

THE INDUSTRIAL MIX OF EMPLOYMENT IN THE FIFTH DISTRICT, 1950-1985

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The industrial distribution of employment in the United States has undergone significant changes over the years. Once predominantly agricultural, the nation's workforce first shifted from farming to mining and manufacturing, and then from producing goods to producing services. The concentration of employment also has changed substantially within major industrial classifications, such as from smoke-stack to high-tech manufacturing.

Regions within the United States generally display the same major industrial shifts in employment that have occurred in the nation as a whole. But regional economies do exhibit significant differences in employment growth by industry and industry subgroups. A regional analysis of the industrial distribution of employment can therefore provide important insights into the development and current character of an area's economy. Such information may be of use to state and local officials and to other citizens in their efforts to attract industry and promote growth. It is also of interest to citizens wishing to know why, how, and how much the employment mix in a region has changed.

This article describes and analyzes the principal changes in nonagricultural employment in the Fifth Federal Reserve District during the past 35 years, with emphasis on more recent years. The main finding is that the employment trends in the Fifth District are similar to those of the nation, except that the percent of manufacturing employment has not declined as rapidly in the District as in the nation. The first section reviews developments in the United States as well as in the District and points out where differences are significant. The second section analyzes changes in the industrial employment mix. The third section focuses on employment changes in industry subgroups within the manufacturing and service sectors, again using national trends as a basis

for evaluating Fifth District developments. The fourth and final section summarizes the findings and discusses some implications for the District.

I.

POSTWAR INDUSTRIAL EMPLOYMENT GROWTH

Since the end of World War II, total nonagricultural employment in the United States has increased greatly. Over that same period, dramatic shifts have occurred in the percentages of workers employed in specific sectors or industries and in the regional concentration of employment by industry. While the Fifth District's postwar changes in employment broadly reflect those of the nation as a whole, there are important differences.

The analysis focuses on changes from 1946 to the present.¹ However, since trends are the topic of interest here, the years used for comparative purposes are chosen to minimize the effects of the business cycle. Thus, most of the comparisons are based on employment data for 1950, 1972, 1978, and 1985--all years of economic expansion that occur within three years after a business cycle trough.

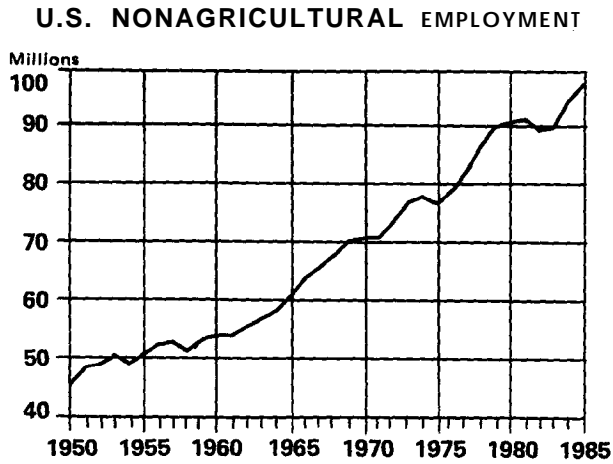
Total Employment

The pronounced increase in nonagricultural employment in the United States during the past 35 years is shown in Figure 1. The doubling in jobs over this period translates to an average annual growth rate of 2.2 percent.

¹This analysis is based primarily on annual data from the U. S. Department of Labor. The data, known as the "payroll series," provide detail on employment by industry and state. The labor force data are obtained from "establishment surveys." That is, a firm operating in more than one location must submit a report for each establishment. In addition, firms engaged in distinctly different lines of activity are required to submit separate reports, if possible. For definitions of terms, area samples used, historical comparability of the data, comparability with other series, etc., see Department of Labor, Bureau of Labor Statistics, "Employment, Hours, and Earnings."

* The author thanks Dan M. Bechter for his invaluable comments.

Figure 1



NOTE: District employment growth reflects the growth pattern in the United States.

Employment in the Fifth District also more than doubled between 1950 and 1985. Jobs in the Fifth District grew at an average annual rate of 2.6 percent, with Virginia posting the strongest gain, followed in order by North Carolina, South Carolina, Maryland, the District of Columbia, and West Virginia. (See Table I.) To be sure, over the more recent period from 1972 to 1985 employment growth slowed in both the nation and the Fifth District. But the District rate remained above that of the nation, although not by as great a margin as was recorded from 1950 to 1972.

Table I

GROWTH IN EMPLOYMENT

	Average annual rates		
	1950-72	1972-85*	1950-85*
United States	2.25	2.19	2.22
Fifth District	2.67	2.36	2.55
District of Columbia	0.64	0.73	0.67
Maryland	3.14	2.23	2.80
North Carolina	3.34	2.53	3.04
South Carolina	3.19	2.69	3.00
Virginia	3.33	3.05	3.23
West Virginia	0.14	0.76	0.37

* 1985 is a preliminary figure.

Growth differences among geographical regions occur for various reasons. Since World War II, the Fifth District labor supply has increased faster than that of the nation because of a higher District birth rate in the 1950s and a migratory movement toward the South in the 1960s and 1970s.³ Other factors contributing to growth differences among geographical areas will be considered later.

From Goods to Services

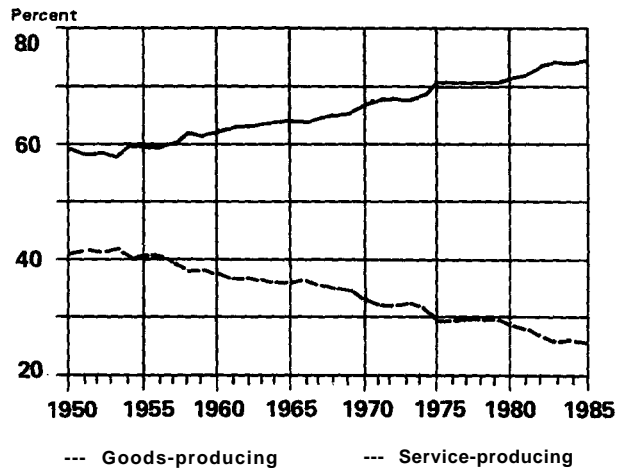
A major trend in the employment mix over the last century has been a shift from goods-producing to service-producing industries.³ As shown in Figure 2, employment in service-producing industries has grown significantly relative to employment in goods-producing industries in the United States. The same trend has occurred in the District. The change in employment reflects different rates of growth in productivity and demand which will be explained further in Section II.

² For more explanation of the labor force composition, see Lynn E. Brown, "Regional Unemployment Rates-Why Are They So Different?" *New England Economic Review*, July/August 1978, pp. 9-11.

³ The mining, construction, and manufacturing sectors are often referred to as goods-producing because their products are tangible while the remaining sectors are collectively termed service-producing.

Figure 2

EMPLOYMENT DISTRIBUTION OF GOODS AND SERVICES IN THE UNITED STATES



NOTE: The change in employment distribution of goods and services in the District reflects that of the United States.

The United States and the District have been service economies in terms of employment since the early 1900s when over 50 percent of the work force became employed in service-producing industries. The trend toward services, however, has become more rapid since the 1950s. In fact, the U. S. service-producing sectors have as a group grown at an annual average rate of 2.9 percent between 1950 and 1985, while the goods-producing sectors have grown 0.9 percent per year. Within these two classifications, employment growth rates by individual sector vary considerably.

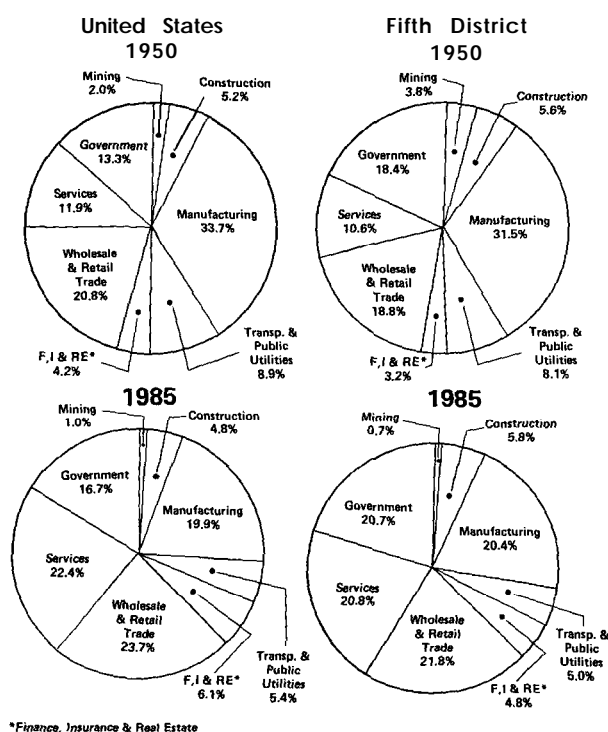
Sector by Sector

Figure 3 displays changes in the relative distribution of employment in the United States and the Fifth District by major industrial sector. (See Box.) Clearly evident is the great increase in the relative number of service sector employees.⁴ The service sector has become the second largest employer in the

⁴The service sector is defined more narrowly here than in the previous section.

Figure 3

EMPLOYMENT SHARE BY MAJOR SECTOR



nation and the District, growing between 1950 and 1985 at an annual average rate of 4.1 and 4.5 percent, respectively.

In contrast, the relative share of the manufacturing sector has declined considerably. In 1950, U. S. manufacturing jobs comprised 33.7 percent of non-agricultural employment, but they declined to about 19.8 percent in 1985. By comparison, the District had 31.5 percent of its employees in the manufacturing sector in 1950 compared with only 20.4 percent in 1985. Despite the gradual decline in the manufacturing sector share of total employment, there has been an increase in the number of workers employed. Between 1950 and 1985, U. S. manufacturing employment rose 27 percent while the Fifth District gain was nearly 57 percent.

A comparison of industry sector growth in the Fifth District with that of the United States between 1950 and 1972 reveals that the District gained employment more rapidly than the United States in all industries except mining and government. Both the nation and the Fifth District experienced trends in industry employment over the last 13 years that differed from their counterparts between 1950 and 1972. As shown in Table II, the growth rate of nonagricultural employment, national as well as District, slowed between 1972 and 1985. Among the various sectors, employment in mining, transportation and public utilities, wholesale and retail trade, and service grew faster in the last 13 years while employment in construction, manufacturing, and government, grew considerably more slowly. When the District's industry sectors are examined relative to the nation's from 1972 through 1985, slower growth rates are found in the District's mining and finance, insurance, and real estate sectors.

II. ANALYSIS OF CHANGES IN INDUSTRIAL EMPLOYMENT MIX

The growth of employment in various sectors and regions differs dramatically. This section offers some explanations for the different rates of employment growth in the nation's manufacturing and service sectors and for the interregional disparities in these rates of growth.

Explanations of Manufacturing and Service Sector Shifts

The industrial composition of U. S. jobs depends primarily on two factors : the type and mix of goods

Industrial Classifications

The Standard Industrial Classification (SIC) system defines sectors on the basis of such factors as end-product similarity, types of resources used, and types of customers. The eight major SIC manual sectors are:

- Mining - Businesses extracting minerals occurring naturally such as coal, ores, crude petroleum, and natural gas. Also included are operations necessary to make minerals marketable.
- Construction - Builders and other fabricators producing new work, additions, alterations, and repairs including special trade contractors, such as plumbing, painting, and electrical work.
- Manufacturing - Firms performing mechanical or chemical transformations of materials or substances into new products.
- Transportation and Public Utilities - Establishments providing passenger and freight transportation, communication services, electricity, gas, steam, water or sanitary services, and the U. S. Postal Service.
- Wholesale and Retail - Places of business primarily engaged in selling merchandise for personal, household, industrial, commercial, institutional, farm, or professional business consumption, as well as firms engaged in the sale of goods to other wholesalers.
- Finance, Insurance, and Real Estate - Establishments providing specialized activities in either the finance, insurance, or real estate field.
- Service - Establishments providing a wide variety of services for individuals, business and government establishments, and other organizations.
- Government - Organizations performing the legislative, judicial, administrative, and regulatory activities of federal, state, local, and international government.

Table II
EMPLOYMENT GROWTH BY SECTOR

Average annual rates

	United States		Fifth District	
	1950-72	1972-85*	1950-72	1972-85*
Total Nonagriculture	2.25	2.19	2.67	2.36
Mining	-1.63	3.07	-3.06	-0.56
Construction	2.29	1.45	3.30	1.53
Manufacturing	1.04	0.07	1.94	0.20
Transp. and Public Utilities	0.54	1.11	0.92	1.49
Finance, Ins., and Real Estate	3.36	3.29	4.17	3.06
Wholesale and Retail Trade	2.44	2.89	2.78	3.34
Service	3.84	4.58	4.24	5.04
Government	3.68	1.61	3.40	2.08

* 1985 is a preliminary figure.

and services desired by consumers, businesses, governments, and foreigners, and the differentials in labor productivity by industry. By explaining the change in the mix demanded and the changes in labor productivity one can indirectly account for the causes of the change in the industrial mix of employment.

One reason for the shift from goods to services production is that people tend to demand more service goods relative to manufactured goods as income rises.⁵ There has been an increase in the proportion of the service sector contribution to the gross national product (GNP) between 1950 and 1984. The real service sector GNP increased from 11.1 percent of total GNP in 1950 to 14.6 percent in 1984.⁶

The relative decline in manufacturing employment also reflects the much faster increase in output per worker in the manufacturing sector than in the service sector.⁷ Labor productivity indices show that productivity growth in the manufacturing sector has exceeded the average rate of productivity growth in the United States since 1960. In other words, the amount of labor required per unit of output fell more rapidly in the manufacturing sector than in other sectors. Consequently, the relatively smaller amount of labor required to produce a unit of output contributes to a relative decline in manufacturing employment.

In support of the productivity argument, Victor Fuchs many years ago argued that the relatively higher cost of manufacturing labor to service labor caused a greater substitution of capital for labor in the manufacturing sector.⁸ In this view, industries react to the cost differential by substituting the lower priced input for the higher priced input, where possible. If manufacturers find it more profitable to substitute capital for labor, then the manufacturing share of employment will decline while employment in other sectors, such as services, will increase. In fact, the average hourly earnings for U. S. manufacturing production workers was \$9.18 in 1984

while service sector nonsupervisory workers earned only \$7.64 per hour. The high percent of unionization in the manufacturing sector has contributed to its relatively high wages. Within the manufacturing sector, union wages increased 11 percent faster than nonunion wages between 1970 and 1984.⁹ Because of the relatively high cost of labor in manufacturing, a greater incentive to substitute capital for labor existed ; hence a shift of the employment shares to the service sector may have resulted.

Explanations of Shifts in Regional Employment

Two determinants influence shifts in the industry mix of a region's labor force. First, there is the "industry factor," defined as the base period industry mix of employment. The historical industry mix affects future changes in employment because some regions possess a larger proportion of the nation's rapidly growing industries. Second, a region's employment changes are explained by the "regional factor," defined as the competitive advantage one particular region has over other regions due, for example, to low-cost inputs for specific industries and access to important markets.

Competitive advantage, via its effect on plant profitability at different sites, influences plant location and thereby regional employment. Numerous studies, which are heavily oriented toward manufacturing, have been conducted to determine the relationship between plant location and regional characteristics. Among the variables reported to have a positive impact on interregional and interstate manufacturing location choice are lower wages, business taxes, personal income taxes, unionization, and higher primary and secondary education spending.¹⁰ Thus employment in regions with attractive characteristics grows relatively faster than regions with unattractive characteristics.

In mining, more so than in other sectors, location and, therefore, employment shifts are dependent upon

⁵ Everett E. Hagen, *The Economics of Development*, Fourth Edition. (Homewood, Illinois: Irwin, 1986), pp. 114-7.

⁶ In the category of goods production manufacturing has held its own, increasing from 21.4 percent to 21.8 percent of GNP over the same period.

⁷ See Victor R. Fuchs, *The Growing Importance of the Service Industries* (New York: Columbia University Press, 1965), pp. 13, 14, and Edward F. Denison, "The Shift to Services and the Rate of Productivity Changes," *Survey of Current Business* 53 (October 1973), pp. 20-35.

⁸ Fuchs, pp. 13, 14.

⁹ Colin Lawrence and Robert L. Lawrence, "Manufacturing Wage Dispersion: An End Game Interpretation," *Brookings Papers on Economic Activity* (1985:1), p. 48.

¹⁰ For a study on wage differentials, see William E. Cullison, "Equalizing Regional Differences in Wages: A Study of Wages and Migration in the South and Other Regions," *Economic Review*, Federal Reserve Bank of Richmond 70 (May/June 1984), pp. 20-33. For an in-depth review of studies on business location decision, see Michael Wasylenko, "Business Climate, Industry and Employment Growth: A Review of the Evidence," *Metropolitan Studies Program*, Syracuse University, Occasional Paper No. 98, October 1985.

the resource site. The District's relative employment decline in mining, however, is primarily due to the decrease in West Virginia mining at an average rate of 2.9 percent annually between 1950 and 1985. There has been a significant increase in coal production in the past decade, but the rapid rise in coal mining productivity has created a decline in employment. In 1944, for example, over 393,000 bituminous and lignite miners produced an average 5½ tons per miner per day for a total production of 619 million tons. In 1980, only 225,000 miners produced over 16 tons per miner per day for a total output of 800 million tons. The relative decline in Fifth District mining employment is also partly attributable to the large increase in surface mining in the western states of the United States.

III.

FIFTH DISTRICT MANUFACTURING AND SERVICE EMPLOYMENT SHIFTS

The most significant employment shifts within the District and the nation have taken place in the manufacturing and service sectors. The remainder of this paper concentrates exclusively on these sectors.

The economic performance of the Fifth District is evaluated by comparing percentage changes in employment of the United States with comparable figures for the Fifth District. The period 1972 through 1985 is chosen for the manufacturing comparison because the 13-year period 1972-1985 is long enough for significant changes to have occurred. Furthermore, both end-point years occur within three years after a business cycle trough. For the service sector comparison, however, the years 1978 and 1984 are the end points because comparable data are not available prior to 1978 or later than 1984.¹¹

The percent change in the District and each of its states is compared to that of the nation. The net employment gain or loss of an area relative to the United States reflects faster or slower growth compared to the nation as a whole. Moreover, the change in composition of each state's manufacturing or service sector indicates which industry subgroups had the greatest impact on the state's total manufacturing or service growth.

¹¹ Tables giving manufacturing employment (1972 and 1985) and service employment (1978 and 1984) by states in the Fifth District and for the District by SIC codes are available upon request from the author.

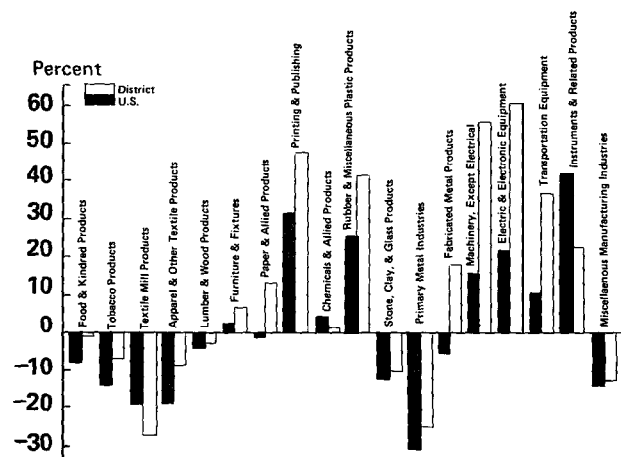
Fifth District vs. United States Manufacturing Employment

At the national level, manufacturing employment gains primarily occurred in high-tech jobs. On the other hand, employment losses were experienced by manufacturers depending most on natural resources. The instruments and related products group—a high-tech manufacturing classification—grew faster than any manufacturing group in the nation with a 40.2 percent employment increase between 1972 and 1985. Large employment increases also occurred in electric and electronic equipment, machinery (except electrical), and printing and publishing. On the other hand, primary metals experienced a 30.7 percent decline in employment followed by textile mill products (18.8 percent), and apparel (18.6 percent).

Figure 4 shows that manufacturing groups within the Fifth District have undergone changes quite different from those of the nation. Employment in the Fifth District grew faster or declined more slowly than in the nation in all but three of eighteen manufacturing industry groups. For example, Fifth District apparel employment declined by 8.8 percent between 1972 and 1985 while apparel employment in the United States declined 18.6 percent. This differential indicates that employment in the national apparel industry though declining overall is tending to be more heavily located in the Fifth District.

Figure 4

MANUFACTURING EMPLOYMENT CHANGES 1972 - 1985



Explanations of Interstate Changes in Manufacturing Employment

Fifth District changes in manufacturing employment seem to be reasonably well explained by business location studies. (See Table III.) Between 1972 and 1985, the largest manufacturing employment increases in the District occurred in North Carolina, Virginia, and South Carolina, where wages, unionization, and corporate taxes are relatively low. Declines in employment have occurred along with correspondingly higher wages, unionization, and corporate tax rates in West Virginia and Maryland. In fact, North Carolina, with the lowest wage and second lowest unionization rate in the District, has become, the nation's most industrialized state, with 31.3 percent of its employees being in the manufacturing sector in 1985. South Carolina was second, with 28.1 percent.

North Carolina experienced the largest increase (9.3 percent) in Fifth District manufacturing employment between 1972 and 1985. To be sure, North Carolina suffered a substantial loss in textile mill employment. However, increases in other manufacturing industries led by transportation equipment and machinery, more than offset that loss. Virginia, a principal supplier to the federal government, enjoyed a 9.2 percent manufacturing employment increase,

helped by large gains in defense and research-related groups, as well as printing and publishing. South Carolina, on the other hand, experienced more balanced growth of 3.1 percent, with gains in all but three of its manufacturing groups.

Manufacturing employment declines in Maryland, the District of Columbia, and West Virginia between 1972 and 1985 appear to be the result of a long-term trend and are greater than the declines currently experienced by the nation. Maryland recorded a decline of 12.7 percent even though large proportions of electric and electronic equipment industries benefited from a strong national market and an increase in defense spending. The District of Columbia witnessed an employment decline of 16.3 percent, and West Virginia suffered a 27.3 percent loss of manufacturing employment with declines in every industry group except machinery (not including electrical machinery) and printing and publishing.

Fifth District vs. United States Service Employment

The U. S. service sector grew 30.7 percent between 1978 and 1984. By far the fastest growing service industry was the private household group, growing over 130 percent during this period. The private

Table III

1985 BUSINESS CONDITIONS FOR MANUFACTURING SECTOR

	Average Hourly Wages	Percent Workforce Unionized	State Corporate Tax**	Annual Average Percent Employment Change 1972-85
United States	9.15	.27		0.07
Fifth District	8.03*	.11*	.062*	0.21
Maryland	9.70	.32	.070	- 1.13
North Carolina	7.30	.05	.060	0.75
South Carolina	7.60	.04	.060	0.25
Virginia	8.50	.12	.060	0.73
West Virginia	10.20	.37	.070	- 2.63

Note: District of Columbia is excluded because data is not available in all categories.

* Weighted average based on the proportion of employment in each state.

** When a two-tier tax system is used, the higher of the two rates is reported.

Sources: The Seventh Annual Study of General Manufacturing Climates, Grant Thornton, June 1986; State Tax Handbook (Chicago: Commerce Clearing House, 1985); and U. S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, various editions and unpublished data.

household group, which includes such services as housekeeping and babysitting, received its stimulus from the increasing number of two-wage earner households that have created a demand for these services. Other groups outstripping the annual average rate for the service sector are business services (54.8 percent), legal services (48.3 percent), social services (36.1 percent), and miscellaneous services (32.6 percent).

The slowest growing service group is membership organizations which increased 5.6 percent between 1978 and 1984 and includes categories such as labor organizations and civic and social associations. The slower growth for this service group reflects a decline in labor organizations.

In general, the District service sector experienced growth patterns similar to the nation but with greater strength. (See Figure 5.) Of the 15 service industry groups, 11 experienced faster growth in the District than in the nation.

Fifth District States

Virginia experienced the largest service employment increase in the Fifth District. A review of Virginia's service sector composition reveals benefits from its proximity to Washington, D. C. Over 25 percent of Virginia's 1984 service employment is in the business service group which provides outputs such as computer and data processing and research and development laboratories.

Maryland experienced the most even distribution of service growth in the District. Growth faster than

the national rate occurred in all of Maryland's service groups with the exception of educational services. That state has also benefited from federal government purchases from local firms. Some of the major categories Maryland supplies are engineering services and medical and aerospace research-development. Similar to other District states, both Virginia and Maryland found much of their 1984 service employment in health services (26.9 percent and 28.2 percent, respectively).

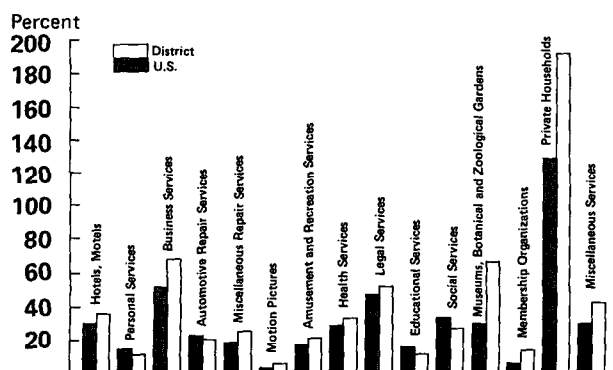
West Virginia experienced the slowest service employment growth in the Region. Only three service groups showed growth rates faster than the nation. In fact, two service groups showed declines of over 15 percent each. Because the state has suffered large manufacturing and mining sector losses, West Virginia's economy is weak. Consequently, service sector growth remains well below the nation as a whole.

The service sector in the District of Columbia reflects a strong presence of the federal government. Service groups such as legal services, business services, membership organizations, and miscellaneous services each comprises over 10 percent of total service employment.

Both North and South Carolina show service sector increases greater than those of the nation. The largest proportion of service employment in both states is found in health services followed by business services. Large service employment increases in South Carolina and North Carolina are found in the amusement and recreation service group and the private household service group.

Figure 5

SERVICE EMPLOYMENT CHANGES 1978 - 1984



IV.

SUMMARY AND CONCLUDING NOTE

The Fifth District has enjoyed rapid employment growth since World War II, as has the nation as a whole. Employment in the District, however, has grown even more rapidly than that in the nation. During the last decade employment growth has slowed in both the Fifth District and the nation, but the Fifth District has grown slightly faster than the nation in the last twelve years. Within the Fifth District, North Carolina, South Carolina, and Virginia have grown faster than Maryland, West Virginia, and the District of Columbia. There is some

evidence that the difference in growth may be attributable to a more favorable business environment in North Carolina, South Carolina, and Virginia, although a complete analysis of the reasons for such employment differentials was beyond the scope of this article.

Changes in the structure of employment differ among industry groups within a particular sector and within particular states because of varying regional characteristics. In the manufacturing sector, industries depending most on natural resources are declining while those depending more on high technology are increasing. Relative to other states in the nation, the District states of North Carolina, South Carolina, and Virginia are experiencing greater increases in

manufacturing employment. The District service sector, on the other hand, more closely reflects the trends of the nation, but has shown larger increases in employment.

Employment in the United States and District economy is likely to continue to become more service oriented. According to Bureau of Labor Statistics employment projections for 1984 through 1995, there will be a further expansion of employment in the service sector and a contraction of the goods-producing sector. Although the service sector will continue to generate most of the new jobs in the economy, the rate of employment growth in the next decade is not expected to be as fast as the period 1973 through 1984.