

CHANGES IN MANUFACTURING EMPLOYMENT IN NORTH CAROLINA COUNTIES, 1980-85

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A turbulent economic environment challenged manufacturers from 1980 through 1985. During this period, the foreign exchange value of the dollar rapidly appreciated, oil prices surged and then plunged, inflation declined from double digit rates, and the U.S. economy went through two recessions. Moreover, manufacturing employment declined by more than a million workers.

Steven A. Waldhorn, Director of the Center for Economic Competitiveness at SRI International, has argued that rural areas lost a larger proportion of manufacturing employment than urban areas between 1980 and 1985 for the following reasons:

. . . Rural areas tend to be at a competitive disadvantage because of their industry mix and structure. They also tend to be dependent on just a few industries; these industries also happen to be the ones most affected by increasing foreign competition. Lower-cost foreign locations are attracting some basic U.S. manufacturing operations . . . at the expense of rural economies.¹

This study focuses on manufacturing employment in the Fifth District state of North Carolina because: 1) at 31 percent of total employment in the state, manufacturing in North Carolina accounts for a proportion of jobs that is higher than that of any other state in the nation, and 2) rural areas in North Carolina lost a larger percentage of manufacturing jobs than urban areas between 1980 and 1985. As will be shown for North Carolina, however, and contrary to Waldhorn's statement, rural areas were generally not at a competitive disadvantage to urban areas because of their mix of industries.

To evaluate if Waldhorn's thesis applied to North Carolina, this paper investigates whether this state's rural areas were relatively more dependent on manufacturing industries whose employment declined

nationwide between 1980 and 1985. The paper also analyzes changes in rural and urban jobs in three North Carolina industries—textiles, apparel, and chemicals—that lost the most jobs from 1980 to 1985, to determine if rural locations were disproportionately affected in these three industries. Finally, the article examines whether industry-specific changes in the foreign exchange value of the dollar affected manufacturing employment in North Carolina counties from 1980 to 1985.²

RURAL VERSUS URBAN COUNTIES

There are many different ways to define urban and rural areas. Most often, researchers use counties as the basic geographical unit. They define urban counties as those that are in metropolitan areas—all others are rural. Because there is much diversity within the urban and rural categories, some researchers use more than two categories to define the rural-urban character of counties.

This article uses a 10-class system to measure the degree of urbanization in counties. Under this system, counties are classified by population density and proximity to metropolitan areas into categories called "Beale codes."³ As shown in Table I, the higher the integer value of the Beale code, the more rural the county. Following a precedent set by a U.S. General Accounting Office study, this article defines rural areas as counties classified as Beale codes 6, 7, 8, and 9.⁴

² This article uses ES-202 data from the U.S. Department of Labor in which employment is disclosed for all counties at the 2-digit standard industrial classification level. The authors thank the North Carolina State Employment Commission for permitting access to this unpublished data set in which employment is listed for all data categories.

³ Economic Research Service of the U.S. Department of Agriculture.

⁴ U.S. General Accounting Office, *Rural Development: Federal Programs That Focus on Rural America and Its Economic Development* (Washington, D.C.: General Accounting Office), January 1989.

* The authors wish to thank Dan M. Bechter and William E. Cullison for helpful comments.

¹ "New Perspectives on Rural Development," *Hearing To Identify Prospects for Economic Development in Rural America*, before the Subcommittee on Rural Economy and Family Farming of the Committee on Small Business, United States Senate (Washington, D.C.: U.S. Government Printing Office, 1988), pp. 58, 62-63.

Table I

**RURAL-URBAN CONTINUUM (BEALE CODE) COUNTY CLASSIFICATION SYSTEM AND THE
DISTRIBUTION OF COUNTIES AND EMPLOYMENT IN THE NATION AND NORTH CAROLINA IN 1985**

Beale Code, Population and County Metropolitan Area (MA)	Percent of Counties		Percent of Mfg Employment	
	U.S.	NC	U.S.	NC
0 Central to MAs of over 1,000,000	2.0	0.0	30.0	0.0
1 Fringe of MAs of over 1,000,000	6.3	0.0	15.7	0.0
2 In MAs of 250,000 to 1,000,000	10.4	17.0	24.1	42.5
3 In MAs of less than 250,000	7.1	8.0	8.7	15.2
4 Urban 20,000 or more, adjacent to MA	5.1	5.0	5.1	8.7
5 Urban 20,000 or more, not adjacent to MA	5.1	7.0	2.9	5.9
*6 Urban less than 20,000, adjacent to MA	18.7	19.0	5.9	14.5
*7 Urban less than 20,000, not adjacent to MA	25.4	17.0	6.0	10.0
*8 Completely rural, adjacent to a MA	6.5	5.0	0.6	5.1
*9 Completely rural, not adjacent to a MA	13.5	22.0	1.0	2.8
TOTAL URBAN (0 + 1 + 2 + 3 + 4 + 5)	36.0	37.0	86.5	72.3
TOTAL RURAL (6 + 7 + 8 + 9)	64.1	63.0	13.5	27.8

Notes: Metropolitan status was determined by the U.S. Office of Management and Budget, June 1983, based on the results of the 1980 census. Metropolitan areas must have either 1) a city of at least 50,000 population, or 2) an urbanized area of at least 50,000 with a total metropolitan population of at least 100,000. This criterion further defines Beale codes 3, 4, and 5. A completely rural (Beale codes 8 and 9) county has no town in it with over 5,000 population. A county adjacent to a metropolitan area must have an adjacent physical boundary and at least 2 percent of its employed labor force must commute to metropolitan central counties.

* Counties in these four classes are considered rural by the U.S. General Accounting Office in their study *Rural Development: Federal Programs That Focus on Rural America and Its Economic Development*, January 1989.

Sources: Beale codes were obtained from the Economic Research Service, U.S. Department of Agriculture; employment data were obtained from the Bureau of Labor Statistics, U.S. Department of Labor, ES-202 data.

The distribution of counties within rural and urban areas in North Carolina differs considerably from that of the national average, so changes in manufacturing employment in North Carolina are not necessarily representative of national trends (see "percent of counties," Table I). For example, North Carolina has no counties in the largest metropolitan areas (Beale codes 0 or 1), but 17 percent of its counties are in metropolitan areas with populations of 250,000 to 1,000,000 (Beale code 2). The figure shows the location of these counties in North Carolina.

The distribution of manufacturing jobs by Beale code in North Carolina is also different from that of the nation (see "percent of mfg employment," Table I). Only 72 percent of the manufacturing workers in North Carolina work in urban counties, compared with 87 percent in the nation. The greatest difference is in Beale code 2 counties, which contain over 40 percent of North Carolina's manufacturing jobs but only 24 percent of the nation's.

INFLUENCE OF INDUSTRY MIX ON EMPLOYMENT DECLINES

It has been argued that rural counties were more susceptible to downturns in the economy because a higher proportion of their jobs were in industries that reduced employment nationwide between 1980 and 1985.⁵ This section examines whether the nationally contracting industries actually were more predominant in rural than in urban areas of North Carolina and whether these industries experienced relatively larger employment losses in the state's rural areas. This section also examines the concentration of employment in contracting industries in North Carolina's rural counties.

⁵ Industries may have reduced employment for a number of reasons, not all of which indicate worsening sales, profits, or growth potential. In this article, however, any industry characterized by employment reduction will be termed a "contracting" industry and, conversely, any industry characterized by employment gains will be called an "expanding" industry.

Dependence on Industries with Declining Employment (Contracting Industries)

In the United States, employment in six manufacturing industries declined more than 10 percent between 1980 and 1985, when the average decline in manufacturing employment was 5.2 percent. (See Table II.) The largest employment reduction, 29.6 percent, was in primary metals followed by textiles, which declined 17.6 percent.

Manufacturing employment in North Carolina increased slightly during the same period. Only in the textile industry did employment fall by more than 10 percent.

Table II provides little support for the argument that manufacturing jobs in contracting industries were located predominately in rural areas of North Carolina. Of the twelve industries that contracted nationally, only five comprised a greater percentage of manufacturing employment in the rural than in the urban counties. Also, only two of the six industries that experienced employment declines in North Carolina had relatively more manufacturing in rural counties. Therefore, the data in Table II suggest that rural counties in North Carolina were not more susceptible than urban counties to downturns between 1980 and 1985 because of a dependence on industries that contracted nationally.

Employment Losses by Industry Groups in Rural versus Urban Counties

To further examine the proposition that rural counties in North Carolina lost a relatively larger percent of manufacturing employment because of an unfavorable industrial mix, total changes in manufacturing employment by Beale code were examined for the three groups of industries identified in Table II. For example, shown in Table III under the column heading "declined more than 10 percent" are percent changes in employment for the following six industries: primary metals; textiles; miscellaneous; nonelectrical machinery; stone, clay, and glass; and apparel. With these groupings, one can determine if nationally contracting industries lost more employment in rural than in urban county classes in North Carolina.

The last two rows in Table III show that manufacturing employment in urban areas of North Carolina

Table II
CHANGES IN MANUFACTURING EMPLOYMENT FROM 1980 TO 1985 IN THE UNITED STATES AND NORTH CAROLINA AND THE PERCENTAGE DISTRIBUTION OF NORTH CAROLINA MANUFACTURING EMPLOYMENT WITHIN RURAL AND URBAN AREAS

	Change in Jobs 1980-85		Proportion of Manufacturing Employment in North Carolina, 1985	
	U.S.	NC	Urban	Rural
<i>Declined More Than 10 Percent Nationally</i>				
-29.6	28.7	Primary Metals	1.4	1.2
-17.6	-15.8	Textiles	24.3	28.7
-13.4	-4.7	Miscellaneous	0.8	0.6
-12.2	18.1	Nonelectrical Machinery	8.5	3.3
-11.8	7.2	Stone, Clay & Glass	2.3	2.8
-11.3	-3.2	Apparel	8.7	14.6
<i>Declined Less Than 10 Percent Nationally</i>				
-9.8	-4.7	Tobacco	3.9	0.6
-8.6	28.5	Rubber	4.0	2.9
-8.9	-1.4	Fabricated Metals	3.8	1.8
-6.4	2.6	Food	4.9	7.0
-6.0	-5.3	Chemicals	4.7	4.0
-1.8	5.6	Paper	2.0	4.0
<i>Increased Nationally</i>				
0.4	3.4	Lumber	3.2	7.5
1.2	6.6	Instruments	1.3	1.3
4.1	53.1	Transportation Equipment	3.1	1.7
4.5	18.2	Electronic Machinery	8.5	5.7
6.2	2.9	Furniture	10.3	10.2
13.3	29.3	Printing	3.9	1.4
-5.2	0.2	TOTAL MANUFACTURING	99.6*	99.6*

* Totals do not add to 100 because leather and petroleum are excluded. These two industries have relatively few employees in North Carolina.

rose 1.3 percent from 1980 to 1985, while manufacturing employment in rural areas fell 2.3 percent. Manufacturing employment growth in rural counties, however, was actually stronger than in urban counties for industries that lost employment nationally. It was in the industries that gained employment nationally that employment growth in rural areas was slower.⁶

⁶ The same conclusion was drawn when the mean changes in county manufacturing employment were considered by the industry groups shown in Table III and by Beale code. Larger standard deviations, however, were generally associated with the mean employment changes in the rural county classes.

Table III

**PERCENTAGE CHANGES IN MANUFACTURING EMPLOYMENT FOR
DESIGNATED INDUSTRY GROUPS BETWEEN 1980 AND 1985**

Beale Code	Total Manufacturing	Industries Where National Manufacturing Employment		
		Declined More Than 10 Percent	Declined Less Than 10 Percent	Increased
(Percentage Change in Manufacturing Employment)				
2	2.6	-8.0	15.3	18.7
3	2.8	-4.7	9.5	-4.8
4	-3.1	-11.2	13.2	21.7
5	-4.8	-13.5	16.3	-0.3
6	-3.2	-7.3	2.3	-0.7
7	-1.7	-0.6	7.8	-8.0
8	5.3	27.7	-29.4	11.0
9	-1.6	-10.0	93.3	-11.8
URBAN	1.3	-8.4	1.1	20.8
RURAL	-2.3	-4.2	9.2	-4.4

**Employment Concentrations by
Selected Industry**

When the concentration of each industry's employment is considered, it appears that some of the nationally declining industries were more concentrated in rural counties. As Table IV shows, in 1980 over half of all manufacturing employment in six urban and ten rural North Carolina counties was in textiles, the industry that recorded the second largest employment decline nationwide. Also, more than 30

percent of the manufacturing employment in thirty-five North Carolina counties was in textiles, and twenty-one of these thirty-five counties were rural. As is also shown in Table IV, the apparel and lumber industries in North Carolina were relatively concentrated in rural counties.

The data thus indicate that while some individual rural counties might well have lost relatively more manufacturing employment as a result of the turbulent economic environment of the early eighties, such

Table IV

**EMPLOYMENT CONCENTRATIONS AS A PERCENT OF THE COUNTY'S TOTAL
MANUFACTURING EMPLOYMENT FOR SELECTED INDUSTRIES, 1980**

	Number of Counties					
	30% or More of Total Employment		50% or More of Total Employment		80% or More of Total Employment	
	Urban	Rural	Urban	Rural	Urban	Rural
Food	0	5	0	0	0	0
Textiles	14	21	6	10	1	0
Apparel	1	15	0	9	0	1
Lumber	0	9	0	3	0	1
Furniture	4	3	1	1	0	0
Paper	0	3	0	0	0	0
Chemicals	1	2	0	1	0	1
Nonelectrical Machinery	1	4	0	0	0	0

losses were not generally characteristic of the rural counties of North Carolina.⁷

INFLUENCES FROM RAPID DOLLAR APPRECIATION

Analysts often associate the decline in rural manufacturing employment from 1980 to 1985 with the decline in the world demand for U.S. manufactured goods caused by the concurrent rapid dollar appreciation. For example, William H. Branson and James P. Love found that in the entire nation, ". . . the more rural the state, the more sensitive manufacturing employment in the state is to foreign trade."⁸

This section reports on a new attempt to see if the change in the foreign exchange value of the dollar did in fact affect manufacturing employment growth in North Carolina between 1980 and 1985. A single equation regression was used.

Regression Model

In an effort to capture the effect of increases in the exchange rate on manufacturing employment by county, a real exchange rate was created for each county, weighted to take account of the county's industry mix. Each county-specific exchange rate was calculated as a weighted average of real industry-specific exchange rates.⁹ The weights were percentages of manufacturing employment in each county in 1980 at the 2-digit SIC level. (See the Appendix for the changes in the exchange rate between 1980 and 1985 for all counties in North Carolina.)

The change in the foreign exchange value of the dollar, which were county-specific and industry-weighted, was assumed to be inversely related to industry output and thus to manufacturing employment. As the dollar appreciates, for example, domestic goods become more expensive to foreigners and foreign goods become cheaper to U.S. consumers, all other things equal. The counties with

industry mixes that showed the largest dollar appreciation thus were expected to show the largest reductions in manufacturing employment.

The Beale code of each county was also included in the regressions to test the hypothesis that rural areas suffered greater percentage losses in manufacturing employment than urban areas. The Beale code coefficient was expected to be inversely related to changes in manufacturing employment.

Regression Results

Separate regressions were run for counties that gained manufacturing employment and counties that lost employment. As shown in the box, the exchange rate variable was not found to be significant in either regression. In the regression of counties that lost manufacturing employment, only the Beale code variable was significant.¹⁰

The regression results thus provide no support for the notion that the changes in North Carolina's manufacturing employment from 1980 through 1985 resulted from increases in the exchange rate.

The Beale code coefficient was not significant in the regression of counties that gained manufacturing employment from 1980 to 1985, but it was significant and negative for the counties that experienced a loss in manufacturing employment. This result suggests that the rural-urban character of the county played a role in the manufacturing employment change only when counties lost jobs: when counties lost manufacturing employment, rural counties lost the larger percentage.

CHANGES IN EMPLOYMENT FOR THREE MAJOR INDUSTRIES

The regressions indicated that rural areas showed greater employment losses only among counties where employment declined. Therefore, the three manufacturing industries—textiles, apparel, and chemicals—in North Carolina that lost the most jobs between 1980 and 1985 are examined to see if the

⁷ For a study of rural-urban changes from 1980 to 1985 in manufacturing employment for all counties in the nation, see Dan M. Bechter and Christine Chmura, "The Competitiveness of Rural County Manufacturing During a Period of Dollar Appreciation," *Regional Science Perspectives*, forthcoming.

⁸ William H. Branson and James P. Love, "The Real Exchange Rate and Employment in U.S. Manufacturing: State and Regional Results," National Bureau of Economic Research, Inc., Working Paper No. 2435 (1987), p. 16.

⁹ The real industry-specific exchange rates were obtained from Kent Hill at the Federal Reserve Bank of Dallas.

¹⁰ The regression models shown also included variables for manufacturing wage levels in 1980, education levels in 1980, and the change in manufacturing wages from 1980 to 1985. In the regression of counties that gained employment, only the change in wage variable was significant. When the regression was run with all counties—those whose employment increased and those whose employment decreased—problems were encountered with heteroscedasticity. After the data were weighted by the variance of the employment variable, the transformed model produced no statistically significant coefficients. In the original regression that was run with all counties, the exchange rate and the change in wage variables were significant at the 1 percent level.

<i>Gains in Employment: 43 observations (t statistic in parentheses)</i>			
EMPL8085 = Intercept	+ Change in Exchange Rate	+ Beale Code	\bar{R}^2
-0.478	1.556	0.027	.35
(-0.86)	(1.31)	(1.38)	
<i>Losses in Employment: 57 observations (t statistic in parentheses)</i>			
EMPL8085 = Intercept	+ Change in Exchange Rate	+ Beale Code	\bar{R}^2
0.052	0.085	-0.021	.14
(0.22)	(0.18)	(-2.65)	

declines in these particular industries affected the county's overall manufacturing employment. First, a brief overview of the most important forces that affected these industries from 1980-85 is presented. Then this section examines which Beale code classes lost the greatest proportion of jobs in the textile, apparel, and chemical industries (see Table V) and how these losses affected total manufacturing in the county.

Textiles

The textile industry was especially affected by the changing economic environment of the early to mid-1980s. The dollar volume of textile imports rose over 60 percent in real terms between 1980 and 1985. Perhaps because of pressures from foreign competitors, the textile industry underwent a consolidation. Many firms merged, downsized, or closed completely. Consequently, the number of textile firms in North Carolina dropped by 730 to about 12,000 in 1985.

As the textile firms became fewer, however, the remaining firms were becoming more productive.

The textile industry made record amounts of capital expenditures in 1981, 1984, and 1985, and reduced employment substantially in the early 1980s. The technological improvements ultimately made the industry more competitive. As a result, the textile industry recorded record profits in 1986 and 1987.

Although 26 percent of all manufacturing jobs in North Carolina were in the textile industry in 1985, the loss of almost 40,000 textile jobs in the state between 1980 and 1985 caused surprisingly little change in the total manufacturing employment of its counties. Although thirteen of North Carolina's one hundred counties lost over 30 percent of their textile jobs, in none of those counties did those lost jobs exceed 2 percent of the county's total manufacturing employment. Moreover, four of the thirteen counties that lost textile jobs gained total manufacturing jobs from 1980 to 1985.

From 1980-85, while overall textile employment was falling in North Carolina, textile employment increased by more than 30 percent in eight counties, most of which were rural. In fact, textile jobs in one rural county increased by 550 workers. More-

Table V

EMPLOYMENT LOSSES IN TEXTILES, APPAREL, AND CHEMICALS, 1980-85

Industry	Total Jobs Lost	Number of Counties					
		Lost More than 30% of Industry Jobs		Lost More than 80% of Industry Jobs		Gained More than 30% of Industry Jobs	
		Rural	Urban	Rural	Urban	Rural	Urban
Textiles	39,807	4	9	2	2	6	2
Apparel	2,812	8	6	3	0	12	5
Chemicals	2,099	9	3	3	1	6	13

over, in Beale codes 8 and 9 textile employment increased 71 percent and 8 percent, respectively.

Textile industry employment fared somewhat better in North Carolina than it did nationally. United States employment declined 18 percent between 1980 to 1985, compared with a 16 percent decline in North Carolina. The relative advantage of the textile industry in North Carolina and its most rural counties may be due, in part, to its lower wages. According to a study of location decisions of manufacturers, relocations are “. . . often in response to a decline in sales or profits. Relocations will benefit relatively low-cost locations, especially areas which are seen as having low labor costs.”¹¹ In 1985, the average annual income for textile workers in the nation was \$15,956, compared with \$14,396 in North Carolina and \$12,222 in Beale codes 8 and 9. Textile wages in North Carolina, however, are higher than in 17 other states in the nation. Thus, the state's competitive advantage in textiles cannot be totally explained by low wages.

Apparel

The apparel industry employs about one-third as many persons in North Carolina as does textiles. Although national import penetration was stronger in the apparel industry than in textiles (the real dollar value of apparel imports doubled between 1980 and 1985), considerably fewer apparel jobs were lost in North Carolina: 2,310, compared with almost 40,000 jobs in textiles.

Fourteen counties in North Carolina lost more than 30 percent of their apparel jobs, and a little over half of these counties were rural. The decline in apparel jobs, however, was less than 2 percent of the counties' total manufacturing jobs in all but two counties where the apparel jobs lost were 5 percent of the counties' manufacturing employment. Six of these fourteen counties gained total manufacturing jobs during 1980 to 1985.

Twenty-two rural counties showed gains in apparel employment, as did fifteen urban counties. Moreover, gains in apparel employment exceeded 30 percent in seventeen North Carolina counties; most of which were rural, and apparel employment in two rural counties grew by more than 200 percent.

As in the textile industry, employment in the apparel industry in North Carolina fared better than that of the nation. National employment dropped 11 percent, but employment fell only 3 percent in North Carolina. In the case of North Carolina's two most

rural classes (Beale codes 8 and 9), however, employment fell more than in the nation, 27 percent and 12 percent, but there was a gain of 759 apparel workers in the other two rural categories (Beale codes 6 and 7).

Wages could explain part of the relative gain in apparel jobs in North Carolina. Apparel workers in the nation received an annual average income of \$12,569 in 1985, compared with \$9,000 in North Carolina and \$8,876 in its two most rural areas. Wage differentials, however, do not explain why Beale codes 6 and 7 recorded increases in employment while Beale codes 8 and 9, where wages were lower, showed declines. Perhaps the wage differential was so small that other factors such as access to better highway systems, proximity to textile plants, or availability of skilled labor caused apparel employment to grow faster in Beale codes 6 and 7.

Chemicals

Although the chemical industry accounted for only about 5 percent of North Carolina's manufacturing jobs, its employment in the state declined by 2,099 persons from 1980 to 1985. Most of the decline in jobs occurred from 1980 to 1983 because of two forces: 1) the output of three major sectors (transportation equipment, construction, and agriculture) that substantially affect the level of shipments of chemicals fell sharply throughout the nation, and 2) oil, which is used in producing many chemical products, fluctuated widely in price, rising more than 15 percent between 1980 and 1981.

Even though two-thirds of North Carolina's chemical output was synthetics and plastics instead of the more recession-resistant drugs and cleaning products, employment in the chemical industry in North Carolina contracted 5 percent from 1980 to 1985, compared with 6 percent in the nation. The largest employment losses occurred in rural areas. Nine of the twelve counties where employment declined more than 30 percent were rural. In three rural counties, chemical jobs declined more than 80 percent. In none of these counties, however, was the loss in chemical jobs more than 1 percent of all manufacturing jobs.

The largest percentage gains in chemical industry employment were located in urban areas. Thirteen of the nineteen counties in which chemical industry employment increased more than 30 percent from 1980 to 1985 were urban. Some rural areas had large employment gains, however. In one rural county, for example, chemical employment increased from six to eight hundred forty-one workers from 1980-85 and in another it increased from one to seventy-three workers.

¹¹ Eva Mueller and James N. Morgan, "Location Decisions of Manufacturers," *American Economic Review* 52 (May 1962): 215.

Similar to the textile and apparel industries, the competitive advantage of the North Carolina chemical industry may be a result of its relatively low wages. North Carolina's annual average wage in the chemical industry in 1985 was \$20,563 compared with \$30,699 for the United States (North Carolina ranks 14th).

Conclusions

Manufacturing employment in North Carolina rural areas declined 2 percent from 1980 to 1985, compared with a gain of 1 percent in urban areas. Not all rural counties were equally harmed by the turbulent economic environment that existed during this period, however, and manufacturing employment declined in only a small number of rural counties.

Most rural counties were not at a competitive disadvantage to urban counties because of an unfavorable industrial mix, but there were exceptions. Rural areas as a whole did not hold a greater proportion of the nationally declining industries but some rural counties were comprised of a greater proportion of declining industries, particularly textiles. Moreover, a regression analysis suggested that movements in

the foreign exchange value of the dollar between 1980 and 1985 did not have a statistically significant effect on changes in manufacturing employment in North Carolina counties. Among counties experiencing declines in manufacturing employment, however, the regression results suggested that rural counties experienced greater losses than urban counties.

The case studies of the textile, apparel, and chemical industries in North Carolina indicated that wages within the state, and especially within its rural areas, were much lower than the national average. In some industries, this wage differential may have been a factor that gave North Carolina a competitive edge, allowing the state to grow in spite of the vicissitudes of the early 1980s. Other factors that may also have played a role in North Carolina's employment growth include: state and county policies such as low taxes and high education expenditures as well as a favorable business climate.¹²

¹² North Carolina was rated in the top 10 states in the nation for its favorable manufacturing climate for each year from 1981 through 1985 according to Alexander Grant & Company, *General Manufacturing Climates of the Forty-Eight Contiguous States of America* (Chicago: Alexander Grant & Company), various issues.

APPENDIX

Percent Increase in North Carolina Real County-Specific Exchange Rates 1980-85

Alamance	39.84	Johnston	36.69
Alexander	32.74	Jones	38.33
Alleghany	42.69	Lee	36.37
Anson	40.44	Lenoir	40.39
Ashe	33.86	Lincoln	38.00
Avery	37.63	McDowell	39.45
Beaufort	36.85	Macon	35.18
Bertie	36.93	Madison	33.09
Bladen	35.39	Martin	30.81
Brunswick	41.69	Mecklenburg	36.40
Buncombe	36.14	Mitchell	35.69
Burke	36.33	Montgomery	39.27
Cabarrus	42.02	Moore	37.44
Caldwell	32.93	Nash	38.25
Camden	28.02	New Hanover	35.52
Carteret	31.71	Northampton	33.25
Caswell	41.23	Onslow	35.94
Catawba	34.85	Orange	33.22
Chatham	37.67	Pamlico	37.96
Cherokee	35.30	Pasquotank	30.68
Chowan	35.15	Pender	35.20
Clay	40.92	Perquimans	39.69
Cleveland	39.21	Person	38.43
Columbus	33.54	Pitt	38.27
Craven	31.80	Polk	40.11
Cumberland	34.95	Randolph	36.15
Currituck	34.16	Richmond	39.10
Dare	47.73	Robeson	37.70
Davidson	33.86	Rockingham	41.09
Davie	36.02	Rowan	38.76
Duplin	39.33	Rutherford	39.16
Durham	38.84	Sampson	39.39
Edgecombe	37.84	Scotland	38.24
Forsyth	39.76	Stanly	38.75
Franklin	34.84	Stokes	37.59
Gaston	39.61	Surry	39.72
Gates	26.10	Swain	37.32
Graham	32.94	Transylvania	31.47
Granville	39.17	Tyrrell	30.42
Greene	38.71	Union	36.56
Guilford	37.26	Vance	40.09
Halifax	35.56	Wake	34.50
Harnett	37.54	Warren	33.96
Haywood	28.34	Washington	35.43
Henderson	35.12	Watauga	33.18
Hertford	34.44	Wayne	35.76
Hoke	40.98	Wilkes	36.75
Hyde	36.82	Wilson	38.05
Iredell	36.60	Yadkin	38.77
Jackson	36.95	Yancey	39.37