 + 1,007.75 X_3$$

$$\bar{R} = 0.988412 \quad \bar{R}^2 = 0.976961$$

Table 6 (continued)

APPAREL (SIC 23) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Apparel Employment ( $X_0$ )

These data are from the state departments of labor. For the years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Disposable Personal Income U. S. ( $X_1$ )

Disposable personal income is from the U. S. Department of Commerce. The data have been deflated by using the Bureau of Labor Statistics Consumer Price Index, 1947-49=100.

Apparel Output Index ( $X_2$ )

These are the industrial production indexes developed by the Federal Reserve System.

Table 7

## LUMBER AND WOOD PRODUCTS (SIC 24) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
	Lumber	Value of Contract Construction S.E.		G. N. P.	
<u>Year</u>	<u>Employment</u>	<u>(000,000)</u>	<u>Marriages</u>	<u>(000,000)</u>	<u>Time</u>
<u>Actual</u>					
1939	19,490	197.5	129,987	153	0
1940	25,223	271.7	149,119	169	1
1941	39,384	455.4	163,021	200	2
1947	66,630	322.4	187,456	245	3
1948	63,701	347.7	157,390	252	4
1949	57,327	358.7	134,884	253	5
1950	56,378	499.1	140,708	277	6
1951	66,758	633.1	143,680	296	7
1952	60,064	643.0	141,867	306	8
1953	55,887	474.0	144,263	319	9
1954	48,687	519.9	144,922	316	10
1955	49,608	619.0	153,877	347	11
1956	48,609	636.6	153,789	361	12
1957	42,492	657.6	145,343	366	13
1958	36,469	758.6	144,050	358	14
<u>Forecast</u>					
1975	72,794	2,068.0	173,700	646	31
2000	479,135	9,445.0	214,800	1,402	56

Estimating Equation

$$X_0 = -101,048.61 + 9.37 X_1 - 0.07 X_2 + 875.29 X_3 - 12,864.94 X_4$$

$$\bar{R} = 0.913858 \quad \bar{R}^2 = 0.835130$$

Table 7 (continued)

LUMBER AND WOOD PRODUCTS (SIC 24) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Lumber Employment ( $X_0$ )

These data are from the state departments of labor. For the years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Value of Contract Construction ( $X_1$ )

Value of contract construction is from the F. W. Dodge Corporation as reported in Statistical Abstract. The data has been deflated by using the building cost index of the Engineering News-Record. Six Southern states are used.

Marriages ( $X_2$ )

National Office of Vital Statistics, Public Health Service. The area measured is Alabama, Florida, Georgia, and South Carolina.

Gross National Product ( $X_3$ )

Department of Commerce, Office of Business Economics. The data have been deflated by using the B.L.S. Consumer Price Index. 1947-49=100.

Table 8

## FURNITURE (SIC 25) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
	Furniture Employment	Marriages	Gross National Product (000,000,000)	United States Residential Construction	Time
<u>Year</u>					
<u>Actual</u>					
1939	7,867	129,987	153	110.9	0
1940	7,917	149,119	169	157.0	1
1941	9,318	163,021	200	152.7	2
1947	5,964	187,456	245	208.0	3
1948	6,112	157,390	252	253.6	4
1949	5,692	134,884	253	245.2	5
1950	6,595	140,708	277	384.7	6
1951	7,188	143,680	296	327.6	7
1952	6,689	141,867	306	324.8	8
1953	8,717	144,263	319	332.7	9
1954	7,463	144,922	316	352.6	10
1955	8,056	153,877	347	404.7	11
1956	8,899	153,789	361	366.1	12
1957	8,355	145,343	366	344.5	13
1958	7,761	144,050	358	344.0	14
<u>Forecast</u>					
1975		173,700	646		31
2000		214,800	1,402		56

Estimating Equation

$$X_0 = 108.98 + 1.56 X_1 - 33.29 X_2 - 0.22 X_3 + 608.53 X_4$$

$$\bar{R} = 0.650091 \quad \bar{R}^2 = 0.422622$$



Table 8 (continued)

FURNITURE (SIC 25) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Furniture Employment ( $X_0$ )

These data are from the state departments of labor. For the years 1938-48 the data are estimations. All data have been adjusted for changes in coverage to include all firms with four or more employees.

Marriages ( $X_1$ )

National Office of Vital Statistics, Public Health Service. The area measured in Alabama, Florida, Georgia, and South Carolina.

Gross National Product ( $X_2$ )

Survey of Current Business, U. S. Department of Commerce. Deflated by the Consumer Price Index of the Bureau of Labor Statistics.

United States Residential Construction ( $X_3$ )

Value of contract construction is from the F. W. Dodge Corporation, as reported in Statistical Abstract. The data are for six Southern states. The data have been deflated by using the building cost index of the Engineering News-Record.

Table 9

## PAPER (SIC 26) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
	Paper Employment	Industrial Chemicals Output Index 1947-49=100	Advertising Lineage (000,000)	U. S. Retail Sales Deflated 1947-49=100 (000,000,000)	Time
<u>Actual</u>					
1939	4,760	42	104	72.4	0
1940	4,476	46	106	79.3	1
1941	3,737	62	109	90.3	2
1947	9,180	95	167	128.1	3
1948	10,361	105	189	129.9	4
1949	10,866	101	192	131.3	5
1950	12,979	126	203	143.0	6
1951	14,243	146	207	141.0	7
1952	14,766	140	209	143.1	8
1953	17,178	154	218	147.8	9
1954	18,019	153	215	147.3	10
1955	18,622	184	237	160.6	11
1956	19,038	196	243	163.3	12
1957	20,153	203	236	166.4	13
1958	19,809	247	224	162.3	14
<u>Forecast</u>					
1975	36,154	739	376	310.1	31
2000	39,605	4,414	610	681.3	56

Estimating Equation

$$X_0 = -230.26 - 3.70 X_1 + 89.58 X_2 - 68.51 X_3 + 860.69 X_4$$

$$\bar{R} = 0.989609 \quad \bar{R}^2 = 0.979332$$

Table 9 (continued)

PAPER (SIC 26) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Paper Employment ( $X_0$ )

These data are from the state departments of labor. For the years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Industrial Chemicals Output Index 1947-49=100 ( $X_1$ )

These are indexes of industrial production from the Board of Governors of the Federal Reserve System.

Advertising Lineage ( $X_2$ )

Newspaper advertising lineage for 52 cities. Source: Compiled by Media Records, Inc., and published currently by Department of Commerce, Office of Business Economics in Survey of Current Business.

U. S. Retail Sales ( $X_3$ )

U. S. Department of Commerce, Survey of Current Business. Deflated by B.L.S. Consumer Price Index 1947-49=100.

Table 10

## PRINTING AND PUBLISHING (SIC 27) EMPLOYMENT AND SUPPORTING VARIABLES

<u>Year</u>	<u>X<sub>0</sub></u> Printing & Publishing Employment	<u>X<sub>1</sub></u> Advertising Lineage, U.S. (000,000)	<u>X<sub>2</sub></u> G. N. P. (000,000,000)	<u>X<sub>3</sub></u> Retail Sales S. E. (000,000)	<u>X<sub>4</sub></u> Time
<u>Actual</u>					
1939	4,520	104	153	3,379	0
1940	4,312	106	169	3,549	1
1941	4,432	109	200	3,900	2
1947	5,774	167	245	7,014	3
1948	6,119	189	252	6,997	4
1949	6,295	192	253	6,976	5
1950	6,723	203	277	7,900	6
1951	6,730	207	296	7,808	7
1952	7,301	209	306	8,358	8
1953	7,358	217	319	8,914	9
1954	7,769	215	316	8,598	10
1955	7,974	236	347	10,404	11
1956	8,875	243	361	11,086	12
1957	9,375	238	366	11,469	13
<u>Forecast</u>					
1975	15,426	376	646	21,669	31
2000	25,770	610	1,402	53,031	56

Estimating Equation

$$X_0 = 5,126.62 + 5.20 X_1 - 19.34 X_2 + 0.50 X_3 + 322.68 X_4$$

$$\bar{R} = 0.9941258 \quad \bar{R}^2 = 0.9882869$$

Table 10 (continued)

PRINTING AND PUBLISHING (SIC 27) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Printing and Publishing Employment ( $X_0$ )

The data are from the state departments of labor. For the years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Advertising Lineage, U. S. ( $X_1$ )

U. S. Department of Commerce, Office of Business Economics, Survey of Current Business.

G. N. P. ( $X_2$ )

Supplement to the Survey of Current Business. The data have been deflated by using the B.L.S. Consumer Price Index 1947-49=100.

Retail Sales, S.E. ( $X_3$ )

The 1939 data are from the 1939 Census of Business. For the years 1947 to 1958 the source is Sales Management's Survey of Buying Power. For the years 1940 and 1941 the data are estimations. The data have been deflated by using the B.L.S. Price Index 1947-49=100.

Table 11

## CHEMICALS (SIC 28) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$
	Chemical Employment	Textile Output Index 1947-49=100	Farm Output S.E. (000,000)	Pulp and Paper Output Index 1947-49=100	Total Income Payments S.E. (0,000,000)	Time
<u>Actual</u>						
1939	15,604	70	1,436	72	516	0
1940	14,608	71	1,354	77	572	1
1941	13,920	95	1,293	94	703	2
1947	12,967	101	1,598	99	1,014	3
1948	11,753	105	1,536	102	1,015	4
1949	11,697	94	1,650	98	1,015	5
1950	11,044	111	1,749	118	1,135	6
1951	12,612	107	1,788	125	1,211	7
1952	12,682	103	1,860	120	1,284	8
1953	12,291	104	2,062	132	1,345	9
1954	14,882	95	1,944	134	1,341	10
1955	16,038	107	2,292	152	1,512	11
1956	16,516	104	2,489	159	1,626	12
1957	17,047	99	2,345	158	1,680	13
1958	15,629	98	2,483	160	1,725	14
<u>Forecast</u>						
1975	22,458	142	4,050	300	3,187	31
2000	53,897	189	6,346	520	7,180	56

Estimating Equation

$$X_0 = 14,458.65 - 254.08 X_1 - 3.08 X_2 + 264.29 X_3 + 7.48 X_4 - 1,502.36 X_5$$

$$\bar{R} = 0.939426$$

$$\bar{R}^2 = 0.882523$$

Table 11 (continued)

CHEMICAL (SIC 28) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Chemical Employment ( $X_0$ )

The data are from the state departments of labor. For the years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Textile Output Index 1947-49=100 ( $X_1$ )

This index of industrial production is from the Board of Governors of the Federal Reserve System. Data are published in the Federal Reserve Bulletin and the Statistical Abstract.

Farm Output, S.E. ( $X_2$ )

Statistics on the Developing South published by the Federal Reserve Bank of Atlanta. Data have been deflated by the B.L.S. Farm Products Index.

Pulp and Paper Output Index 1947-49=100 ( $X_3$ )

This index of industrial production is from the Board of Governors of the Federal Reserve System. Data are published in the Federal Reserve Bulletin and the Statistical Abstract.

Total Income Payments, S.E. ( $X_4$ )

U. S. Department of Commerce, Office of Business Economics as reported in the Survey of Current Business and Statistical Abstract. The data are for Alabama, Georgia, Florida, and South Carolina. The data have been deflated by using the B.L.S. Consumer Price Index.

Table 12

## LEATHER (SIC 31) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$
<u>Year</u>	<u>Leather</u>	<u>Livestock</u>	<u>Total Income</u>	
<u>Actual</u>	<u>Employment</u>	<u>Production</u>	<u>Payments</u>	<u>Time</u>
		<u>(1,000,000)</u>	<u>(\$1,000,000)</u>	
1939	4,728	548	516	0
1940	2,797	526	572	1
1941	3,191	550	703	2
1947	2,339	824	1,014	3
1948	2,502	829	1,015	4
1949	2,175	883	1,015	5
1950	2,122	903	1,135	6
1951	2,468	969	1,211	7
1952	2,267	996	1,284	8
1953	2,572	1,073	1,345	9
1954	2,493	1,130	1,341	10
1955	2,749	1,243	1,512	11
1956	3,024	1,333	1,626	12
1957	3,422	1,491	1,680	13
1958	3,837	1,626	1,725	14

An estimating equation was developed but is not satisfactory.

$$\bar{R} = 0.69478$$

$$\bar{R}^2 = 0.48272$$



Table 12 (continued)

LEATHER (SIC 31) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Leather Employment ( $X_0$ )

These data are from state departments of labor. For the years 1939 to 1948, inclusive, the data are estimations. All data have been adjusted in coverage to include firms with four or more employees.

Livestock Production ( $X_1$ )

Statistics on the Developing South, Federal Reserve Bank of Atlanta. These data have been deflated by using the B.L.S. Consumer Price Index.

Total Income Payments ( $X_2$ )

U. S. Department of Commerce, Office of Business Economics, as reported in Survey of Current Business and Statistical Abstract. These data are for Alabama, Florida, Georgia, and South Carolina. The data have been deflated by using the B.L.S. Consumer Price Index.

Table 13

STONE, CLAY, AND GLASS PRODUCTS (SIC 32) EMPLOYMENT AND  
SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
<u>Year</u>	<u>S. C. &amp; G.</u>	<u>Value of</u>		<u>Total Income</u>	
<u>Actual</u>	<u>Employment</u>	<u>Contract</u>	<u>Food Sales</u>	<u>Payments, S.E.</u>	<u>Time</u>
		<u>(1,000,000)</u>	<u>(1,000,000)</u>	<u>(10,000,000)</u>	
1939	6,002	198	1,319	516	0
1940	6,319	272	1,388	572	1
1941	6,758	455	1,382	703	2
1947	5,608	322	2,086	1,014	3
1948	5,856	348	1,871	1,015	4
1949	5,558	359	1,987	1,015	5
1950	5,865	499	2,422	1,135	6
1951	8,038	633	2,446	1,211	7
1952	8,045	643	2,758	1,284	8
1953	8,155	474	2,919	1,345	9
1954	7,551	520	2,899	1,341	10
1955	8,025	619	3,343	1,512	11
1956	8,867	637	3,727	1,626	12
1957	9,417	658	3,937	1,680	13
1958	9,871	759	4,044	1,725	14
<u>Forecast</u>					
1975	18,894	2,068	7,845	3,187	31
2000	46,985	9,445	13,417	7,180	56

Estimating Equation

$$X_0 = 5,494.52 + 4.94 X_1 + 2.12 X_2 - 6.55 X_3 + 239.58 X_4$$

$$\bar{R} = 0.923782$$

$$\bar{R}^2 = 0.853371$$

Table 13 (continued)

STONE, CLAY, AND GLASS PRODUCTS (SIC 32) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

S. C. & G. Employment ( $X_0$ )

The data are from the state departments of labor. For the years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Value of Contract Construction, S.E. ( $X_1$ )

Value of contract construction is from the F. W. Dodge Corporation, as reported in Statistical Abstract. The data have been deflated by using the building cost index of the Engineering News-Record. Six Southern states are used.

Food Sales ( $X_2$ )

For the years 1947 to 1958, the source is Sales Management. For 1939 the source is the 1939 Census of Business. The years 1940 and 1941 are estimations. The data have been deflated by using the B.L.S. Consumer Price Index 1947-49=100.

Total Income Payments S.E. ( $X_3$ )

U. S. Department of Commerce, Office of Business Economics, as reported in Survey of Current Business and Statistical Abstract. The data have been deflated by using the B.L.S. Consumer Price Index 1947-49=100. The states covered are Alabama, Florida, Georgia, and South Carolina.

Table 14

## FABRICATED METAL (SIC 34) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$
	Fabricated Metal Employment	Farm Output S.E. (000,000)	Value of Contract Construction S.E. (000,000)	Durables S.E. (000,000)	Sales of Food Products (000,000)	Time
<u>Actual</u>						
1947	2,895	1,598	322	627	2,086	0
1948	3,547	1,536	348	604	1,871	1
1949	2,953	1,650	359	545	1,987	2
1950	3,428	1,749	499	628	2,422	3
1951	3,990	1,788	633	583	2,446	4
1952	3,781	1,860	643	667	2,758	5
1953	4,573	2,062	474	668	2,919	6
1954	5,401	1,944	520	648	2,899	7
1955	5,139	2,292	619	723	3,343	8
1956	5,868	2,489	637	787	3,727	9
1957	6,477	2,345	658	808	3,937	10
1958	5,826	2,483	759	806	4,044	11
<u>Forecast</u>						
1975	10,884	4,050	2,068	1,356	7,845	28
2000	9,687	6,346	9,445	2,972	13,417	53

Estimating Equation

$$X_0 = 3,276.27 - 1.30 X_1 - 2.31 X_2 + 5.63 X_3 - 0.55 X_4 + 511.81 X_5$$

$$\bar{R} = 0.943349$$

$$\bar{R}^2 = 0.889910$$

Table 14 (continued)

FABRICATED METAL (SIC 34) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Fabricated Metal Employment ( $X_0$ )

The data are from the state labor departments. For the years 1938-48 the data are estimations. All data have been adjusted for changes in coverage to include firms with four or more employees.

Farm Output, S. E. ( $X_1$ )

Statistics on the Developing South, prepared by the Federal Reserve Bank of Atlanta. These data have been deflated by using the Bureau of Labor Statistics Price Index for Farm Products 1947-49=100.

Value of Contract Construction, S.E. ( $X_2$ )

F. W. Dodge Corporation, as reported in Statistical Abstract. The data have been deflated by using the building cost index of the Engineering News-Record, 1913=100. Six Southern states are included.

Sales of Consumer Durables, S.E. ( $X_3$ )

Sales of Food Products ( $X_4$ )

The source is Sales Management's Survey of Buying Power for the years 1947-58. The 1939 source is the 1939 Census of Business. For the years 1938-1940 and 1941 the data are estimations. The data have been deflated by using the B.L.S. Consumer Price Index.

Table 15

## MACHINERY, EXCEPT ELECTRICAL (SIC 35) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
<u>Year</u>	Machinery, Ex. Elec. Employment	Cash Farm Income, S.E. (\$1,000,000)	Minerals Output, S.E. (\$1,000)	U. S. New Construction (\$1,000,000)	Time
<u>Actual</u>					
1939	354	1,436	2,294	10,746	0
1940	348	1,354	2,642	14,403	1
1941	390	1,293	3,211	16,690	2
1947	5,670	1,598	3,724	17,941	3
1948	5,143	1,536	3,795	21,170	4
1949	5,205	1,650	3,249	21,793	5
1950	4,732	1,749	3,637	26,841	6
1951	6,142	1,788	3,519	26,190	7
1952	6,426	1,860	3,602	28,131	8
1953	5,665	2,062	3,823	28,987	9
1954	5,814	1,944	3,740	29,894	10
1955	6,374	2,292	3,928	31,992	11
1956	7,731	2,489	4,028	31,735	12
1957	8,033	2,345	3,993	31,822	13
1958	7,423	2,483	4,000	31,408	14
<u>Forecast</u>					
1975	16,728	4,050	5,151	72,550	31
2000	36,891	6,346	7,376	194,180	56

Estimating Equation

$$X_0 = -10,839.27 + 2.54 X_1 + 2.74 X_2 + 0.09 X_3 - 108.48 X_4$$

$$\bar{R} = 0.893192205$$

$$\bar{R}^2 = 0.797792316$$

Table 15 (continued)

MACHINERY, EXCEPT ELECTRICAL (SIC 35) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Machinery, Except Electrical Employment ( $X_0$ )

These data are from the state departments of labor. For the years 1939-48, inclusive, the data are estimations. All data have been adjusted for changes in coverage to include all firms with four or more employees.

Cash Farm Income, S.E. ( $X_1$ )

Statistics on the Developing South, prepared by the Federal Reserve Bank of Atlanta. The data have been deflated by using the Bureau of Labor Statistics Price Index for Farm Products.

Minerals Output, S.E. ( $X_2$ )

Minerals Yearbook, prepared by the United States Department of the Interior, Bureau of Mines. The data have been deflated by the Bureau of Labor Statistics Price Index for Mining Products.

U. S. New Construction ( $X_3$ )

U. S. Department of Labor, Construction Review, as reported in the Statistical Abstract. Deflated by the Engineering News-Record's building cost index, 1947-49=100.

Table 16

## WHOLESALE TRADE (SIC 50) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
<u>Year</u>	Wholesale Trade <u>Employment</u>	Retail Sales S.E. <u>(0,000,000)</u>	Highway Mileage, S.E. <u>(00)</u>	Total Income Payments, S.E. <u>(0,000,000)</u>	<u>Time</u>
<u>Actual</u>					
1939	12,540	338	594	516	0
1940	14,156	355	608	572	1
1941	14,574	390	633	703	2
1947	27,032	701	751	1,014	3
1948	29,457	700	774	1,015	4
1949	29,926	698	819	1,015	5
1950	28,474	790	890	1,135	6
1951	31,102	781	967	1,211	7
1952	32,561	836	1,027	1,284	8
1953	33,397	891	1,083	1,345	9
1954	33,113	860	1,118	1,341	10
1955	34,117	1,040	1,174	1,512	11
1956	34,169	1,109	1,199	1,626	12
1957	35,843	1,147	1,234	1,680	13
1958	35,632	1,158	1,278	1,725	14
<u>Forecast</u>					
1975	51,455	2,167	1,878	3,187	31
2000	145,398	5,303	2,820	7,180	56

Estimating Equation

$$X_0 = -28,842.27 + 5.17 X_1 + 43.27 X_2 + 32.88 X_3 - 3,772.78 X_4$$

$$\bar{R} = 0.945197$$

$$\bar{R}^2 = 0.893398$$



Table 16 (continued)

WHOLESALE TRADE (SIC 50) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Wholesale Trade Employment ( $X_0$ )

Data are from the state departments of labor. For the years 1938-48 the data are estimations. All data have been adjusted for changes in coverage to four or more employees.

Retail Sales, S.E. ( $X_1$ )

The 1939 data are from the 1939 Census of Business. For the years 1947 to 1958 the source is Sales Management's Survey of Buying Power. For the years 1938, 1940, 1941 the data are estimations. All data have been deflated by using the Bureau of Labor Statistics Consumer Price Index (1947-49=100).

Highway Mileage, S.E. ( $X_2$ )

Data are from Highway Statistics, U. S. Bureau of Public Roads.

Total Income Payments, S.E. ( $X_3$ )

U. S. Department of Commerce, as reported in Statistical Abstract and Survey of Current Business. The data are for Alabama, Florida, Georgia, and South Carolina. All data have been deflated by using the B.L.S. Consumer Price Index.

Table 17

## RETAIL TRADE (SIC 51 TO 59 INCL.) EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
<u>Year</u>	<u>Retail Trade Employment</u>	<u>Savings in R. B. A. (000,000)</u>	<u>Total Income Payments (000,000)</u>	<u>Consumer Short-Term Credit (000,000)</u>	<u>Time</u>
<u>Actual</u>					
1939	76,754	1,263	516	365	0
1940	84,821	1,381	572	477	1
1941	105,157	1,725	703	539	2
1947	126,627	2,748	1,014	425	3
1948	133,530	2,542	1,015	489	4
1949	130,091	2,706	1,015	544	5
1950	132,417	2,936	1,135	694	6
1951	144,378	2,901	1,211	677	7
1952	149,134	3,050	1,284	762	8
1953	156,883	3,251	1,345	884	9
1954	155,823	3,509	1,341	916	10
1955	160,575	3,811	1,512	1,066	11
1956	177,995	4,025	1,626	1,183	12
1957	186,799	4,142	1,680	1,250	13
1958	182,597	4,326	1,725	1,292	14
<u>Forecast</u>					
1975	278,865	11,040	3,187	3,121	31
2000	461,597	43,110	7,180	7,281	56

Estimating Equation

$$X_0 = 40,500.83 - 5.78 X_1 + 108.21 X_2 - 17.99 X_3 + 434.09 X_4$$

$$\bar{R} = 0.988691$$

$$\bar{R}^2 = 0.977515$$

Table 17 (continued)

RETAIL TRADE (SIC 51 to 59 incl.) EMPLOYMENT AND SUPPORTING VARIABLES  
SOURCES AND NOTES

Retail Trade Employment ( $X_0$ )

The data are from the state departments of labor. For the years 1939-48 the data are estimates. All data have been adjusted for changes in coverage to include firms with four or more employees.

Savings in the River Basins Area ( $X_1$ )

Savings data have been developed by IDB from such sources as the Federal Reserve Banks and various trade associations. Demand deposits are included. The data have been deflated by using the B.L.S. Consumer Price Index. 1947-49=100.

Total Income Payments ( $X_2$ )

Survey of Current Business and Statistical Abstract. Data are for Alabama, Georgia, Florida, and South Carolina. The data have been deflated by using the B.L.S. Consumer Price Index. 1947-49=100.

Consumer Short-term Credit ( $X_3$ )

The data for 1941 and prior years are estimated, since they are not available. The process was to assume that consumer installment credit and short-term loans are similar, thus fitting the movements of the installment credit to the short-term loans. For the years 1947 to 1958, the source is the Federal Deposit Insurance Corporation, Annual Report. The figures for 1941 and prior years are from the Federal Reserve Bank. The data have been deflated by using the B.L.S. Consumer Price Index. 1947-49=100.

Table 18

FINANCE, INSURANCE, AND REAL ESTATE (SIC 60, 61, 62, 63, 64, 65, 66, 67)  
EMPLOYMENT AND SUPPORTING VARIABLES

	$X_0$	$X_1$	$X_2$	$X_3$	$X_4$
<u>Year</u>	<u>F.I.R.E.</u> <u>Employment</u>	<u>Yield on</u> <u>Corporate</u> <u>Bonds</u>	<u>Value of Con-</u> <u>struction, S.E.</u> <u>(000,000)</u>	<u>Savings in</u> <u>R.B.A.</u> <u>(000,000)</u>	<u>Time</u>
<u>Actual</u>					
1939	10,502	3.77%	198	1,263	0
1940	13,238	3.55	272	1,381	1
1941	13,911	3.34	455	1,725	2
1947	18,703	2.86	322	2,748	3
1948	20,903	3.08	348	2,542	4
1949	21,046	2.96	359	2,706	5
1950	22,202	2.86	499	2,936	6
1951	24,063	3.08	633	2,901	7
1952	26,209	3.19	643	3,050	8
1953	28,210	3.43	474	3,251	9
1954	28,982	3.16	520	3,509	10
1955	30,837	3.25	619	3,811	11
1956	35,444	3.57	637	4,025	12
1957	37,298	4.21	658	4,142	13
1958	38,974	4.16	759	4,326	14
<u>Forecast</u>					
1975	83,320	3.42	2,068	11,040	31
2000	251,691	4.33	9,445	43,110	56

Estimating Equation

$$X_0 = -1,904.09 + 2,032.11 X_1 - 0.19 X_2 + 4.51 X_3 + 931.52 X_4$$

$$\bar{R} = 0.995445$$

$$\bar{R}^2 = 0.990917$$

Table 18 (continued)

FINANCE, INSURANCE, AND REAL ESTATE (SIC 60, 61, 62, 63, 64, 65, 66, 67)  
EMPLOYMENT AND SUPPORTING VARIABLES

SOURCES AND NOTES

F.I.R.E. Employment ( $X_0$ )

Data are from the state departments of labor. For the years 1938-48 the data are estimations. All data have been adjusted for changes in coverage to include all firms with four or more employees.

Yield on Corporate Bonds ( $X_1$ )

This is the yield on corporate bonds from the Federal Reserve Bulletin. Bonds are on a sample basis from those with maturities of 10 years or more.

Value of Construction, S.E. ( $X_2$ )

Value of contract construction is from the F. W. Dodge Corporation, as reported in Statistical Abstract. Data have been deflated by the building cost index of the Engineering News-Record (1913=100). Six Southern states are used.

Savings in R.B.A. ( $X_3$ )

Developed by IDB from banking statistics in the Atlanta Federal Reserve Bank Library, from trade associations, and from other basic data. The data have been deflated by the Consumer Price Index of the B.L.S. (1947-49=100.)

SECTION L

. Many helpful contributions to this section of the report came from various members of the Industrial Development Branch, and from Professor John L. Fulmer, of the Georgia Institute of Technology. Special credit goes to Mr. Robert E. Van Geuns, and to Mrs. Beaufort L. Johnson, for appraising the growth prospects of many of the chemical process industries and of several other categories of manufacturing. The project director accepts responsibility for the conclusions.

## Table of Contents

ECONOMIC DEVELOPMENT POTENTIALS BY RIVER BASIN	<u>Page</u>
Manufacturing Potentials Involving Significant Water Use Magnitudes and/or Pollution Problems	L-1
Pulp and Paper	L-2
Chemicals and Allied Products -- General	L-3
Chemical Formulating Industries	L-5
Petroleum Refining and Petrochemicals	L-9
Cement	L-11
Iron and Steel	L-12
"Water Problem" Manufacturing Potentials by River Basin	L-14
Savannah River Basin	L-14
Ogeechee River Basin	L-15
Altamaha River Basin	L-16
Satilla-St. Marys River Basin	L-16
Suwannee River Basin	L-17
Ochlockonee River Basin	L-17
Apalachicola River Basin	L-17
Perdido-Escambia River Basin	L-18
Other Manufacturing Potentials	L-20
Chemical Utilization of Wood and Wood Wastes	L-20
Plastics	L-20
Synthetic Fibers	L-21
Refractories	L-23
Other Products	L-24



## Table of Contents (Continued)

	<u>Page</u>
Nonmanufacturing Development Potentials	L-26
Estimated Distribution by River Basin	L-26
Potentials by Industry Division	L-27
General Pattern of Growth Potentials by Industry and Area	L-30

## ECONOMIC DEVELOPMENT POTENTIALS BY RIVER BASIN

### Manufacturing Potentials Involving Significant Water Use Magnitudes and/or Pollution Problems

Certain manufacturing industries were selected for an appraisal of their growth potentials in the study area within the next 40 years. Those chosen from the standpoint of their total water intake needs were selected from an analysis of special unpublished data from the Census of Manufactures made available by the U. S. Bureau of the Census. The manufacturing industries included in the Census data were those establishments with a gross water intake in 1954 of 20 million gallons or more. The national average for all industries thus represented was about 1.35 billion gallons yearly, or about 4,140 acre-feet, per establishment. From these an initial list was made of the industries exceeding the average. Then a secondary list was made to include (a) industries approaching the average and no lower than 75 per cent of it; and (b) industries, other than those already selected on a water intake basis, which pose significant pollution problems. These problems vary in difficulty of solution; industries selected on this basis are not necessarily nuisances from a public health standpoint, but they do have pollution loads of significant magnitude, and the problems thereby created or magnified may or may not be unmanageable.

The results of the aforementioned selection process are given in lists A and B, below. Many, but not all, of these industries are held to have growth potentials in one or more basins or sub-basins of the study area in the course of the next four decades. Analysis of such growth potentials is based on judgment factors which, though subjective, are related to industry forecasts and to first-hand knowledge of persons in

the Industrial Development Branch of present economic characteristics and recent trends in the various localities.

S.I.C. No.	List "A"	S.I.C. No.	List "B"
261	Pulp, paper, and board	201	Meat products
281	Industrial inorganic and organic chemicals	203	Canning and preserving
286	Gum and wood chemicals	206	Sugar
289	Chemical products, n.e.c.	223	Broadwoven fabrics
291	Petroleum refining	269	Pulp, paper, and products, n.e.c.
324	Cement, hydraulic	283	Drugs and medicines
331	Blast furnaces and steel mills	284	Soap and related products
333	Primary nonferrous metals	285	Paints and allied products
341	Tin cans and other tinware	287	Fertilizers
344	Structural metal products	295	Paving and roofing materials
366	Communication equipment	335	Nonferrous rolling and drawing
372	Aircraft and parts		

Several of the industries in the foregoing lists, and certain other industries closely related to them, are of special interest from the standpoint of the significant effects they are expected to exert on the course of economic development in many parts of the study area. Such industries and industry groups include pulp and paper, chemical formulating industries, drugs and medicines, petroleum refining and petrochemicals, cement, and steel mills.

#### Pulp and Paper

The pulp and paper industry is still in a state of rapid expansion, and can be expected to continue expanding until at least 1980. The study area is presently one of the most important pulp producing sections of the country, based on its tremendous forest resources. These forests should be capable of supporting a level of pulp production of perhaps two or three times the present magnitude, taking into account an anticipated rise in pulpwood yields per acre. Since markets for pulp are also expanding, the likelihood is that the study area's wood pulp production will double or

triple during the next 30 or 40 years. This will be done by expanding the capacity of existing mills and by adding new ones. The new mills will probably locate in the Coastal Plains Province, away from metropolitan areas except in the case of port cities.

Another likely development will be an increase of paper manufacturing capacity in the area. At present great quantities of wood pulp are shipped from mills within the study area to converting mills in other regions. In the future, greater quantities and additional qualities of paper will be produced in the study area. The process will be gradual as to quality-grade production, but already some of the finer papers are being produced in some areas of the Southeast region. The new paper mills will tend to locate close to markets, so will be attracted to the larger metropolitan areas. Basins 1, 3, 7, and 8 are the leading basins in this respect.

The development of the pulp and paper industry in several parts of the study area has already brought many complementary enterprises, attracted to the region by the presence of the primary mills. These sundry industries come for one of two reasons. Many find it advantageous to be near the pulp and paper mills for sales of equipment, supplies, and services. Others are attracted because the products or by-products of the mills are used as raw materials in their own operations, and they find economic advantages in being near their major raw material sources. Additional ancillary industries, such as those using chemical pulp, are promising possibilities for the years ahead.

#### Chemicals and Allied Products -- General

The study area lacks some of the important raw materials on which a heavy chemical industry is based, particularly rock salt and sulfur. Its limestone resources are largely unproved. Most of the calcium carbonate (main component of limestone) found so far is in the form of marble, which

is too expensive for industrial chemical use. Neither does the area possess proved oil supplies or coal, either of which can support a large scale production of organic chemicals, nor iron ore (except for limited quantities in a few Georgia areas south of Columbus in Basin 7, and in a few Coastal Plain counties of Alabama), basic to the iron and steel industry.

On this basis it would seem that the study area is not particularly well suited for the more basic types of chemical manufacturing, which are somewhat raw material oriented. This is only partly true, however. Because of its deepwater ports, the Atlantic and Gulf Intracoastal Waterways, and its inland waterways which are being improved and extended, the area is in an excellent position to receive these materials by cheap water transport. This is actually being done already in some areas. Brunswick, Georgia has a plant for producing caustic soda and chlorine from salt, and captive sulfuric acid plants using sulfur are found at several locations in the study area. At Pensacola, petrochemicals are produced from natural gas, which comes in by pipeline from Louisiana and Texas. These possibilities of bringing in raw materials by ocean freighter, barge, or pipeline are very important for the study area's future chemical industry. The area is almost ideally located for receiving raw materials from the Caribbean, South America, and Africa.

Real possibilities for the future include petroleum refineries, using imported crude oil, direct reduction plants using imported iron ore, additional sulfuric acid production based on sulfur from the Gulf Coast, and refractory brick plants using zirconium ores from the Florida beaches.

From a long range point of view it seems likely that the study area, with its long sea coasts, will see a very important future industrial chemical development -- the extraction of many chemical raw materials from

sea water. The possible extraction products include potassium, magnesium, selenium, bromine, iodine, fluorine, and others. It is possible that extraction or concentration methods, or both, will be perfected to such an extent that salt could be obtained from sea water more cheaply than by mining and shipping it. These extractive industries naturally would locate on the coast, particularly in basins 1, 3, 4, 7 and 8.

Factors favoring the foregoing possible developments include the relatively low costs of construction. The mild climate permits the use of cost-cutting construction methods which are not feasible in areas with more severe climates. Another favorable factor is the comparatively low cost of labor, due more often to the absence of labor unrest or strife than to low wage levels.

#### Chemical Formulating Industries

Formulating industries are those which mix or blend chemical compounds or other materials to obtain finished products for the ultimate consumer. The products generally are sold to the final consumer through retail channels. In most instances they are mixtures of chemical compounds.

In the study area the principal formulating industries are the sanitary products, paint, cosmetics, pesticides, and textile size industries. Fertilizer mixing plants can also be regarded as formulating industries.

Sanitary Products. Among the main applications of sanitary products in the Southeast River Basins area are (1) germicides, antiseptics, and disinfectants; (2) bleaching agents for cotton and paper; and (3) detergents. Germicides, antiseptics, and disinfectants have been put to increasing use during the past two decades, in factories and various other buildings as well as in the home. This trend should continue and should further the growth of this industry in centers where it is already established, such as Atlanta.

Synthetic fibers may well continue to make inroads on cotton's position as a raw material for the area's textile industry. However, the resulting decrease in use of industrial sanitary products as cotton bleaches will be offset by the increase in usage for the manufacture of bleached paper and paperboard.

The detergent industry as a whole has shown spectacular growth and should continue at a slightly decelerated pace during the next forty years. According to a recent report on liquid detergents (by Robert E. Van Geuns, Industrial Development Branch, Engineering Experiment Station, Georgia Institute of Technology), a plant for liquid detergent manufacture is needed in the area to meet both the existing markets and expected increases in demand, taking advantage of savings in transportation costs.

Paints. The paint industry in the study area could expand in a fairly dynamic way during the 40-year period beginning in 1960. This prospect is based on the following facts from a recent report on paint production in a six-state area of the Southeast.<sup>1/</sup>

(1) The six-state area, of which the study area is a central part, needs to produce at twice its existing capacity to meet the demand in its own market.

(2) The rising cost of transportation may cause the industry to locate nearer the market or to decentralize.

(3) The area's increasing importance in the national paint market should continue because of the rise in income per family, high construction activity, and continuing industrial expansion.

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<sup>1/</sup> Eisenhauer, William C. and Robert E. Van Geuns, Paint Production -- A Manufacturing Possibility for Small Georgia Communities, Industrial Development Branch, Engineering Experiment Station, Georgia Institute of Technology, December 1959. The six states are Alabama, Florida, Georgia, the Carolinas, and Tennessee.

Cosmetics. Rising transportation costs in the cosmetics industry, as in others, may lead to decentralization. Up to the present, most cosmetics marketed in the area are "manufactured" (mixed) in other areas, with only the warehousing and distribution functions performed here. It is probable that in the future one or more national producing (formulating) organizations will locate within the area.

Pesticides. Pesticide consumption in the study area is expected to experience gradual but decisive growth during the next 40 years. The two principal factors in the pesticide industry's growth will be mechanization of the farm and expanded use of chemicals on the farm and in the forest.

Raw materials for the chemicals used in insecticides and weed killers come mainly from petroleum and natural gas. Until such time as these raw materials may be produced in the study area, they must be brought in. Because of this lack of locally-produced raw materials, the pesticide industry in the study area is largely a formulating industry. The advent of a petrochemical source in the area would be likely to lead to the attraction of a number of raw material manufacturing plants.

The main uses of pesticides and weed killers are in agriculture (crops) and forestry. Uses in dairying and cattle raising are growing.

Because of the expense of applying liquids, there is a tendency at present to use dusts on small farms; only large farms find it economic to use liquids. Most farms in the study area are still small and unmechanized, but the trend is toward fewer and larger farms. These lend themselves to a higher degree of mechanization and chemicalization. Thus the area's demand for pesticides should increase in the future.

Managed forest acreage in the study area is expected to expand. Pesticides have been used quite successfully in managed forests elsewhere in the nation, and this use in the study area is expected to increase greatly.



The use of insecticides in cattle raising and dairying has been found to be well worth the cost.<sup>2/</sup> The recent growth of dairying and cattle raising in the study area should continue, perhaps at a more rapid pace, during the next 40 years. The increased use of pesticides will accompany this growth.

Selective weed killers for fruit crops and major crops such as corn, as well as in forestry, should find increased application before the year 2000.

Textile Size Industry. Despite the lessened importance of cotton as a raw material for the textile industry, a modest growth in the textile size industry is expected in the future. Some of the synthetic fibers require smaller amounts of size than does cotton, but some require more.

#### Drugs

Forecasts indicate that drug production nationally will continue to expand at a rapid rate. One published estimate indicates that drug sales will reach some \$5.2 billion in 1975 as compared with about \$2 billion in 1960.<sup>3/</sup>

At present the study area has no appreciable share of the country's drug manufacturing. The largest plant is a Merck installation at Albany, Georgia which produces sulfa-type drugs. Most of the drugs consumed in the area are imported from the large Northeastern drug manufacturing concentration. Drugs in general are light in weight and very high in value, and

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<sup>2/</sup>"Insecticides have been a boon to cattle breeders and dairy farmers. The protection of cows from molestation by insects has increased milk production by 25 per cent, and each five cents spent by cattle breeders on DDT has increased their meat production by 50 pounds." Jacob Rosin and Max Eastman, The Road to Abundance, N. Y., 1953; page 130.

<sup>3/</sup>The Commercial and Financial Chronicle, May 14, 1959, page 3.

transportation costs for most raw materials and finished products are location factors of only minor importance. Major location factors include labor and, to some extent, the proximity of medical research centers. The study area's relatively favorable labor climate and its research facilities may help to attract new plants as the industry expands, especially since the industry is becoming increasingly competitive and cost-conscious. Current government investigations of alleged excessive profits in the drug industry could exert downward pressures on prices and thus increase efforts to cut production costs.

Within the next 40 years, therefore, the study area should gradually obtain some portion of the nation's drug industry. The more likely locations, at least for larger manufacturing units, will be the metropolitan areas. One particular zone of strong attraction will be Atlanta and vicinity, because of the market, distribution advantages, and the presence of medical research establishments. Smaller plants may locate in or near smaller cities, as in the case of Merck at Albany.

#### Petroleum Refining and Petrochemicals

The prospects of establishing one or more petroleum refineries in the study area do not depend solely on the success of oil exploration efforts in some of the coastal and offshore areas. The refining of imported crude oil can become a more immediate possibility, given changes in oil import policies which will insure adequate continuity of operations under competitive conditions. Adequate harbors and markets already exist, and continued growth in petroleum products consumption in the area will increase the attractiveness of the market for one or more refineries. One of the study area's ports, Port St. Joe, Florida, is used principally for petroleum products. Deepdraft tankers come in via its 37-foot entrance channel to feed the liquid petroleum products pipeline which supplies a large portion of

the study area. A feasibility analysis by the Industrial Development Branch of Georgia Tech's Engineering Experiment Station has concluded that a refinery at Brunswick, Georgia would prove quite profitable.

Coastal refineries in the study area can become sources of petrochemical raw materials, especially ethylene and propylene. Consequently, other plants might be built close to such refineries in order to convert the ethylene and propylene to polyethylene, polypropylene, ethylene oxide, and many other derivatives. Such developments would be significant in the further economic development of the study area, even though they would be of modest magnitude in comparison with the petrochemical centers of the Gulf Coast and the Northeast.

Another possibility of producing petrochemicals in the study area is to use natural gas from the pipe lines running through the area. This can be done through either of two procedures.

One method is to crack the methane, the chief component of natural gas, producing hydrogen and/or acetylene. Hydrogen is used for producing ammonia, and acetylene is perhaps the most important petrochemical building block from which vast numbers of products are synthesized. The study area now has an acetylene plant at Pensacola, Florida which uses acetylene to produce polyvinylchloride, and a hydrogen-ammonia-nitric acid plant at Savannah. It seems likely that more plants making petrochemicals from methane will come to the area because of the enormous growth predicted for petrochemicals in general. The area is a good market for synthetic fiber raw materials, which in the main are petrochemicals; for ammonia and nitrogenous fertilizer materials; and for plastic products, which are made from resins derived mainly from petrochemicals. One basic uncertainty affecting these possibilities, however, is the future price of natural gas. Some experts apprehend that natural gas might price itself out of the market as

a competitive raw material for petrochemicals. Nevertheless, another alternative exists. It has recently been found feasible to ship liquified methane from the U. S. to the United Kingdom. Rising natural gas prices in the U. S. might make it become economic to import Venezuelan liquified methane to supplement the natural gas supplies. Several of the study area's ports are well located for receiving the Venezuelan product. Part of this product could then be used as a petrochemical raw material. All area ports which are on a natural gas pipeline could then become feasible sites of a petrochemical industry. In the immediate future, the best locations appear to be Pensacola, Port St. Joe, and Savannah because they have the deepest entrance channels.

A second method of producing petrochemicals from natural gas is to strip the ethane, propane, butane, and higher fractions, and to use these as cracking stock for the production of such olefins (hydrocarbons) as acetylene, ethylene, propylene, and butylene. It may be that the only pipeline permitting such an operation on a large scale in the area is the Transcontinental Gas Pipeline. It runs through the northern part of the study area, roughly parallel with the Fall Line.

In sum, the prospects of a modest petrochemical industry in the study area look reasonably promising.

#### Cement

Continued increases in construction activity appear in store during the next four decades to keep pace with the needs generated by population growth, and the effective demand created by rising employment and income, increases in family formation and homebuilding, and greater industrialization. Recent increases in per capita cement consumption are likely to continue in the future, due in part to the national highway program and its multiplier effects in construction, and in part to technological developments

which are enabling many concrete products to compete effectively with steel and other rival construction materials. Portland cement is a basic raw material for the concrete products industry.

One essential in the location of a portland cement plant is the availability of adequate supplies and reserves of limestone of suitable quality, or equivalent materials high in calcium carbonate content. The limestone must be immediately accessible, either within a few overland miles of the mill site, or by cheap water transportation. Another prime requisite is access to an adequate market under favorable competitive conditions; this involves delivery costs to a series of local markets within a restricted geographic area which compare favorably with delivery costs to those markets from competing mills.

Within the study area, suitable grades of limestone in quantities of commercial importance have been found only in certain areas. One of these is in Houston County, Georgia, where there is an existing cement mill. Additional areas of promise exist in southwest Georgia, and a cement company has recently acquired a potential producing site in that area on the Flint River. Additional locations in the study area which are favorable from a marketing standpoint include Augusta and Brunswick, Georgia. These areas could attract cement mills between 1960 and 2000 if adequate supplies of limestone are found near suitable sites.

#### Iron and Steel

It appears almost inevitable that the country will need to meet a larger portion of its future iron and steel requirements from imported iron ores. Another likely development is the direct reduction of iron ore, bypassing the blast furnace. The combination of these two factors will doubtless bring about some further decentralization of the industry.

Research results indicate that the Southeast does not produce sufficient iron ore to meet its own requirements. Market forces may well result in the establishment here of one or more direct reduction installations using imported iron ores. The most likely locations are ports with deep entrance channels and good transportation connections with Southeastern market areas. These locations would also be in a favorable position for receiving South American manganese ore, essential in the production of many types of steel. The industry presently imports some 90 per cent of its manganese requirements. Among the study area's ports, Port St. Joe has the deepest entrance channel at present, while Brunswick and Savannah have particularly good transportation connections with their hinterland. All have access to the inland waterway system -- the former for reaching a number of markets in Basins 7 and 8, and the latter two for reaching markets in Basin 1. Development of additional rivers for navigation would enlarge the water transportation possibilities.

## "Water Problem" Manufacturing Potentials by River Basin

The potentials of manufacturing industries selected from the standpoint of their outstanding water intake needs or their waste disposal problems are summarized below by river basin and in terms of new plants or expansions (new plant equivalents). They are identified by three-digit Standard Industrial Classification numbers and descriptions, unless otherwise noted. The numbers in parentheses following the brief industry descriptions are the S.I.C. numbers, as revised in 1957. Employment estimates are based on Census of Manufactures tabulations showing the frequency distribution by size of establishment for each industry in terms of numbers employed (1 to 19; 20 to 49; and so on). Estimates of the number, general size category, and general location of the expected new plants (or their equivalents in expanded units) are those of the Industrial Development Branch. In terms of total additional employment in these special categories of manufacturing, the estimates indicate that gains will be largest in the Apalachicola, Savannah, and Perdido-Escambia basins.

<u>Basin Number and Name</u>	<u>Above Fall Line</u>	<u>Below Fall Line</u>	<u>Total</u>
1 Savannah	1,340	1,970	3,310
2 Ogeechee	--	20	20
3 Altamaha	125	750	875
4 Satilla-St. Marys	--	280	280
5 Suwannee	--	420	420
6 Ochlockonee	--	490	490
7 Apalachicola	1,730	3,040	4,770
8 Perdido-Escambia	--	3,000	3,000
Total, study area	3,195	9,970	13,165

### Savannah River Basin

Among the industries in the foregoing lists, four are expected to contribute to economic development above the Fall Line, in the Piedmont and Blue Ridge portions of this basin. The additional manufacturing establishments include three broadwoven fabrics mills (S.I.C. 223) of average

size, employing an estimated total of 1,080 people; one small plant making soap and related products (284), employing an estimated 10; two small plants fabricating structural metal products (344) employing a total of about 20; and three plants making communication equipment (366), one of average size and two small ones, employing a total of approximately 230 people.

In portions of the basin below the Fall Line, including the Augusta-Aiken area which overlaps to some extent, numerous additional manufacturing units are expected. These include a large mill in the pulp, paper and board industry (S.I.C. 261), employing perhaps 1,000 people; one medium and two small related plants in the "pulp, paper, and products, n.e.c." category (269), employing an estimated total of 100; one relatively small petroleum refinery (291), employing about 60; an additional sugar mill (206) of average size, employing some 220 people; one small plant making soap and related products (284), employing about 30; two average-size plants making paints and allied products (285), employing an estimated total of 80; a paving and roofing materials plant (295) of average size, employing about 40; a relatively small steel mill (331) using a direct-reduction process and imported ores and employing about 200; a nonferrous rolling and drawing mill (335) of average size, employing some 100; five structural metal products plants (344), including three small establishments and two of average size, employing a total of about 110; and two small plants making communication equipment (366), employing an estimated total of 30 persons.

#### Ogeechee River Basin

No plants in the listed categories are expected in the very minor portions of four Georgia counties lying above the Fall Line in this basin. Below the Fall Line, the area should gain two small plants making structural metal products (344), employing an estimated total of 20 people.



### Altamaha River Basin

Economic development in the upper portion of this basin is expected to be strongly influenced by the continuing substantial growth of the Atlanta Standard Metropolitan Area. Further growth of the Athens area and new growth bands to be created with the completion of two new national highways running northeast and southeast from Atlanta will also be important plus factors.

Expected additional manufacturing units include two small plants in the "pulp, paper, and products, n.e.c." category (269), employing a total of about 30; one plant of average size making paints and allied products (285), employing an estimated 40; one structural metal products plant (344) of average size, employing some 40 people; and one small establishment making communication equipment (366), employing about 15.

In Macon and below the Fall Line, anticipated growth includes one average-size plant making pulp, paper, and board (261), employing about 300; one in the miscellaneous pulp and paper products field (269), employing about 70; a relatively small petroleum refinery (291), employing about 60; a paving and roofing materials plant (295) of average size providing some 40 jobs; a cement mill (324) of average size, employing about 250; and three small structural metal products plants (344), employing an estimated total of 30 people.

### Satilla-St. Marys River Basin

Anticipated additions to manufacturing in this basin include two meat products plants (201) of small-to-average size, employing a total of about 120 people; one gum and wood chemicals plant (286) of average size, employing an estimated 80; and one small aircraft parts factory (372), providing some 20 new jobs.

### Suwannee River Basin

The next forty years are expected to bring to this basin two meat products plants (201) of small-to-average size, employing a total of some 70; two canning and preserving plants (203) of average size, employing approximately 180; one gum and wood chemicals plant (286) of medium size, employing about 60; one small and two average-size structural metal products mills (344), employing a total of about 90; and one small aircraft parts factory (372) with some 20 new jobs.

### Ochlockonee River Basin

Increases in cattle raising and commercial vegetable growing are expected to provide much of this basin's gains in manufacturing. Two small meat products plants (201) and three small-to-medium size canning and preserving plants (203) should employ about 30 and 180, respectively. Three structural metal products establishments (344), small to average, are expected to provide a total of about 80 jobs, and one communication equipment plant (366) of average size should add about 200 jobs.

### Apalachicola River Basin

Among the eight river basins, this one has the strongest economic base and is also apt to see the greatest growth. The portion above the Fall Line, including most of the Atlanta Standard Metropolitan Area, is expected to gain a variety of new and expanded manufacturing units. These include four establishments, mostly small, in the "pulp, paper, and products, n.e.c." classification (269), employing an estimated total of 125; some 15 small drugs and medicines establishments (283), employing about 150 in all; two small plants making soap and related products (284); two average-size plants and one small plant making paints and allied products (285), employing about 90; three small-to-average nonferrous rolling and drawing mills (335) employing a total of about 200; three small and three

average-size structural products plants (344) employing a total of approximately 150; one large and one small communication equipment plant (366) employing about 215; and one additional large aircraft and parts factory (372) providing some 800 new jobs.

In the Columbus area and below the Fall Line much new industry is anticipated. Within the categories under study these include two small meat products plants (201) employing a total of about 30; two pulp, paper, and board mills (261) of average size, employing approximately 600; two large plants producing industrial inorganic and organic chemicals (281), employing some 1,400 people; one small plant in the "chemical products, n.e.c." category (289) making insecticides and employing about 10; one cement mill (324) of average size, employing about 250; one tin can factory (341) of average size, employing some 240; two average-size and three small structural metal products plants (344), providing a total of about 110 jobs; one communication equipment plant (366) of average size, employing about 200; and two average-size aircraft parts factories (372) adding some 200 new jobs.

#### Perdido-Escambia River Basin

Much of the industrial growth anticipated for this basin is oriented to military establishments in the Florida Panhandle and to existing manufacturing in and near Pensacola. Additional manufacturing units also include two small meat products plants (201) employing about 30; plus three small plants and one average-size plant engaged in canning and preserving (203), employing a total of about 150. The area's forestry and other resources should provide two additional pulp and paper mills (261) of average size, employing about 600; five plants, mostly small, in the miscellaneous pulp and paper products category (269), employing approximately 140; two large basic chemicals (281) units employing about 1,400; three

paint-making plants (285), ranging from small to large, employing a total of some 140 people; one small plant in the miscellaneous chemicals category (289) employing about 10; one average-size petroleum refinery (291), probably at Port St. Joe, employing some 370; two small structural metal products mills (344) affording about 20 new jobs; and three aircraft parts establishments (372), two small and one of average size, employing a total of about 140 people.

## Other Manufacturing Potentials

### Chemical Utilization of Wood and Wood Wastes

During the 1960 to 2000 period it is entirely possible that a major technological breakthrough will occur in the chemical utilization of wood residues. This breakthrough is envisioned as a method which will permit the splitting of the long cellulose and lignin molecules into small molecules (with a maximum of, say, six to nine carbon atoms). The resulting light carbon-hydrogen and carbon-hydrogen-oxygen compounds could then be used for synthesizing "petrochemicals" with known processes. That is, the resulting basic chemicals would substitute for the petroleum-based chemicals. It seems reasonable to expect that the same process would also yield some coke and small quantities of light and heavy oils.

The study area is one of the most important lumber and pulpwood producing areas of the country. It has available tremendous quantities of wood residues, such as sawdust, bark, slabs, and stumps. Once the technological breakthrough has occurred, the area can become a natural home for an industrial complex based on wood residues. At that time the area's important wood-based chemicals can serve as basic building blocks for synthetic fibers and plastics industries.

### Plastics

It appears almost certain that within the period of 40 years envisaged by the present study plastic materials will be adopted for many uses in home construction. Some of these are pipe, panels, foam insulation, roofing, and prefabricated sections. This development will generate a phenomenal increase in the demand for plastic products. Since many of these products will be bulky and expensive to transport, it may be anticipated that the area will see a great increase in the number of plastic

processors. These will be likely to concentrate around the larger centers of population -- Atlanta, Augusta, Columbus, Macon, Pensacola, and Savannah. As a result of increased plastics production, the area will become an important consumer of the resins from which the plastics are made. The entrance of even a modest petrochemicals industry in the area -- a distinct possibility -- would lead to the production of resins for plastics at adjacent locations.

### Synthetic Fibers

Most experts agree that true synthetic fibers (the noncellulose fibers) will continue their spectacular growth, partially displacing cotton, wool, and rayon in textiles. Furthermore, it appears likely that they will displace rayon as the raw material for tire cord. Consequently, it is estimated that the country's output of synthetic fibers will triple by 1975.

Synthetic fiber plants tend to be market-oriented. The portion of the study area lying in the Piedmont Province is reasonably close to the center of the great Southeastern textile concentration. This is therefore a strong factor favoring the expansion of existing synthetic fiber plants and the location of new ones. Raw materials for these fiber plants must now come from petrochemical centers on the Gulf Coast and in the Northeast. The availability of cheap barge transportation for delivery of these bulk raw materials should be an important factor in determining the locations of future fiber plants. Thus an inland waterway port near the Piedmont textile area has much to offer. From this standpoint, Augusta and Columbus in Basin I and Basin VII, respectively, have excellent prospects. The development of one or more petroleum refineries at Brunswick or Savannah should further enhance Augusta's advantages. In addition, new plants or enlargements of existing facilities in the Pensacola area are to be expected during the next 40 years.

## Fertilizers

Fertilizer consumption in the study area is expected to increase during the next 40 years at a steady rate. Three reasons for the expected increase are:

- (1) Use of a larger amount of fertilizer per acre.
- (2) Increase in the acreage of fertilizer-using crops.
- (3) Use of fertilizer in forestry, perhaps after 1980, to increase the yield per acre per year.

One of the main fertilizer-consuming crops in the area has been cotton. Cotton acreage is decreasing, but the acreages of other heavy fertilizer users such as corn and pasture are on the increase. Furthermore, estimates from available data indicate that actual levels of fertilizer consumption for main crops in the study area are not as high as have been recommended. In many cases the consumption is less than half the recommended usage. There thus appears to be considerable room for the expansion of consumption.

The basic raw materials for chemical fertilizer production contain one or more of three elements or compounds -- nitrogen, phosphorous pentoxide, and potash (potassium oxide). To these sulfur must be added in the form of sulfuric acid, to convert the naturally occurring insoluble phosphates into soluble superphosphates. Also, for many soils, calcium must be added.

The study area is in a good supply position for these principal raw materials, with the exception of potash. Nitrogenous materials, both solid and liquid, are being produced at Savannah and Pensacola. Phosphorus is available from the phosphate rock deposits of Florida and Tennessee. Potassium salts are mainly imported from Europe or transported overland

from New Mexico. When the method now used in Norway is further perfected, potassium salts can be recovered from sea water.

The fertilizer industry in the study area comprises a large number of mixing plants and a few manufacturing plants. Most are in the Coastal Plains Province. They serve an important market. Each of the states represented in the study area was among the ten leading states ranked according to fertilizer consumption in 1948 and 1958, as shown by statistics of the National Fertilizer Association and the U. S. Department of Agriculture. However, there was a decrease in the actual consumption between 1948 and 1958 in Alabama, North Carolina, and South Carolina.

The study area's major market areas for fertilizer used on pastures, crops, and commercial forests are the Coastal Plains areas in south Georgia, north Florida, and south Alabama. The Pensacola area is favorable for the assembly of the major raw materials. The Savannah and Brunswick areas are also favorable for some of the raw materials, but are less favorable for phosphate rock and sulfur.

#### Refractories

A steady increase in the demand for refractories is generally expected. This expectation is based on the nation's rapidly increasing power requirements. These call for many new conventional or nuclear boiler plants, which in turn need refractories. Neither the clays for making the refractories nor the refractories themselves permit transport over long distances (except perhaps by ocean or other water transport). This forces the manufacturers to look for locations close to raw material deposits and not too far from their markets.

The study area has deposits of fire clay, an ingredient of some types of refractories. Another raw material, zirconium oxide, is available from Florida beaches in the area or can be brought in by ocean freighter from



Brazil. Since the area's consumption of refractories will go up at a rate at least equal to the national rate of increase, the area has definite possibilities of producing certain types of refractories. Manufacturers using fire clay generally seek locations near the deposits or elsewhere along the Fall Line. Refractories based mainly on zirconium oxide as a raw material will probably concentrate near the coast or along navigable rivers like the Apalachicola and its tributaries, or the Savannah.

#### Other Products

Numerous additional lines of manufacturing are expected to be introduced, or to expand, within the four decades ahead. Many of these have special locational requirements which afford at least a rough indication as to which basin segments are likely to be found most suitable. Such location indicators are shown following the industry or product listing, with the caution that the variables in any specific locational decision can easily change the pattern of probabilities. Some product lines can find more or less suitable locations in all of the basins. The designated products or industries, except for the ones followed by an asterisk (\*), are among those for which the Industrial Development Branch has made special feasibility studies. Available studies of manufacturing possibilities for portions of the study area outside Georgia have also been consulted.

In a region outstanding for its forestry resources, it is not surprising to find many wood-using industries among the manufacturing potentials. Apart from those discussed elsewhere in this chapter from other standpoints, these include:

- Wood flour and molded wood products -- especially in Basin 5;
- Wood particle board -- especially for certain areas in Basin 7;
- Wood pallets -- suggested for Basin 3 and for Basin 7 above the Fall Line;
- Hardboard and insulation board -- Coastal Plain areas, especially Basins 1, 2, and 7;

Wood furniture;  
Paperboard containers -- Atlanta area, plus alternative locations  
in Basins 4, 5, and 6;  
Prefabricated houses -- Atlanta area, Basin 5, and Basin 7 below  
the Fall Line.

Mobile homes, already produced in several locations throughout the study area, will probably continue to be produced at additional establishments. Basin 5, in particular, is expected to obtain some of this growth.

Electronics production is a good future possibility for the study area, especially in the Atlanta area and in the Florida portions of Basins 6 and 8. The manufacture of room air conditioners is an additional and related potential for the Atlanta area.

Potentials in the food products field include dairy products (\*), particularly near the study area's major cities in practically every river basin. Additional seafood processing (\*) is expected in the coastal areas of Basins 3, 6, 7, and 8. Honey production and processing (\*) should grow in Basins 6, 7, and 8.

It appears likely that each basin can gain more apparel plants (\*) and more boat building establishments (\*). The latter, of course, may be expected to cluster fairly near the coastal and inland recreational areas. These abound in Basins 1, 3, 4, 7, and 8.

Ceramic floor and wall tile and vitreous china sanitary ware plants are logical new industries for one or more of the three major Fall Line cities. Macon and Augusta are nearest the raw materials.

Light metal castings offer manufacturing possibilities for the Atlanta area in particular, and custom die casting shops are needed by and suitable for numerous smaller communities scattered throughout the eight river basins.

## Nonmanufacturing Development Potentials

Employment projections for the study area<sup>4/</sup> indicate that continuing decreases in farm jobs from 1960 to 2000 will be far more than offset by increases in manufacturing and other nonagricultural employment. Manufacturing is expected to supply not much more than a fourth of this 40-year increment of 2,092,500 nonfarm jobs, though its indirect multiplier effects will contribute much to the impressive gains expected in trade, government, services, construction, finance, insurance, real estate, transportation, communications, and public utilities.

### Estimated Distribution by River Basin

The distribution of the projected total increase in nonmanufacturing jobs by state segments, then by state sub-basins, was estimated mainly by use of these areas' ratios of projected gains in total employment from 1960 to 2000, with comparatively minor adjustments of these percentages in some instances. This procedure was supplemented by a further division of the derived totals for basins 1, 3, and 7 for the portions above and below the Fall Line, mainly on the basis of early Census estimates by county of population in 1960, with modifications suggested by the locations of the more rapidly growing areas. The resulting allocations of total 1960-to-2000 gains in nonagricultural nonmanufacturing (NANM) employment are given below, in thousands.

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<sup>4/</sup>See Section J, "Economic-Statistical Projections," by John L. Fulmer.

<u>Basin number and name</u>	<u>Above Fall Line</u>	<u>Below Fall Line</u>	<u>Total</u>
1 Savannah	67.8	148.3 (a)	216.1
2 Ogeechee	(b)	0.6 (c)	0.6
3 Altamaha	125.0	90.0 (d)	215.0
4 Satilla-St. Marys	--	29.9	29.9
5 Suwannee	--	45.8	45.8
6 Ochlockonee	--	36.9	36.9
7 Apalachicola	480.0	180.2 (e)	660.2
8 Perdido-Escambia	--	312.8	312.8
Study area, total	672.8	844.5	1,517.3

- Notes: (a) Includes Augusta-Aiken area and Chatham County, Georgia.  
 (b) Negligible.  
 (c) Total employment is expected to decline, but it is anticipated that modest gains will occur in manufacturing and in NANM employment.  
 (d) Includes Macon.  
 (e) Includes Columbus.

#### Potentials by Industry Division

Analysis of the study area's industrial structure in terms of employment, and comparison of this structure with that for the country as a whole, indicates a relatively strong position in the study area for manufacturing, trade, government, and construction. These comparisons are based on Bureau of Labor Statistics employment data for the United States in 1950 and 1957 and estimates for the study area developed by the procedures outlined in Section E of this report. Each major industry division's share of the total in 1950 and in 1957 was averaged arithmetically in order to portray a somewhat more stable set of relationships than would appear from a single year. For most industry divisions, the structural divergencies between the study area and the national pattern were in the same direction in 1950 and 1957, differing only in degree. Exceptions among

the study area's strong components were trade and construction, each of which advanced from sub-average to above-average relative to the nation from 1950 to 1957.

The study area's weak industry divisions in both 1950 and 1957 were mining; transportation and public utilities; finance, insurance, and real estate; and services. However, in most of these categories the study area has been in the "catching-up" process for the longer period of 1939 to 1957. Its compound annual rate of growth in each major industry division, weak and strong alike, was higher for the 1939-1957 period than the corresponding national rate, except in the cases of services and construction.

Compound Annual Percentage Rates of Gain in Nonfarm  
Employment by Industry Division, 1939 to 1957

	Study Area (est.)	U. S. Total (BLS)
Total nonagricultural employment	3.7	3.1
Mining	1.5	-0.3
Contract construction	4.3	5.1
Manufacturing	3.3	2.9
Transportation and public utilities	2.6	2.0
Wholesale and retail trade	4.5	3.0
Finance, insurance, real estate	5.9	2.9
Service and miscellaneous	3.1	3.6
Government	4.0	3.6

To estimate the industry division breakdown of the total projected gain in NANM employment, 1960 to 2000, certain assumptions were made and several sets of factors were used as allocating devices. The main assumption is that the pattern of projected gains by industry division in the country as a whole from 1957 to 1975, particularly as among the NANM components, will hold true in general until the year 2000. Unpublished government estimates for the 1957-1975 period, made available by the U. S. Bureau of Labor Statistics, were used as one of the three main allocating devices. By this procedure, the gain in number of workers for each relevant

industry division as compared with the total NANM gain yielded the initial ratio for each industry division. These initial ratios were first modified by two separate sets of factors reflecting (a) the study area's industrial structure (simple average for 1950 and 1957) relative to the national structure, and (b) each industry division's growth in the study area relative to the national average, for 1939 to 1957, expressed as an index of the compound annual rate of increase in the study area to the corresponding national average rate of increase. The study area's relative industrial structure was also expressed as an index. (In trade, for example, the study area's employment represented over 33 per cent of total NANM employment, while in the country as a whole it was about 32 per cent; the computed study area index was 104.) The two foregoing indexes were combined into one index, by dividing their product by 100.

In addition, adjustment factors were applied in certain situations. For economic activities in general, and particularly in most or all of the NANM categories, it is believed that a saturation factor comes into play at intervals or stages of development. Most of these industry divisions (mining is probably one exception) comprise economic functions which are fundamentally the same or similar from region to region. Their relative importance in the region may, and often does, vary from that in the nation; but the gap seldom remains huge over long periods, and it is more likely to narrow over time than to widen. So long as employment in finance and related activities remains well under 10 per cent of nonfarm employment in the nation, it is unlikely to climb to 20, 30, or 40 per cent in any fairly large region. Thus, to take some account of the saturation factor, it was arbitrarily assumed that when both the structure index and the growth index for a particular industry division in the study area exceeded 100 and either index exceeded 110, the saturation factor will come into play

in the future. To adjust, the sum of amounts by which the factor(s) exceeded 110 was deducted from the computed combined index to effect a downward adjustment.

An adjustment in the opposite direction was made to take account of what might be called the vacuum factor. In an area where economic growth and development are proceeding, an upturn can reasonably be expected in a situation where the industry division (other than mining) is a deficit one in terms of both structure and prior growth. Thus, as in the case of the services and miscellaneous category, when both the structure index and the growth index were below 90, the sum of such deficits was added to the computed combined index to effect an upward adjustment.

The sum of the percentages so computed exceeded 100. Reduction of the excess was prorated among the three industry divisions which exceeded the corresponding national percentages by the widest margins -- finance, insurance, and real estate; trade; and government.

Application of the methods described above resulted in the following estimated breakdown of total NANM gains for the study area from 1960 to 2000. The major industry divisions are listed in descending order of magnitude.

<u>Industry division</u>	<u>Thousands of new jobs</u>
Wholesale and retail trade	523.6
Government	350.2
Service and miscellaneous	242.9
Finance, insurance, real estate	184.8
Construction	155.4
Transportation and public utilities	58.0
Mining	2.4
Total, NANM	1,517.3

#### General Pattern of Growth Potentials by Industry and Area

Further absolute and relative gains in the study area's strong position in wholesale trade are expected, with Atlanta and lesser wholesaling centers

serving a region still in the process of closing a large gap in its proportionate share of the national income. Growth in retailing is expected to correspond closely with population growth and increases in per capita income. The sharpest retailing gains can be expected to occur in the outlying portions of such rapidly growing metropolitan areas as Aiken-Augusta, Savannah, Atlanta, Macon, Tallahassee, Columbus, Albany, and Pensacola. In addition, cities likely to grow to standard metropolitan area size before the year 2000 include Anderson, South Carolina; Athens and Brunswick, Georgia; Dothan, Alabama; and Panama City, Florida.

The anticipated large increases in government employment reflect the continuation of a recent trend that has been marked by increases in many public services. The study area contains two state capitals and the federal administrative headquarters for a great many regional and a few national functions. Moreover, it should share in the nationwide growth in demand for services in such fields of public responsibility as education, health, protection from major physical hazards, and the furnishing of public utilities.

Services employment in the study area has been sub-average in the study area, as a proportion of the total and in rate of growth. Anticipated gains are conservative in relation to expected national gains, but they are large in absolute terms and they reflect a pickup in the area's growth rate. As income levels rise, more disposable income is likely to be budgeted for a wide array of personal, business, and professional services. Educational facilities and services should advance more rapidly, given locally acceptable solutions to current vexing problems which have been exacerbated by political forces intolerant of regional cultural diversities.

The study area's employment gains in finance, insurance, and real estate from 1939 to 1957 have been the highest of any industry division



on a percentage increase basis. Still a "deficit" industry relative to the national pattern as late as 1957, further significant gains are anticipated. Within 40 years, it is expected that this category will have about the same relative importance in the study area as in the national economy.

Anticipated future growth rates in construction, transportation, and public utilities do not differ significantly from the corresponding rates projected for the country as a whole. In terms of past growth and present status in the study area, gains in construction will be substantial -- more than double the estimated present employment. Expected gains in transportation, though slightly above the national rate, are of much smaller magnitude. Communications and utilities tend to follow population growth rather than to lead it. Expected increases in air, highway, and perhaps water transportation employment are likely to offset continued losses in railroad and other transportation employment.

The distribution by river basin and physiographic province of the foregoing industry growth potentials may be expected to follow generally the pattern of area distribution indicated for total gains in NANM employment. That is, the bulk of the gains in such important categories as trade, services, finance and related activities, and construction can be expected to accrue to Basins 1, 3, 7, and 8. Gains in transportation, communications, and public utilities -- as distinct from cumulative total employment -- may follow a somewhat modified pattern, occurring as they may in newly developing areas such as the Coastal Plain portion of Basin 7. Even in this instance, deviation from the overall distribution is more likely to be within basins than between them. Mining is perhaps the most likely exception to the general pattern, since any correspondence of its areal distribution with that of general economic activity is usually quite accidental. Local government employment tends to be dispersed more in

accordance with the distribution of political subdivisions than with population distribution. Employment increases in the state and national governmental agencies, however, are likely to be concentrated heavily in Basin 6 (Tallahassee) and in the Atlanta area (above the Fall Line, in Basin 3 and Basin 7).

The employment projections and estimates derived from them relate to civilian employment. However, the economic importance of defense establishments in the study area should not be overlooked. One or more large installations exist in practically every river basin under study. Apart from their prime purposes, they are important local economic factors in the Augusta and Savannah areas of Basin 1; Atlanta area, Basins 3 and 7; Macon area, Basin 3; Columbus and Albany areas, Basin 7; Dale County, Alabama, Basin 8; and in the Panama City and Pensacola areas of Basin 8. From at least a short term local point of view, they have done more to bolster some local economies than any other single factor. During the next 40 years, their presence and normal growth, combined with other favorable factors such as research facilities and expanded vocational training programs, should do much to attract new manufacturing enterprises in the electronics field and in other defense-related industries.