

North Carolina

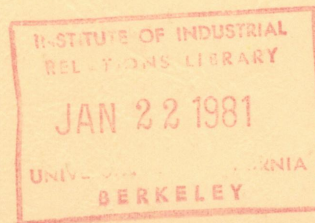
ECONOMICS  
INFORMATION  
REPORT

EMPLOYMENT AND WAGE CHANGES  
IN NORTH CAROLINA *copy*

ROBERT M. FEARN,

PAUL S. STONE

*copy* STEVEN G. ALLEN *///*



(ECONOMICS INFORMATION REPORT NO. 60)  
DEPARTMENT OF ECONOMICS AND BUSINESS  
NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

EIR-60

JANUARY, 1980

Raleigh, Jan. 1980.

# **EMPLOYMENT AND WAGE CHANGES IN NORTH CAROLINA**

Robert M. Fearn  
Paul S. Stone  
Steven G. Allen

Economics Information Report No. 60  
Department of Economics and Business  
North Carolina State University  
Raleigh, North Carolina  
January 1980

## ABSTRACT

This report consists of three parts. In the first part, employment and wage rates in North Carolina are analyzed and compared with those for the United States. Data are provided on industrial and occupational employment, wage rates, manufacturing employment changes by national wage groups, and personal income. The second part is a summary and interpretation of results from previous research studies on factors influencing North Carolina's relative wage levels. Differential levels of schooling, cost of living and unionization were found to explain 88 percent of the difference in North Carolina and national wage levels. In the third part, further considerations associated with economic growth in North Carolina are briefly discussed.

## TABLE OF CONTENTS

	Page
INTRODUCTION . . . . .	5
PART I. TRENDS IN EMPLOYMENT AND WAGES . . . . .	6
Industrial Employment . . . . .	6
Manufacturing Employment . . . . .	8
Occupational Employment . . . . .	10
Wage Rates . . . . .	13
Manufacturing Employment Changes by National Wage Groupings . . . . .	13
Personal Income . . . . .	16
PART II. FACTORS INFLUENCING NORTH CAROLINA'S RELATIVE WAGE LEVELS . . . . .	19
Schooling and Skill Development . . . . .	19
Cost of Living . . . . .	24
Unionization . . . . .	24
Tenure . . . . .	25
City Size . . . . .	25
Other Factors . . . . .	26
Summary . . . . .	26
PART III. FURTHER CONSIDERATIONS ASSOCIATED WITH ECONOMIC GROWTH . . . . .	29
Migration . . . . .	29
Diversity and Magnitude of Choice for North Carolinians . . . . .	31
Cyclical Sensitivity . . . . .	32
Those Left Behind . . . . .	33
Environmental Effects . . . . .	35
REFERENCES . . . . .	36

# EMPLOYMENT AND WAGE CHANGES IN NORTH CAROLINA

## INTRODUCTION

There is widespread interest and concern about relative wage rates and employment opportunities in North Carolina. These variables are important determinants of the level of earnings and economic welfare in the state.

Why are wage rates relatively low in North Carolina? What are the important casual factors? What are the magnitude and significance of changes in employment by industry and occupation on earnings, educational programs and occupational skill training? These are some of the major issues of concern to the citizenry of North Carolina.

The major objective of this report is to provide and interpret information on changes in employment and wage rates in North Carolina and summarize and interpret research results on factors influencing North Carolina's relatively low wage rates. More specifically, the objectives are:

1. To provide data and compare changes in industrial and occupational employment and the relative level and changes in wage rates in North Carolina to those of the nation.
2. To summarize and interpret previous research results on factors influencing relative wage levels in North Carolina.
3. To explore briefly some other implications of economic growth in North Carolina.

## Part I

### TRENDS IN EMPLOYMENT AND WAGES

Changes in industrial and occupational employment in North Carolina are indicative of changes in the state's economic structure and levels of employee earnings, education and skills. In this section the distribution and changes in industrial and occupational employment in North Carolina are compared with those of the nation. This is followed by a comparison between the level and changes in wage rates and incomes in North Carolina and the nation.

#### Industrial Employment

Total employment in North Carolina increased by 535,000 from 1950 to 1970 even with a decline of 266,000 in agricultural employment (Table 1). The most important growth sectors in the state's economy in the fifties and sixties were manufacturing and services with increases in employment of 262,000 and 176,000, respectively. Other important growth sectors were retail trade with an increase in employment of 85,000 and construction, transportation, communication and other utilities, wholesale trade and finance, insurance and real estate with increases of about 40,000 each.

The rate of increase in employment in the state from 1950 to 1970 of 37 percent was the same as for the nation, but there were considerable differences in the rate of change among industrial sectors (Table 1).

✓ Table 1. Change in industrial employment in North Carolina, 1950 to 1970<sup>a</sup>

Industry	N.C. employment		Change in employment, 1950-70		Distribution of employment					
	1950	1970	N.C.	Percentage change	1950					
					N.C.	U.S.	N.C.	U.S.	U.S.	
(000)										
Total	1463.4	1998.8	535.4	37	37	100	100	100	100	100
Agriculture	360.1	94.1	-266.0	-74	-62	24.6	12.2	4.7	3.4	3.4
Forestry and fishing	3.9	3.2	-.7	-18	-27	.3	.2	.2	.1	.1
Mining	3.1	4.5	1.4	45	-35	.2	1.6	.2	.8	.8
Construction	86.4	124.7	38.3	44	22	5.9	6.1	6.2	5.5	5.5
Manufacturing	409.0	670.9	261.9	64	29	27.9	26.0	33.6	24.4	24.4
Durable goods	107.8	209.7	101.9	95	43	7.4	13.8	10.5	14.4	14.4
Nondurable goods	301.1	461.2	160.1	53	12	20.6	12.3	23.1	10.0	10.0
Transport., commun., and other utilities	65.4	104.3	38.9	60	10	4.5	7.9	5.2	6.3	6.3
Wholesale trade	32.8	71.2	38.4	117	52	2.2	3.5	3.6	3.9	3.9
Retail trade	176.7	261.9	85.2	48	36	12.1	15.1	13.1	15.0	15.0
Fin., insur. & real estate	24.4	66.5	42.1	173	90	1.7	3.4	3.3	4.7	4.7
Services	240.6	417.1	176.5	73	87	16.4	17.9	20.9	24.5	24.5
Personal	106.7	99.5	-7.2	-7	-5	7.3	6.1	5.0	4.3	4.3
Prof. & Related	97.8	267.8	169.9	174	165	6.7	8.6	13.4	16.5	16.5
Other	36.1	49.9	13.8	38	58	2.5	3.2	2.5	3.7	3.7
Public administration	38.5	68.0	29.5	77	61	2.6	4.5	3.4	5.2	5.2
Industry not reported	22.5	112.3	89.8	399	464	1.5	1.5	5.6	6.2	6.2

<sup>a</sup>Sources: U.S. Bureau of the Census (1962, 1963, 1972 and 1973).

During these two decades, the rate of increase in employment in North Carolina was two to six times greater than the national rate in construction, manufacturing, transportation, communication and other utilities, and wholesale trade and almost twice the national rate in finance, insurance and real estate. However, the state continued to lag the nation in the rate of increase in employment in service industries, and the rate of decline in N.C. agricultural employment was about 20 percent greater than for the nation.

With the above changes, manufacturing and services in 1970 provided more than one-half of the state's employment with manufacturing accounting for over one-third of the total. When broadly defined to include transportation, communication and other utilities, trade, finance, insurance and real estate, services and public administration, employment in service industries amounted to about 60 percent of the total for the nation and about one-half for the state (Table 1). On the other hand, the proportion of agricultural employment in the state declined from one-fourth in 1950 to less than one-twentieth in 1970.

### Manufacturing Employment

Even with the severe national economic recession in late 1974 and 1975, manufacturing employment in North Carolina almost doubled from 1950 to 1977, increasing 370,000 or 91 percent as compared to the national increase of 41 percent (Table 2). With the exception of lumber and wood products, the rate of increase in employment in each N.C. manufacturing sector during this 27-year period was substantially higher than for the nation. Manufacturing also became much more diverse and the relative importance of textiles (even with a 44,000 increase in employment) and lumber and wood products declined sharply -- from 65 percent of total manufacturing employment in 1950 to 38 percent in 1977.

Employment in electrical and nonelectrical machinery and fabricated metals increased at exceedingly high rates and accounted for about one-fourth of the state's total increase in manufacturing employment from 1950 to 1977 (Table 2). Apparel experienced the largest absolute increase in employment of any manufacturing sector during this period, but its



Table 2. Change in manufacturing employment in North Carolina, 1950 to 1977<sup>a</sup>

Industry	N.C. manufacturing employment			Change in employment, 1950-77		
	1950	1960	1977	N.C.	Percent change	
					N.C.	U.S.
	(000)			(000)		
Total manufacturing	409.0	509.2	779.3	370.3	91	41
Durable goods	107.8	147.7	261.7	153.9	143	58
Lumber and wood prod.	52.2	36.8	33.4	-18.8	-36	-17
Furniture	30.7	43.9	76.1	45.4	148	55
Stone, clay & glass	6.1	9.6	17.1	11.0	180	43
Primary metals	3.0	3.1	6.7	3.7	123	9
Fabricated metals	2.5	7.0	23.6	21.1	844	67
Nonelectrical mach.	5.4	12.9	36.8	31.4	581	85
Electrical mach.	4.1	25.3	44.1	40.0	976	135
Transportation equip.	1.8	5.3	9.2	7.4	411	58
Scientific instruments	.4	1.1	10.3	9.9	2475	158
Other durables	1.7	2.6	4.4	2.7	159	68
Nondurable goods	301.1	361.5	517.6	216.5	72	21
Food and kindred	19.5	33.0	42.5	23.0	118	19
Tobacco	22.3	27.5	26.8	4.5	20	-25
Textiles	215.1	221.7	259.5	44.4	21	-26
Apparel	14.6	33.0	85.6	71.0	486	18
Paper and allied	7.9	13.5	21.1	13.2	167	49
Printing & publishing	8.6	13.1	17.8	9.2	107	54
Chemicals	8.9	13.5	37.2	28.3	318	78
Rubber & synthetics	1.0	2.1	22.6	21.6	2160	129
Other nondurables	3.2	4.1	4.5	1.3	41	-34

<sup>a</sup>Sources: U.S. Bureau of the Census (1962 and 1963); U.S. Dept. of Labor (January 1978), and unpublished data from U.S. Dept. of Labor, Bureau of Statistics, secured from Bureau of Employment Security Research, N.C. Employment Security Commission.

rate of growth slackened in the 1970's. Other manufacturing sectors -- including furniture, chemicals, food, and rubber and synthetics -- experienced an increase of over 20,000 in employment from 1950 to 1977.

### Occupational Employment

While changes in the state's industrial mix have been essential to the state's recent spurt of economic growth, this could not have occurred without a corresponding improvement in the skill mix of the state's labor force. In 1940 slightly more than two-fifths of the state's workers were farm workers or unskilled laborers (Table 3). By contrast 25 percent of the national labor force was employed in these occupations. Today only about 10 percent of the state's employees are farm workers or unskilled laborers. The proportion of employment in four major skill categories -- professional, managerial, clerical and craftsmen -- correspondingly expanded. The percentage of operatives and sales workers in the state's labor force has also increased slightly since 1940. The proportion of service workers remains basically unchanged. Nevertheless, the skill mix in North Carolina continues to lag behind that of the United States in that the state has significantly fewer professional workers and more operatives. Partially offsetting this is the state's smaller percentage of clerical and service workers.

The state's occupational structure shifted dramatically in the 1960's. In the 1940's and 1950's, 85 percent of the state's employment growth was clustered in three occupations: clerical, craftsmen and operatives. The occupational distribution of employment growth became more balanced in the 1960's and 1970's. Professional employment expanded by 66 percent in the state in the 1960's; managerial employment, by 67 percent in the 1970's (Table 4). Employment growth among clerical workers in the state has paralleled the national trend. The state's skilled and semiskilled blue-collar employment has grown more rapidly than in the nation. Since average years of schooling for the state's youth almost equals the corresponding national average, it seems quite likely that much of the future employment growth in North Carolina will be concentrated among professional and managerial workers.

Table 3. Distribution of employment, by occupation, United States and North Carolina, 1940-1978<sup>a</sup>

Occupation	U.S.				N.C.			
	1940	1960	1970	1978 (est.)	1940	1960	1970	1978 (est.)
	(percent)							
Total <sup>b</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Professional	8.0	11.4	14.1	15.5	5.0	7.8	10.4	10.5
Managers	8.0	10.8	10.6	10.9	5.3	6.7	7.2	9.6
Sales	6.9	6.4	6.1	6.3	4.4	6.4	5.8	5.5
Clerical	9.8	14.9	17.4	18.1	4.4	9.5	13.2	14.5
Craftsmen	11.5	13.1	13.0	12.8	7.3	11.6	13.6	14.8
Operatives	17.7	18.2	17.7	15.2	21.2	24.8	24.8	24.7
Laborers	6.9	5.5	4.7	4.6	7.3	5.0	4.8	5.6
Service	11.8	13.5	12.3	13.7	10.5	11.0	10.2	10.6
Farm workers	18.2	7.9	3.9	2.7	33.5	12.3	4.2	4.2

<sup>a</sup>Sources: U.S. Bureau of the Census (1962, 1963 and 1978b), U.S. Dept. of Labor, (March and May, 1978), and N.C. Employment Security Commission (1978).

<sup>b</sup>Note: Totals may not add up to 100.0 because of (1) omission of the "not reported" category for 1940-1970 and (2) rounding error.

Table 4. Percentage change in occupational employment, North Carolina and United States, 1940-1978<sup>a</sup>

Occupation	1940-1960		1960-1970		1970-1978 (est.)	
	N.C.	U.S.	N.C.	U.S.	N.C.	U.S.
	(percent)					
Total	33.4	45.9	24.5	19.4	25.2	16.8
Professional	110.0	108.3	65.9	48.0	26.3	27.9
Managers	68.8	97.2	33.3	16.9	67.4	20.5
Sales	94.3	35.5	11.6	14.3	19.1	20.8
Clerical	186.8	122.7	74.3	39.8	37.4	21.2
Craftsmen	112.5	65.4	45.4	18.6	36.4	15.7
Operatives	56.5	50.0	24.1	15.8	25.0	0.7
Laborers	-8.0	16.1	17.3	2.8	47.4	13.5
Service	39.7	67.9	15.9	9.0	29.9	29.9
Farm workers	-50.9	-36.6	-57.6	-40.4	21.4	-19.4

<sup>a</sup>Source: Same as Table 3.

## Wage Rates

Even with substantial diversification of manufacturing as discussed above and nearly a threefold increase in the average wage rate since 1950, manufacturing wages in North Carolina continue to be among the lowest of any state. The state average manufacturing wage was \$4.10 in 1977 compared to \$5.63 for the nation. Factors contributing to relatively low wages in North Carolina are discussed in Part II of this report.

The N.C./U.S. total manufacturing wage ratio declined from .76 in 1950 to .73 in 1977, with a decline of .08 from 1950 to 1960 and an increase of .05 from 1960 to 1977 (Table 5). Part of this difference may reflect changes in the sizes of firms covered by the statistical series over time. The state-national wage ratio increased by .1 or more from 1950 to 1977 in furniture, stone, clay and glass products, fabricated metals, food (1960-77), and apparel. The N.C./U.S. wage ratio declined in primary metals, transportation equipment, and printing and publishing; each of which has relatively high national wages and is highly unionized at the national level. Tobacco, paper and textiles are the only manufacturing industries in the state in which wages are approximately equal to those for the nation. The state-national wage ratio in 1977 ranged from .8 to .9 for furniture, fabricated metals, electrical machinery, apparel, chemicals, and rubber and synthetics (Table 5).

## Manufacturing Employment Changes by National Wage Groupings

Employment in the group of manufacturing industries with the highest national wage rates increased relatively more rapidly (+371 percent) and became relatively more important in North Carolina from 1950 to 1977 (Table 6). Employment in manufacturing industries with the lowest national wages increased less rapidly (+45 percent) and, therefore, became relatively less important. The state's share of manufacturing employment in the highest wage industries increased from

Table 5. Changes in hourly manufacturing wage rates, North Carolina and United States, 1950 to 1977<sup>a</sup>

Industry	N.C. wage rates			N.C./U.S. wage ratio			Change in N.C./U.S. wage ratio 1950-77
	1950	1960	1977	1950	1960	1977	
	(dollars)						
Total manufacturing	1.10	1.54	4.10	.76	.68	.73	-.03
Durable goods	.98	1.51	4.19	.64	.62	.70	.06
Lumber & wood prod.	.89	1.27	3.58	.68	.67	.71	.03
Furniture	1.00	1.43	3.84	.78	.76	.89	.11
Stone, clay & glass	.95	1.44	4.45	.66	.63	.79	.13
Primary metals	1.31	2.06	4.79	.79	.73	.64	-.15
Fabricated metals	1.13	1.76	4.87	.74	.72	.84	.10
Nonelectrical mach.	1.16	1.63	4.62	.72	.64	.75	.03
Electrical mach.	b	1.92	4.50	b	.84	.84	.00c
Transportation equip.	b	2.09	4.48	b	.76	.62	-.14c
Nondurable goods	1.14	1.55	4.06	.84	.76	.80	-.04
Food and kindred	b	1.30	3.87	b	.62	.72	.10c
Tobacco	1.12	1.82	5.78	1.04	1.07	1.05	.01
Textiles	1.16	1.51	3.89	.94	.94	.98	.04
Apparel	.92	1.20	3.13	.74	.75	.86	.12
Paper and allied prod.	1.44	2.25	5.90	1.03	1.00	1.00	-.03
Printing & publishing	b	2.22	4.62	b	.83	.76	-.07c
Chemicals	b	1.92	5.15	b	.77	.81	.04c
Rubber & synthetics	b	b	4.61	b	b	.90	b

<sup>a</sup>Sources: U.S. Dept. of Labor (1970, 1973 and March 1978) and unpublished data from U.S. Dept. of Labor, Bureau of Statistics, secured from Bureau of Employment Security Research, N.C. Employment Security Commission.

<sup>b</sup>Data not available.

<sup>c</sup>For period 1960 to 1977.

Table 6. Changes in manufacturing employment by United States industrial wage groupings, North Carolina and United States, 1950 to 1977<sup>a</sup>

Industrial groupings	N.C. manufacturing employment			Percent of total			Change 1950-77		
	(000)			1950 1977 1950 1977			Percent No. of employees		
	1950	1977	1950	1977	1950	1977	N.C.	U.S.	U.S.
Total manufacturing	409.0	779.3	100	100			91	41	370.3
Highest U.S. wage industries <sup>b</sup>	19.1	89.9	4.7	11.5			371	55	70.8
Primary metals	3.0	6.7	.7	.9			123	9	3.7
Transportation equipment	1.8	9.2	.4	1.2			411	58	7.4
Chemicals & allied	8.9	37.2	2.2	4.8			318	78	28.3
Nonelectrical machinery	5.4	36.8	1.3	4.7			581	85	31.4
Moderate U.S. wage industries <sup>c</sup>	72.0	215.6	17.6	27.7			199	61	143.6
Printing & publishing	8.6	17.8	2.1	2.3			107	54	9.2
Paper & allied	7.9	21.1	1.9	2.7			167	49	13.2
Fabricated metals	2.5	23.6	.6	3.0			844	67	21.1
Stone, clay & glass	6.1	17.1	1.5	2.2			180	43	11.0
Tobacco	22.3	26.8	5.5	3.4			20	-25	4.5
Food	19.5	42.5	4.8	5.5			118	19	23.0
Electrical machinery	4.1	44.1	1.0	5.7			976	135	40.0
Rubber and synthetics	1.0	22.6	.2	2.9			2160	129	21.6
Lower U.S. wage industries <sup>d</sup>	312.6	454.6	76.4	58.3			45	-3	142.0
Lumber & wood products	52.2	33.4	12.8	4.3			-36	-17	-18.8
Furniture & fixtures	30.7	76.1	7.5	9.8			148	55	45.4
Textiles	215.1	259.5	52.6	33.3			21	-26	44.4
Apparel	14.6	85.6	3.6	11.0			486	18	71.0
Miscellaneous industries <sup>e</sup>	5.3	19.2	1.3	2.5			262	24	13.9
									330.9

<sup>a</sup>Sources: U.S. Bureau of the Census (1962 and 1963); U.S. Dept. of Labor (January 1978), and U.S. Dept. of Labor, Bureau of Statistics unpublished data secured from Bureau of Employment Security Research, N.C. Employment Security Commission.

<sup>b</sup>U.S. wages in 1977 more than 10 percent above national average of \$5.63.

<sup>c</sup>U.S. wages in 1977 varying less than 10 percent from national average of \$5.63.

<sup>d</sup>U.S. wages in 1977 more than 10 percent below national average of \$5.63.

<sup>e</sup>Includes scientific instruments, petroleum and coal products, leather, miscellaneous industries and industries not specified.

5 percent in 1950 to 12 percent in 1977 while the share in the lowest wage industries declined from 76 to 58 percent (Table 6). The state share of total manufacturing employment in textiles alone declined from 53 percent to 33 percent from 1950 to 1977. Yet, even with these dramatic changes, employment growth in the three lowest wage manufacturing industries -- furniture, textiles and apparel -- during this 27-year period made up 43 percent of the total increase in manufacturing employment. Their combined employment continued to make up over one-half (54 percent) of the state's total manufacturing employment in 1977.

### Personal Income

While the focus of this report is on employment and wages, the overall economic well-being of the state's residents also depends on government tax and transfer policies and asset income. Personal income is defined as "the current income received by persons from all sources net of contributions for social insurance." It includes wage and salary income, other labor income (mostly employer payments to private pension, health and welfare plans), proprietors' income (farm and non-farm), transfer payments, dividends, interest, rent, and adjustments for the value of owner-occupied housing and of food produced and consumed on farms.

Although per capita income in North Carolina remains below the national average, the rate of growth has been larger than that of the nation since 1950 (Table 7). In 1950 per capita income in North Carolina was 69 percent of the national average; in 1977, 84 percent. Much of that narrowing occurred in the 1960's when the state's per capita income more than doubled, while the national average increased by 78 percent. Since 1970 the state's per capita income has grown at only a slightly faster rate than the national average.

The growth of per capita income in North Carolina closely parallels that of the entire southeastern region. Since 1960 the state's per capita income has grown 273 percent while the (unweighted) average per capita income of 10 southeastern states has grown 272 percent.



Table 7. Personal and per capita income, United States and North Carolina, 1950-1977<sup>a</sup>

Income	1950	1960	1970	1977
Personal income, U.S. (in billions of dollars)	227.6	401.0	808.3	1518.4
Personal income, N.C. (in billions of dollars)	4.2	7.1	16.4	32.8
Per capita income, U.S. (dollars)	1496	2216	3943	7019
Per capita income, N.C. (dollars)	1037	1558	3218	5935
N.C. per capita income as a percent of U.S.	69	72	82	84

<sup>a</sup>Source: U.S. Bureau of the Census (1975) and U.S. Dept. of Commerce (October 1978).

When one takes the lower cost of living in North Carolina into account, the gap in incomes between this state and the national average is reduced considerably. Recent estimates indicate that the price level in the state in 1972 was 13 percent less than the national price level (Fuchs, Michael and Scott, 1978). If this price level difference prevails today, this implies that the state's real per capita income is only 3 percent below that of the United States.

## Part II

### FACTORS INFLUENCING NORTH CAROLINA'S RELATIVE WAGE LEVELS

In considering relative wage or income levels, one must recognize first that earnings are influenced by many factors -- not all of which are current or contemporaneous. Indeed, without an historical perspective, one cannot understand existing wage patterns and levels. As (the late) James G. Maddox (1967) pointed out, southern and N.C. wage levels reflect past patterns of low school attainment and quality as well as past patterns of racial discrimination.

#### Schooling and Skill Development

As suggested by Maddox's work, skill levels imparted by schooling and other investments in human capital are the most important determinants of wage levels and, therefore, of N.C.'s relative wage position in the nation. As of 1970, median school attainment of N.C. adults 25 years and older lagged the national level for adults by 1.3 years, 10.8 versus 12.1 years (Table 8). Moreover, as of 1970, 37 percent of N.C.'s adult population had eight or fewer years of schooling as compared to 28 percent for the nation. Such sizable differences substantially influence relative earnings levels and the relative occupational mix. Research by Hyman and Fearn (1978) indicates that the 1.3-year difference in schooling levels could account for a real labor income difference of 12 percent. The national analysis shows

Table 8. Median years of schooling, 1970, all persons by age and sex, North Carolina and United States<sup>a</sup>

Age groups	N.C.		U.S.	
<u>All persons</u>	<u>All persons</u>		<u>All persons</u>	
14 and above	10.9		12.0	
14-19	9.9		10.1	
20-24	12.5		12.7	
-----				
25 and above	10.8		12.1	
	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
14 and above	10.6	11.1	11.9	12.0
14-19	9.8	10.0	10.0	10.2
20-24	12.5	12.5	12.7	12.6
-----				
25 and above	10.4	11.0	12.1	12.1
25-29	12.3	12.4	12.6	12.5
30-34	12.2	12.3	12.5	12.4
35-39	12.0	12.1	12.4	12.3
40-44	11.0	11.5	12.2	12.3
45-49	10.4	11.2	12.2	12.2
50-54	9.4	10.5	12.0	12.1
55-59	8.5	9.3	10.7	11.1
60-64	8.0	8.7	9.6	10.4
65-69	7.3	8.1	8.8	9.1
70-74	7.1	7.9	8.6	8.8
75 & over	6.8	7.6	8.3	8.6

<sup>a</sup>Source: U.S. Bureau of the Census (1972 and 1973).

that persons with 9-11 years of schooling can be expected to receive about 12 percent less than those who have completed 12 years; holding cost-of-living and other wage determining factors constant.

A more detailed look at school attainment by age, sex and color provides a longer range view (Tables 8, 9 and 10). Those tables indicate that the observed schooling difference among adults is largely a vintage phenomenon, although one with racial overtones. Younger North Carolinians were much closer to the national schooling norm in 1970 than the older members of the population. For N.C. whites 30 years of age and below virtual parity with the national level of schooling had been achieved in 1970 (Table 9). Among blacks, the parity age was lower; about 20-24 years of age -- and blacks lagged whites nationally even in the younger age groups (Tables 9 and 10). Despite the schooling improvements among the younger age cohorts, median or average earnings comparisons still reflect the impact of the older, much less educated persons.

Recent research shows a vintage (or cohort) effect in the quality as well as the quantity of schooling being afforded younger persons throughout the South (Smith and Welch, October 1977). Their national study, however, did not single out North Carolina. Without a more detailed examination of North Carolina quality of schooling data, one cannot indicate the extent to which North Carolinians have benefited from schooling quality changes. Analysis of changes in schooling quality and attainment among black and rural youth would be of particular interest.

As mentioned above, other dimensions of skill in North Carolina relative to the nation have been changing in a positive direction. Rapid growth of skilled craftsmen is particularly noteworthy. Because these data are obtained from "household" statistics rather than private firm "establishment reports," there is some question concerning the definition(s) of skill used by household respondents. Even with some possible overstatement in the data, however, the growth of skilled craftsmen in North Carolina is impressive. As in the case of school attainment, "skill quality" questions remain open, and North Carolina may not have increased in skill quality as much as it appears from the

Table 9. Median years of schooling, 1970, whites by age and sex, North Carolina and United States<sup>a</sup>

Age groups	N.C.		U.S.	
14 and above	11.3		12.1	
14-19	10.0		10.1	
20-24	12.6		12.7	
-----				
25 and above	11.2		12.1	
	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
14 and above	11.1	11.4	12.0	12.0
14-19	9.9	10.1	10.0	10.2
20-24	12.6	12.6	12.8	12.7
-----				
25 and above	11.0	11.4	12.1	12.1
25-29	12.4	12.4	12.7	12.6
30-34	12.3	12.3	12.6	12.5
35-39	12.2	12.2	12.5	12.4
40-44	11.4	11.8	12.3	12.3
45-49	11.0	11.4	12.3	12.3
50-54	10.1	11.1	12.1	12.1
55-59	9.0	10.1	11.0	11.6
60-64	8.5	9.3	10.0	10.7
65-69	7.8	8.6	8.9	9.5
70-74	7.6	8.3	8.7	8.9
75 and above	7.3	8.0	8.4	8.7

<sup>a</sup>Sources: Same as Table 8.

Table 10. Median years of schooling, 1970, Negroes by age and sex, North Carolina and United States<sup>a</sup>

Age groups	N.C.		U.S.	
14 and above	9.4		10.1	
14-19	9.6		9.7	
20-24	12.2		12.3	
25 and above	8.5		9.8	
	<u>Males</u>	<u>Females</u>	<u>Males</u>	<u>Females</u>
14 and above	9.0	9.7	9.9	10.4
14-19	9.5	9.7	9.5	9.8
20-24	12.1	12.3	12.2	12.3
25 and above	7.9	9.0	9.4	10.1
25-29	11.8	12.0	12.1	12.2
30-34	10.5	11.3	11.7	11.9
35-39	9.5	10.7	11.0	11.4
40-44	8.6	10.1	10.1	10.8
45-49	7.8	9.0	9.3	10.0
50-54	7.0	8.1	8.5	9.0
55-59	6.3	7.6	7.6	8.4
60-64	5.8	7.2	6.9	7.9
65-69	4.8	6.4	6.0	7.0
70-74	4.5	6.0	5.6	6.7
75 and above	4.3	5.5	5.1	6.1

<sup>a</sup>Sources: Same as Table 8.

crude data. What is clear is that if the state continues to match (or exceed) the national educational attainment level for each cohort coming of adult age and also improves its skill mix relative to the nation, the observed earnings differential between the state and nation can be expected to continue to decline. Quality differences, however, require much more detailed research by social scientists.

### Cost of Living

Comparisons of wages, earnings, or income in real terms (monetary data adjusted for differences in the cost of living) are more meaningful. As noted above, adjusting for cost of living differences raises N.C. incomes substantially relative to the national average. That phenomenon is not unique to North Carolina but is a characteristic of the entire South (excluding Florida). A study of the North-South wage differential by Don Bellante (1979) demonstrated that most of the North-South differential disappears when money wage levels are adjusted for differences in cost of living and skill levels. Thus, current real wage levels in the South are quite close to real wage levels in the North and West -- for persons of equal skill. Given the limited nature of available cost of living indexes plus some interpretation problems when the available indexes are used for individual states, it is difficult to ascertain what the "true" index should be for adjusting N.C. wages. The direction of that adjustment and crude orders of magnitude are known; precise estimates are not.

### Unionization

Unionization generally has a positive impact on wage levels. Strong unions have succeeded in certain industries and at various times in raising relative wages by about 25 percent, while a number of large and seemingly powerful unions have been unsuccessful in raising relative wages; i.e., wages above the levels which would have prevailed without unionization. This is particularly true for unions in industries or firms facing severe competition from nonunion employers at home



or from foreign producers. H. Gregg Lewis, a widely recognized American labor economist, is currently updating his work (Lewis, 1963) to include 26 or so recent studies of union wage effects which show the median effect of unions on wages to be about 11 percent. Thus, if unionization in North Carolina rose by 20 percentage points -- from the present level of about 7 percent to the approximate national level of 27 percent -- average wages in North Carolina would be expected to increase by about 2 percent ( $.20 \times .11$ ). That measure represents a one-time change and its magnitude depends on the unions in North Carolina having the same relative impact as unions across the nation.

These comments are not intended to denigrate unions or union actions in providing employee representation, bargaining, grievance arrangements, and the like. Rather, they are intended as an assessment of the potential contribution of unions to the wage and earnings levels of North Carolinians relative to those for the nation.

### Tenure

Recent research on national wage levels indicates that tenure and other measures of job experience are important determinants of wage levels (Mincer and Polachek, 1974; Polachek, 1975; Smith and Welch, January 1978; and Hyman and Fearn, 1978). These measures reflect, in part, the productive learning processes generally called on-the-job training (O-J-T), but they may reflect seniority systems unrelated to productivity or other factors. Without regard to why wages rise with tenure and experience, it seems that, relative to the rest of the nation, the potential impact of O-J-T and tenure has not yet been realized throughout the newer and higher paying industries in North Carolina.

### City Size

Holding cost of living and other wage determining factors constant and using a different data base, recent studies by Hyman and Fearn (1978)

and Quinn and McCormick<sup>1</sup> indicate that city size has a positive effect on wage levels. All other factors equal, labor incomes would be expected to be 6 percent higher in cities of 5 million persons than in cities of 500,000. Presumably, these wage differences reflect differences in commuting and other costs and otherwise equalize for the net nonpecuniary disadvantages of big-city living (more congestion, pollution, crime, etc.).

### Other Factors

Wage levels also reflect other characteristics -- the dangers inherent in a particular occupation (to the degree that these dangers are known by workers), disability, poor health, search costs, and the like. There is a large literature which demonstrates the influence of these factors. The effect of such characteristics on the N.C./U.S. wage difference depends upon the distribution of dangerous and unhealthy conditions and on search costs in North Carolina compared to the nation.

### Summary

One would expect wages to be lower in North Carolina than in the rest of the nation because of lower educational levels, cost of living differences, less unionization and urbanization, and lags in observing returns to O-J-T in industries which have recently located in the state. It is natural to ask how much of the difference in wages between the United States and North Carolina can be accounted for by each of these factors. The first necessary step is an adjustment for differences in the cost of living. If the Fuchs, Michael and Scott (1978) estimate of a 13 percent lower cost of living in North Carolina in 1972 still applies, the comparable average wage in the state in 1977 would have been \$4.71 instead of \$4.10, a difference of 61 cents (Table 11). With respect to wage differences resulting from different educational levels, recall that Hyman and Fearn found high school graduates earned 12 percent

---

<sup>1</sup>Unpublished paper by Joseph Quinn and Karen McCormick, "Wage Rates and City Size," Boston College, 1978.

Table 11. Factors explaining differences in United States and North Carolina wages :

	(dollars)
Average U.S. manufacturing wage, 1977	5.63
Average N.C. manufacturing wage, 1977	4.10
Difference in U.S. and N.C. wages, 1977	1.53
Estimated amount of difference explained by differences in:	
(1) Education	.64
(2) Cost of living	.61
(3) Unionization	.10
Explained difference	1.35
Unexplained difference	.18

more than those who went to high school but did not graduate. Since median years of schooling in North Carolina in 1970 were 10.8 while the national average was 12.1, it seems reasonable to assume that closing the N.C./U.S. educational gap would raise average N.C. wages by the same proportion. This would increase the average wage in the state from \$4.71 to \$5.35, a difference of 64 cents. We noted above that unionization may account for an additional 2 percent of the difference; i.e., about 10 cents (Table 11). These three factors were estimated to account for \$1.35 of the \$1.53 difference in wages between North Carolina and the United States, leaving only 12 percent of the difference unexplained. Part of this residual may be explained by differences in urbanization, quality of education, and lagged O-J-T returns, but these topics have not been sufficiently well researched to attach a numerical estimate to their importance in this instance. The reader should also be aware that the results of this accounting scheme will change somewhat if one uses other estimates of interstate differences in the cost of living and the effect of educational or unionization on earnings. The results may also be altered if one uses a complex econometric model. We feel, however, that the qualitative flavor of this accounting would not be substantially changed.

### Part III

#### FURTHER CONSIDERATIONS ASSOCIATED WITH ECONOMIC GROWTH

Recent wage and employment patterns suggest considerable economic growth in North Carolina. Implications of these developments which may be of concern to citizens in the state are discussed in this section -- including migration, industrial diversification, cyclical sensitivity, effects on those with low levels of education and occupational skills, and environmental effects.

#### Migration

Further evidence demonstrating the improved economic welfare of N.C. residents is found in the pattern of interstate migration flows over the last 40 years. Economic theory and numerous empirical research studies indicate that individuals at all occupational levels tend to migrate to locations where their net advantage (economic and social) is maximized -- provided that: (1) they have information about available opportunities, (2) they are not physically prevented from moving, and (3) they can finance the move. Thus, one would expect to observe shifts in migration patterns over time -- perhaps with a lag -- whenever there are sizable shifts in the net advantage of living in different areas.

Such a shift has been taking place in North Carolina. In the 1940's and 1950's hundreds of thousands of workers left the state for the North and West in search of better paying jobs, improved educational opportunities for their children, and other reasons (Table 12). In the

Table 12. Net total migration for North Carolina,  
1940-1977<sup>a</sup>

Period	Total	White (000)	Negro
1940-1950	-258	-95	-164
1950-1960	-328	-121	-204
1960-1970	-94	81	-175
1970-1977	142	b	b

<sup>a</sup>Sources: U.S. Bureau of the Census (1975 and 1978a).

<sup>b</sup>Breakdown by race not available for 1977.

1960's in-migration exceeded out-migration among whites, but the state still had net out-migration because of the large number of blacks leaving North Carolina. Since 1970, however, the number of in-migrants has exceeded the number of out-migrants. While no breakdowns of this pattern by race are currently available for North Carolina, a recent study concluded that "the South does, in fact, have a small net in-migration of blacks," (U.S. Bureau of the Census, 1978a). Since N.C. migration patterns mirror those of the region fairly closely, it seems likely that more blacks are now moving to North Carolina than are moving away.

This shift in migration patterns has two important implications. First, it will make the labor market for skilled workers much more competitive for native North Carolinians, particularly those residing in areas where the amount and quality of both formal and vocational education lag than found elsewhere. Second, if economic growth in North Carolina continues to proceed more rapidly than elsewhere, one can expect net in-migration to continue and perhaps even accelerate. State and local governing units will need to take these factors into account when making decisions regarding the provision of education, health care, transportation, recreation, police and fire protection, and other public services.

#### Diversity and Magnitude of Choice for North Carolinians

The growth patterns described above contain benefits which are less apparent, but no less important, than increases in wages or income. Diversification of the employment mix quite obviously creates a wider universe of employment and occupational choice, particularly for young North Carolinians. That universe contrasts sharply with the set of choices that were available to young men and women in the 1940's or even the 1950's.

Recognition of this benefit may also involve a commitment to maintaining and expanding opportunities for choice and occupational mobility. Such a commitment has implications for the type of schooling, training and manpower development programs which will benefit the

trainees or students and society in general. Training which is too narrow will reduce the personal universe of choice; rigorous training which is sufficiently broad will assist future employees and managers to more easily and quickly adjust to North Carolina's changing employment scene.

### Cyclical Sensitivity

An additional factor which must be taken into consideration in examining North Carolina's recent economic progress is the cyclical sensitivity of employment. Improvements in wages and employment could be partially offset if the change in industrial mix results in a higher percentage of the state's workers losing their jobs during recessions.

Historically, the greatest increases in unemployment during recessions have been among workers in manufacturing and construction. Employees in agriculture, wholesale and retail trade, finance, services and public administration have a much smaller probability of losing their jobs. Given the tremendous decline in agricultural employment and the rapid growth of jobs in the manufacturing sector, it seems likely that the cyclical sensitivity of employment in North Carolina has increased substantially.

Within manufacturing the cyclical sensitivity of employment has also increased. The change in the layoff rate during the national recessionary period 1973 to 1975 is a more reliable measure of cyclical sensitivity than the average layoff rate because many industries have high layoff rates, regardless of aggregate conditions, due to such factors as seasonal demand or model changeovers. The 20 Standard Industrial Classifications (SIC) two-digit manufacturing industries can be placed into two groups: (1) those where 1973-75 layoff rates increased by more than average (*i.e.*, 1.2 percentage points or more) and (2) those where layoff rates increased by the average or less (*i.e.*, 1.1 points or less). Industries in the cyclically sensitive group include primary metals, rubber, fabricated metals, furniture, transportation equipment, miscellaneous manufacturing, electrical equipment, stone, clay, and glass products, paper, and apparel. Industries with



layoff rates which increased by 1.1 points or less in the 1973-75 period include nonelectrical machinery, lumber, leather, textiles, tobacco, food, scientific instruments, chemicals, printing, and petroleum. Between 1950 and 1977 the cyclically sensitive groups's share of state manufacturing employment increased from 18 to 40 percent. This reflects growth in the shares of furniture, apparel, rubber, fabricated metal products and electrical equipment.

Thus, North Carolina is more likely to be confronted in the future with more serious problems of unemployment, income maintenance and tax variability than has been the case in the past. Given the emerging consensus among economists and businessmen that a downturn in national output is presently taking place, it would seem quite reasonable for the state to evaluate alternative means of dealing with these problems more effectively.

### Those Left Behind

As noted above, much of the improvement in skill, income, earnings, and the like can be expected to be related to age cohorts and, we surmise, to race, sex, and even rurality. Alternatively stated, the wider universe of employment choices is of particular benefit to those who are equipped to take advantage of it. Others may be "left out" of the growing prosperity. Recall that in 1970, 37 percent of adult North Carolinians had eight or fewer years of schooling in contrast to the national level of 28 percent. Moreover, the ratio of poorly trained persons as a percent of the total population in North Carolina compared to the same ratio nationally has been growing and likely will continue to grow (Table 13). The expected continued relative growth of this ratio reflects the vintage phenomenon noted above, but it also serves as a reminder that there will be sizable numbers of persons with limited skills and limited flexibility seeking suitable employment for some time into the future. Public policies which reduce employment opportunities for these elderly, poor and ill-equipped persons will work to their detriment and to the detriment of the entire body politic. The result will tend to be increasing welfare rolls, social alienation and exacerbation of related social, psychological and economic problems.

Table 13. Percent of adult population with 8 or fewer years of schooling, United States and North Carolina, 1940-1977<sup>a</sup>

Year	U.S.	N.C.	N.C./U.S. ratio
1940	60.6	66.0	1.09
1950	46.9	59.8	1.28
1960	39.8	50.8	1.28
1970	28.3	37.1	1.31
1977	18.4	b	b

<sup>a</sup>Sources: U.S. Bureau of the Census (1942, 1952, 1962, 1972, 1975 and 1978<sup>b</sup>).

<sup>b</sup>1977 data for North Carolina are not available.

### Environmental Effects

As most persons now recognize, economic growth and industrial development may contain "negative externalities" or spillover effects -- significant costs borne by persons who do not participate equally in the benefits from the decisions leading to economic growth. Some of these costs will be borne by the entire population. Many of these externalities are ecological or environmental in nature, and many are associated with urbanization.

In the final analysis, the political process will determine the extent of the acceptable tradeoff between growth and environmental quality and will formulate policies and procedures to institutionalize those tradeoffs. However, the economic system is very complex and attempts to establish acceptable tradeoffs may be very costly or self-defeating.

## REFERENCES

- Bellante, Don. 1979. The north-south differential and the migration of heterogeneous labor. *American Economic Review*, Vol. 69, No. 1, pp. 166-75.
- Fuchs, Victor R., Robert T. Michael, and Sharon R. Scott. October 1978. A state price index. National Bureau of Economic Research Working Paper No. 320, Cambridge, Massachusetts.
- Hyman, David N., and Robert M. Fearn. 1978. The influence of city size on labor incomes. *The Quarterly Review of Economics and Business*, Vol. 18, No. 1, pp. 63-73.
- Lewis, H. Gregg. 1963. *Unionism and Relative Wages in the United States*, University of Chicago Press, Chicago.
- Maddox, James G. 1967. *The Advancing South: Manpower Problems and Prospects*, Twentieth Century Fund, New York.
- Mincer, Jacob, and Solomon Polachek. 1974. Family investments in human capital: Earnings of women. *Journal of Political Economy*, Vol. 82, No. 2, Part II, pp. S76-S108.
- North Carolina Employment Security Commission. 1978. *Labor Supply and Demand for North Carolina for 1978*, Bureau of Employment Security Research, Raleigh.
- Polachek, Solomon. 1975. Differences in expected post-school investment as determinants of market wage differentials. *International Economic Review*, Vol. 16, No. 2, pp. 451-80.
- Smith, James P., and Finis R. Welch. October 1977. *Inequality: Race Differences in the Distribution of Earnings*. Rand Corporation Paper P-5481-1. Rand Corporation, Santa Monica, California.

- \_\_\_\_\_. January 1978. Race Differences in Earnings: A Survey and New Evidence. Rand Corporation Report R-2295-NSF. National Science Foundation, Washington, D.C.
- U.S. Bureau of the Census. 1942. U.S. Census of Population, 1940. Vol. II, Part 5. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1952. U.S. Census of Population, 1950, Vol. II, Part 33. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1962. U.S. Census of Population, 1960, PC(1)-35D. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1963. U.S. Census of Population, 1960, PC(1)-1D. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1972. U.S. Census of Population, 1970, PC(1)-D35. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1973. U.S. Census of Population, 1970, PC(1)-D1. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1975. Historical Statistics of the United States: Colonial Times to 1970, Bicentennial Edition, Part 1. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1978a. Geographical mobility: March 1975 to March 1978. Current Population Reports, Series P-20, No. 331. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1978b. Statistical Abstract of the United States, 1978, 99th edition. U.S. Government Printing Office, Washington, D.C.
- U.S. Dept. of Commerce. October 1978. State Personal income, 1975-77. Survey of Current Business, Vol. 58, No. 10, pp. 31-41. Bureau of Economic Analysis. U.S. Government Printing Office, Washington, D.C.
- U.S. Dept. of Labor. 1970. Employment and Earnings: States and Areas, 1939-69, Bureau of Statistics, Bull. 1370-7. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. 1973. Employment and Earnings: United States 1909-72, Bureau of Statistics, Bull. 1312-9. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. January 1978. Employment and Earnings, Vol. 25, No. 1, Bureau of Statistics. U.S. Government Printing Office, Washington, D.C.
- \_\_\_\_\_. March 1978. Employment and Earnings, Vol. 25, No. 3, Bureau of Statistics. U.S. Government Printing Office, Washington, D.C.

\_\_\_\_\_. May 1978. Employment and Earnings, Vol. 25, No. 5,  
Bureau of Statistics. U.S. Government Printing Office, Washington,  
D.C.

# **North Carolina Agricultural Research Service**

North Carolina State University  
at Raleigh

*D. F. Bateman*, Director of Research