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A QUALITATIVE AND QUANTITATIVE ANALYSIS  
OF THE REDISTRIBUTION OF REGIONAL  
ECONOMIC GROWTH

THESIS

Presented to the Graduate Council of the  
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By

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Utilizing shift/share and economic base analysis, data covering employment, income, and population are analyzed for each of the nine regions of the United States as defined by the Census Bureau. The study covers 1970 through 1984 because widespread redistribution of employment and a shift toward more service-oriented, white collar jobs occurred during this period.

This study presents current trends and recommends ways in which people may better prepare for the future.

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## CHAPTER I

Upon this first, and in one sense this sole, rule of reason, that in order to learn you must desire to learn, and in so desiring not to be satisfied with what you are already inclined to think, there follows one collary which itself deserves to be inscribed upon every wall of the city of philosophy: "Do not block the way of inquiry."

Charles Sander Pierce

Upon this very statement above, that is one reason to endeavor upon an analytical and descriptive analysis of regional industrial growth. In particular, regional industrial growth can be analyzed to determine where and in what specific industries this growth is occurring. Regional growth over the last few years has become a highly researched issue or topic. Partially this research endeavor by regional economist, geographer, and labor economist has been in response to the expanding acceptance of regional growth theory and the discipline of regional economics. There have been many books, articles, and essays written on the subject of regional growth and where it is occurring, and on the subject of regional growth theory. This analysis will be concerned with regional growth within the industrial structure of each region with particular attention on the

manufacturing sector. Regional growth will be analyzed by way of industrial employment, population, and per-capita income. The major emphasis will be on employment. This unit of measurement was chosen because regional growth can be analyzed by observing changes in a region's employment levels. It also can be used to depict rising and falling employment levels within a particular industry sector.

#### **Statement of The Problem**

The problem that will be analyzed is that of comparative regional economic growth by looking at the industrial structure of each of the nine regions of the United States. These regions are defined by the Bureau of Economic Analysis, and they are: (1) New England region, (2) Middle Atlantic, (3) East North Central, (4) West North Central, (5) South Atlantic, (6) East South Central, (7) West South Central, (8) Mountain, and (9) Pacific region. The problem to be addressed specifically is: where has the most and least industrial geographical redistribution of employment occurred between the years 1970 to 1980 and for the years 1981 to 1985? This analysis will be a comparative one that will shed light on this particular problem.

There have been several studies on this problem of geographical redistribution of employment. Where employment has shifted for the time periods stated above, is a major

task that will be analyzed in this paper. When one region gains employment and/or population, this normally means a sign of economic growth and increased income for that particular area. Also, when a region loses employment or population, the results are usually converse to those for a growing region.

Economic growth will also be analyzed by observing changes in industry payrolls and hourly wage rates for each region on a comparative basis. It is usually postulated that a growing region will experience increases in this economic indicator.

Population shifts are also associated with an expanding economy. The employment population ratio will be examined for selected years for the regions. It is assumed that a rising population could be interpreted as a result of expanding opportunities and jobs, assuming that births to deaths ratio is not a factor. Normally people will move to take on better jobs and to increase their standing of living.

These economic indicators will be analyzed from both a descriptive and an analytical perspective. Measured by changes in employment, population, and income, a substantial geographical redistribution of economic activity took place between 1970 to 1985. This regional pattern of differential growth has been a persistent one for the last thirty years. Though many broad generalizations can be made concerning

regional economic changes in an economy as large and diverse as the United States, even the alert observer finds it difficult to note and weigh the total pattern of change. With a multiplicity of industries and geographic areas, consideration of the performance of each industrial-regional combination over a given time period becomes a formidable task in the handling of information.

#### **Purpose of the Study**

The purpose of the study is to determine in which regions of the United States that the regional distribution of employment, population, and rates of increase in income have occurred for the study period. In analyzing the industrial structure for each of the regions of the United States, it can be observed where employment has risen or declined and in which particular region. Knowing this information is important for several reasons. One reason is that economic growth determines jobs and employment opportunities. Secondly, in order to develop policies designed to increase job availability, it is imperative to know whether a particular region is service oriented or heavily oriented toward heavy industry. Similarly, the analysis of industrial employment can help to understand a region's growth potential and its response to fluctuations in business cycles, inflation, and structural employment. Once again the purpose is to describe these patterns in an effort



to understand regional growth and its direction. In addition to what has been said above, for the practical analysts, in order to develop employment training programs, such as job corps, C. E. T. A., and other types of programs such as Operation Mainstream, Job Opportunities in the Business Section (JOBS), it is important to know the industrial composition of a particular region.

The same explanations would also apply to analyzing changes in income and population. Normally in high-tech jobs, wages would tend to be higher as opposed to most service jobs. By observing changes in sector income, it could be used as a factor in depicting which industries are experiencing growth and decline. This is important for the simple fact that if a particular industry loses jobs, then it is reasonable to assume that that particular industry will also lose earnings. In addition, it could be observed how a particular industry earnings are affected by changes in the national economy.

Population is an important factor in analyzing regional change and regional growth. A region will tend to experience an increase in migration from other regions when there are better job opportunities. For example, when everyone was moving to California and the West searching for gold. Similarly, the South experienced population increases due to the employment opportunities of the Sunbelt states.

In sum, the purpose of this study is to present an analysis of the industrial employment by regional analysis of income and population, and its change over the period 1970 to 1985. This analysis is useful first of all in understanding the nature of local industrial employment change, particularly in regard to the impact of national economic forces on the regional or local economy. For the industrial structural analysis, the following questions will be addressed: (1) what was the industrial employment structure of the region for the period 1970 to 1985; (2) what is the region's economic base; (3) how has the industrial structure of the region changed over the period 1970 to 1980; (4) what are the sources of the 1970 to 1985 employment change; (5) what impact has this change had on wages and population; and (6) why has one region has grown faster than most of the other regions. The technique of Shift/Share analysis will be presented to answer these questions in the chapters below. The technique of Economic Base Analysis will also be presented to analyze a region's basic industries.

### **Hypothesis**

As stated in the above sections, this paper is both a descriptive and an analytical analysis of comparative regional economic growth. The factors analyzed are employment, income, and population. It is a descriptive analysis

of regional change. The paper does not attempt to explain fully all the factors that are responsible for regional change and growth but does discuss some of the reasons and causes of economic growth and decline. The hypotheses of the study are stated below.

(1) It is hypothesized that the redistribution of employment has shifted from the Manufacturing Belt or the Northern regions to the South and Southwestern regions between the study period of 1970 to 1980 and that the rate of increase has been reduced for the study period 1981 to 1985.

(2) It is hypothesized that the greatest amount of employment increases nationally have been within the service industries and that the rate of manufacturing employment has slowed for the study period 1970 to 1985.

(3) It is hypothesized that the growth industries have recently become more prevalent in the regions of the South and Southwest and less prevalent in the Northeast and the Northern regions.

(4) It is hypothesized that the majority of employment decentralization in the Northeast has taken place in manufacturing employment, and this structural change in the South and Southwest has been in the service industries.

(5) It is hypothesized that the industrial mix component and the regional share component of the shift/share

analysis will be positive in the South and Southwestern regions and negative in the North and Northeastern regions.

(6) It is hypothesized that the components of change in the South and Southwest are positive because of employment increase in the service sectors, and the components are negative in the North and Northeast because of a decline in manufacturing employment.

(7) It is also hypothesized that the wage rates paid in the regions are higher in the Northeast and lower in the South and Southwest, which contradicts the neo-classical view of wages seeking their highest rate of return.

(8) It is hypothesized that basic industries are responsible for employment change in the North and Northeastern regions and less important in the South and Southwestern regions.

(9) It is also hypothesized that the occupational structure will reflect a shift from blue collar occupations to white collar, service-oriented occupations.

#### **Background and Significance of the Study in Relation to Regional Analysis**

The analysis of regional change and regional growth is by no means a new pursuit on the old block. There have been several prominent scholarly individuals who have researched and analyzed regional growth. Names that come to the author's mind are Harry W. Richardson, Victor Fuchs, Lowell

D. Ashby, Martin A. Garrett, Jr., Bernard L. Weinstein, Robert Firestone, and John Rees. These studies done by the above individuals were in response to a desire to depict and know where regional growth was occurring for each respective time period that was studied. There was a desire to know what particular industries were growing and in which regions that growth was occurring, or conversely in which industries or regions it was falling or decreasing. Similarly, in being able to analyze economic growth, this process could provide descriptive explanations of why a particular action or reaction occurred in response to fluctuations in the local or for that matter national economy. Understanding and analyzing the causes is a different matter of understanding economic growth.

#### **Limitations of the Study**

The limitations of the study are of several kinds. For one, the study period is limited to the time periods of 1970 to 1980 and 1981 to 1985. These years were chosen because they represent a fairly good time period and because census data are available for 1970 and 1980.

A second limitation is that the industrial employment will be analyzed using two-digit S.I.C. classification codes. Only the major industries will be analyzed for 1981 to 1985. For 1970 to 1980, the major industries will be

analyzed in addition to several industries on a disaggregate basis, especially manufacturing.

Another limitation of the study is that the analysis is a descriptive and comparative analysis of regional change.

A fourth limitation of the study is the methodology employed. Shift/Share and Economic Base Analysis are fairly simplistic tools. They are more descriptive than analytical, but they do serve the purpose of this study. Similarly, there are some technical and conceptual differences and problems associated with these methods. They will be presented below.

#### **Summary**

In summation, the study is one of a regional nature. It is comparative and descriptive. The analysis will present changes of regional economic growth in an effort to describe that growth and where it has been occurring. There are simple explanations to explain the causes of this growth, but the list is not at all conclusive, and it is not the purpose of this paper to give a specific cause or reason for this growth or decline.

Chapter II presents a discussion of related literature on regional economic growth and decline. It presents previous studies that have tried to explain the causes of growth and regional change.

Chapter III discusses the theory and criticism of the methodologies employed in the study. These two methodologies are Shift/Share and Economic Base Analysis. Both the theory and the technical and conceptual differences are presented along with alternate theories of regional growth.

Chapter IV presents the analysis of both Shift/Share and Economic Base as it relates to employment and occupations. Chapter IV also includes qualitative studies on employment-population ratios by region, wage studies by select regions, unemployment trends, and a study on specific occupational trends.

Chapter V is the conclusion of the study along with a discussion of the analysis and results for further references and also a discussion of how the results could be utilized for policy recommendations.

## CHAPTER II

### REVIEW OF SELECTED RELATED LITERATURE

#### A. Some Discussion of the Cause of Regional Economic Growth

In a review of the selected related literature on regional change in terms of employment, income, and population, it is appropriate to start with an historical view of the literature. Much of the earlier analysis of regional economic growth or even the study of regional economics emerged in quite early. One of the earlier studies of the determinants of the redistribution of economic and manufacturing in the United States was done by Victor R. Fuchs.<sup>1</sup> During this period of 1929 to 1958 there had been a substantial change in the location of manufacturing in the United States. This change had an impact and a significant impact on the political, social, and economic life of the nation. Also, the study was primarily one concerned with determinants of this locational change. Even though locational theory has always been a part of the literature concerning

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<sup>1</sup>Victor F. Fuchs, "The Determinants of the Redistribution of Manufacturing in the United States since 1929," Review of Economics and Statistics, 44 (May 1962), pp. 167-177.



economics, it will not be presented as part of this analysis. It will only be discussed in reference to the theories of economic growth. The article by Victor Fuchs<sup>2</sup> was an attempt to understand why the location of manufacturing occurred the way it did. For example, in 1929 the South and West together accounted for less than one out of every four United States manufacturing employees and for only one-fifth of the value added by manufacturing.<sup>3</sup> By 1958, their share of United States manufacturing had increased to one-third as measured by either variable.

Why did this occur? What were the historical developments and economic forces that determined its extent and direction? Fuchs attempted to answer these questions and also rejected the hypothesis that regional shifts in "demand" or "markets" were the major determinant of locational change.<sup>4</sup> Between 1929 and 1954 the South and the West experienced very large comparative gains in manufacturing employment. This was primarily the result of regional differentials in the rates of growth of individual industries, not of differences in the industrial structure.<sup>5</sup>

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<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid.

<sup>5</sup>Ibid.

Fuchs commented that this case cannot be taken as conclusive because the opposite situation occurred in England in the inter-war decade of that country.<sup>6</sup> Fuchs found in his study that differentials attributable to the redistribution of individual industries were typically larger than those attributable to industrial structure.<sup>7</sup> Industrial structure was of greatest relative influence in the South Atlantic, East South Central, and the Mountain divisions, where a larger than average proportion of slow growing industries (nationally) had a retarding impact on industrial growth.<sup>8</sup> These divisions all increased their share of United States manufacturing, but the increase in individual industries was much greater than the overall increase because of the unfavorable industrial structure. In New England, an unfavorable industrial structure accounted for either one-fifth or two-fifths of the overall comparative loss of manufacturing, depending on whether one looks at value added or total employment.<sup>9</sup>

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<sup>6</sup>Ibid.

<sup>7</sup>Ibid.

<sup>8</sup>Fuchs, op. cit., p. 166.

<sup>9</sup>Ibid.

The division with the most favorable industrial structure was the East North Central, but the influence on overall comparative growth was not great.<sup>10</sup> Industrial structure was slightly favorable in the Middle Atlantic, Pacific, and the West North Central, and slightly unfavorable in the West South Central.<sup>11</sup> While the complex interrelation between changes in employment, income, and population do not permit one to draw conclusions with certainty as to which was the causal factor in any specific situation, he concluded that "demand" or "markets" has not been the primary determinant of locational change.<sup>12</sup> To say that shifts in markets have not been the primary determinant of location change is not to deny the importance of the growth of locally oriented industries as part of the process of industrialization in an area.<sup>13</sup> In his paper, Fuchs attempted to isolate the crucial factors in locational change since 1929, rather than to develop a full theory of regional growth.

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<sup>10</sup>Ibid.

<sup>11</sup>Ibid.

<sup>12</sup>Ibid.

<sup>13</sup>Ibid.

The second objective of Mr. Fuchs's study was to test the "demand" hypothesis for the geographic regions in explaining changes in the distribution of manufacturing employment. Before attempting his analysis, some clarification of the problem was presented. Firstly, he rejected the notion that a higher correlation between population and manufacturing employment, or between regional shifts in these two variables, provides significant support for the importance of demand. Secondly, it was important that the analysis of changes in location should not be confined to physical movement of plants from one area to another or to the appearance of new firms in an area. He defined locational change as the difference between the actual level of manufacturing in an area at the end of a period and what the level would have been in the area had grown at the national rate.<sup>14</sup> If the area grew more slowly, the difference between the actual and the hypothetical level is a "comparative loss." If the area grew faster than the United States as a whole, this was referred to as a "comparative gain." By summing these comparative gains and losses across all the states, Fuchs obtained a measure of redistribution or mobility for each industry. Such comparative gains and

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<sup>14</sup>Ibid.

losses had been computed for 221 manufacturing industries by the State and Census division, for the period 1929 to 1954. The 221 industries included virtually all manufacturing. For a full discussion of the scope and method as well as the industry conversion table used to make the 1929 Census industries comparable with those for 1954, see Fuchs's article entitled "Changes in the Location of Manufacturing Since 1929."<sup>15</sup> In his article, the principal phenomenon that was explained is the shift of manufacturing to the South and West. The result for the South Atlantic region was that the redistribution of the textile was the predominant force in the comparative gains of manufacturing.<sup>16</sup>

Within this industry sector in manufacturing, cotton led the list, synthetic textiles was second, and hosiery third.<sup>17</sup> The total comparative gain in the three industries, which totalled 173,000 employees, was more than that of the next eight largest comparative gains combined.<sup>18</sup> Fuchs concluded that there was no reason to believe that demand was a

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<sup>15</sup>Ibid., p. 170.

<sup>16</sup>Victor R. Fuchs, "Changes in the Location of U. S. Manufacturing Since 1929," Journal of Regional Science, 1 (1959), pp. 1-17.

<sup>17</sup>Fuchs, "Determinants of Redistribution," pp. 167-177.

<sup>18</sup>Ibid., p. 170

significant factor for the other industries with large comparative gains.<sup>19</sup> He concluded that as a group, the industries were no less market oriented than are the industries with comparative gains.<sup>20</sup> If not for demand, then what factors were responsible for the comparative gains? Fuchs argued that the abundant supply of unskilled labor in the South Atlantic was probably the principal factor underlying the comparative gain, hence a new hypothesis.<sup>21</sup> Seven of the largest comparative gains were in industries that had national average hourly earnings per production worker of less than \$1.40 in 1954.<sup>22</sup> Only three of the fifteen paid had wages of more than \$1.60 per hour, and the median was \$1.42.<sup>23</sup>

For the East South Central and West South Central divisions, the results were similar to each other. In the East South Central division, comparative gains in textiles were much less important, while those in apparel much more so.<sup>24</sup> Also, comparative gains were in such high-wage

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<sup>19</sup>Ibid.

<sup>20</sup>Ibid., p. 171.

<sup>21</sup>Ibid.

<sup>22</sup>Ibid.

<sup>23</sup>Ibid.

<sup>24</sup>Ibid.

industries as chemical, pulp and paper, electrical machinery, and aircraft.<sup>25</sup> Once again there was nothing in the pattern to suggest that market demand was a dominant factor.<sup>26</sup> Fuchs commented that the two largest comparative gains, in apparel, were probably labor-oriented.<sup>27</sup> The next two largest, in chemicals and pulp and paper, were probably in response to the attraction of natural resources.<sup>28</sup>

In the West South Central region, the largest comparative gains were in chemical, aircraft, and machinery whereas the comparative losses were in logging, sawmills, and millwork.<sup>29</sup> Fuchs attributed these gains in aircraft and chemical to better climates and proximity to natural resources.<sup>30</sup>

In the Pacific region, the industries with the largest comparative gains were aircraft and parts, electrical machinery, logging and sawmills, and machinery.<sup>31</sup> The most

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<sup>25</sup>Ibid., p. 172.

<sup>26</sup>Ibid.

<sup>27</sup>Ibid.

<sup>28</sup>Ibid.

<sup>29</sup>Ibid.

<sup>30</sup>Ibid.

<sup>31</sup>Ibid.

important locational factors were probably climate and the cost advantages in production, storage, testing, and delivery.<sup>32</sup> Fuchs also substantiated this by citing a study done on the aviation industry.<sup>33</sup> The other comparative gains in logging and sawmills were probably the result of the exhaustion of forests in the central part of the country, and the latter was largely oriented to low cost hydro-electric power.<sup>34</sup> He commented that it is true that some comparative gains in electrical machinery occurred because the aircraft industry was "their" market, but in such cases demand was a derivative factor, not a primary one.<sup>35</sup>

As in the case with the South Atlantic region, of the fifteen largest comparative gains, twelve were in industries that had a national average hourly wage for production workers of over \$1.90.<sup>36</sup>

In conclusion, between 1929 and 1954 the South and West experienced very large comparative gains in manufacturing employment. This was probably the result of regional

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<sup>32</sup>Ibid., p. 175.

<sup>33</sup>Ibid.

<sup>34</sup>Ibid.

<sup>35</sup>Ibid.

<sup>36</sup>Ibid.



differentials in the rates of growth of individual industries, not of differences in the industrial structure.<sup>37</sup> Industries most clearly recognized as being "market-oriented" did not shift as much as did the others. For the South and West, Fuchs found very little support for the demand hypothesis except in Florida and some mountain states. The supply of unskilled labor appeared to be the most significant locational factor for the South Atlantic region while in the East South Central region, both labor and natural resources played a role.<sup>38</sup> Also, in the West South Central region natural resources were the most significant.<sup>39</sup> Similarly, natural resources appeared to be a key factor sparking the industrial growth of the West.<sup>40</sup>

A similar study on growth in manufacturing in the South and a study on regional industrial development were done by Martin A. Garrett, Jr. for the study period 1947 to 1958.<sup>41</sup> Two factors made this period particularly apropos: (1) the

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<sup>37</sup>Ibid.

<sup>38</sup>Ibid., p. 177.

<sup>39</sup>Ibid.

<sup>40</sup>Ibid.

<sup>41</sup>Martin A. Garrett, Jr., "Growth in Manufacturing in the South 1947-1958," Southern Economic Journal, 33 (1968), 352-364.

change in the South's manufacturing base between 1929 and 1947 and (2) the extent and type of growth that occurred in the South relative to national growth.<sup>42</sup> In the study by Martin Garrett, Jr., his purpose was to examine the influence of the determinants of the growth in southern manufacturing during 1949 to 1958. It is necessary to point out that it is apparent that the interaction of several factors determines the location of an industry. The analysis classified the study group industries by using 3-digit S.I.C codes. It was thus possible to examine and compare the growth in southern manufacturing which is attributable to those industries that: (1) are attracted because of the availability of natural resources, (2) tend to locate near markets, (3) are attracted to a relatively low wage area and, in addition, the data permitted an insight into (4) the influence of national demand. The study provided an insight into growth in manufacturing that can be attributed to the industries that favor the South relative to the nation compared with the growth that resulted from national growth. Similarly the analysis encompasses aggregate growth, growth by study-group industries, and sources of southern manufacturing growth. The method of analysis used was the same

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<sup>42</sup>Ibid.

one used by Fuchs.<sup>43</sup> The data were derived from the Census of Manufacturers.

The aggregate growth in manufacturing in total employment evidenced gains for the South compared with the nation. The absolute increase in total employment of 366,454 in the South represented an increase of 17.5 percent compared with 7.6 percent for the nation during 1947-1958.<sup>44</sup> The absolute growth in the South represented 33.3 percent of growth in all manufacturing for the nation during the study period.<sup>45</sup> The values were similar when value added was used as the reference variable.<sup>46</sup>

The breakdown of growth by industry permitted determination of which industries significantly affected the South's industrial structure and which industries experienced the most significant gains or losses during this period. The data that were presented were interpreted in the following manner: the employment differential measures the extent to which manufacturing employment of each industry in the South

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<sup>43</sup>Fuchs, "Changes in Location of Manufacturing," pp. 1-17.

<sup>44</sup>Garrett, op. cit., p. 354.

<sup>45</sup>Ibid., p. 355.

<sup>46</sup>Ibid.

was greater or less than the employment would have been if the industry had grown nationally at the same rate as well manufacturing and if the South had maintained its proportionate share of the industry. A positive employment differential indicated that this industry grew faster than total manufacturing at the national level, and/or that the South increased its share of this industry relative to the nation. A negative employment differential indicated that this industry did not grow as fast as total manufacturing and/or that the South failed to maintain its share of this industry. The employment differential, therefore, was divided into only two categories -- the industry differential and the area differential. The industry differential demonstrated the influence of the national rate of growth of the particular industry relative to all manufacturing. Thus it measured that portion of the employment differential that may have been attributed to differences in industry rates of growth at the national level. The area differential showed the extent to which a particular industry grew faster or slower in the South than it did for the nation as a whole.

The data presented in this study indicated that the study group industries did exert a strong influence on the employment differential experienced by the South. These industries included textile mill products residual, -70,569;

sawmills and planing mills, -98,878; machinery, except electrical and electrical machinery residual, 64,695; men's and boys' furnishings, 58,154; and transportation equipment, residual 45,910.<sup>47</sup> For the area growth differential, which is the growth that shows the extent to which each industry grew faster or slower in the region than in the nation, those displaying the largest gains included: textile mill products, 116,074; electrical machinery and machinery except electrical, 63,264; men's and boys' furnishings, 56,404; transportation equipment, 40,472; and chemicals and allied products, 37,879.<sup>48</sup>

The data presented indicated aggregate growth as well as industry changes for the South. This trend is consistent with the study by Fuchs on southern growth. The following section will be the sources of southern manufacturing growth according to Garrett. The categories in which industries were placed in this study are the following: (1) resource-oriented industries; (2) market-oriented industries; (3) labor-oriented industries; (4) multi-unit firm industries. For a discussion of which industries were classified as

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<sup>47</sup>Ibid.

<sup>48</sup>Ibid.

indicated, see this article on the study done by H. S. Perloff, Edgar S. Dunn, Jr., Eric E. Lampard, and Richard F. Muth in Resources and Economic Growth.<sup>49</sup>

For the South, the industries that were classified as resource oriented did not exert pressure in terms of increased employment. The South experienced a decline of 14,992 persons. The major categories of these industries were sawmills and planing mills, petroleum and tobacco industries, and natural resource industries.

For market-oriented industries, these were classified by Garrett using a previous classification by August Losch. For a classification, see Losch.<sup>50</sup> The South experienced relatively rapid growth in the market-oriented industries, an absolute increase of 38,993 and a comparative growth of 16,623 in total manufacturing.<sup>51</sup> Similarly, the growth rates of the South and the growth experienced by the South, which can normally be explained endogenously by industries

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<sup>49</sup>H. S. Perloff and others, Regions Resources and Economic Growth (Baltimore, Md., 1960), p. 37.

<sup>50</sup>August Losch, The Economics of Location (New Haven, 1953), p. 108.

<sup>51</sup>Ibid., p. 357.

following demand into regions with expanded population and/or income, followed the expected pattern.<sup>52</sup>

To determine the extent of manufacturing growth attributable to relative advantages of southern labor, the industries were classified as low wage or high wage labor intensive industries. Labor-oriented industries in the study by Garrett were low wage labor intensive industries, and neither of the industries that were classified as resource- or market-oriented were included in this group. The data indicated that the South continued to attract labor-oriented industries during 1947-1958.<sup>53</sup> An absolute increase of total employment of 79,919 compared with a national decline of 220,069<sup>54</sup> was itself sufficient indication not only of growth patterns, but of the influence of a low wage on the growth in southern manufacturing.

The significance of labor's role in southern growth is further evidenced by a comparison of percentage growth rates. For total employment, the comparative growth expressed as a percent is 14.0 compared with 24.7 percent for the same value after adjusting for industrial

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<sup>52</sup>Ibid.

<sup>53</sup>Ibid.

<sup>54</sup>Ibid., p. 359.

structure.<sup>55</sup> These differences indicated that in spite of a relative concentration of labor-oriented industries in the South, the concentration of these industries continued to increase while, during this period, labor-oriented industries declined nationally.<sup>56</sup> Thus the South's concentration of the labor-intensive industries compensated for the decline nationally.

Finally a substantial amount of southern manufacturing growth can be explained by national demand, but it also occurred in multi-unit firm industries.<sup>57</sup> The influence of national demand was suggested by the association between the hypothetical growth (the growth that the South could have expected had each industry grown at the national level) and the actual growth for each industry. Garrett demonstrated that the Spearman's correlation coefficient was .81, which was highly significant.<sup>58</sup>

For firms that were classified as multi-unit, Garrett used the classification used by Martin Segal.<sup>59</sup> The data

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<sup>55</sup>Ibid.

<sup>56</sup>Ibid.

<sup>57</sup>Ibid.

<sup>58</sup>Ibid.

<sup>59</sup>Martin Segal, "Regional Wage Differences in Manufacturing in the Post War Period," Review of Economics and Statistics (May, 1981).



indicated an absolute growth in these industries of 154,368 in total employment. And the comparative growth expressed as a percent was 22.3 percent for total employment and 32.7 percent for value added.<sup>60</sup> Thus multi-unit firms dominated the growth of southern manufacturing activity.

In summary, three major factors occurred in the growth in southern manufacturing during 1947-1958 that were suggested by the data: (1) the effect of growth in national demand, (2) the continuing effect of the South's competitive labor advantage, and (3) the declining importance of resource-oriented industries. As the data indicated, the most impressive growth occurred in the multi-unit firm industries. Similarly, the national growth in manufacturing activity that occurred in branch plants and the close association between the hypothetical growth and the actual growth for the multi-unit firm and non-classified industries in the South did suggest the importance of national demand as well as regional demand.

Thus, the pattern of growth that occurred in southern manufacturing activity during 1947-1958 supported two major

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<sup>60</sup>Ibid., p. 361. Also see a model of aggregate growth presenting this same hypothesis in G. H. Borts and Jerome L. Stein, Economic Growth in a Free Market, (New York, 1964).

hypotheses: (1) although regional growth appeared to be dominated by national demand,<sup>61</sup> the growth of a region does not depend upon the national pattern of growth facing its industries. Differential growth occurred because a given industry grows at different rates in different regions.<sup>62</sup> Secondly, the regional growth in manufacturing of an underdeveloped region within an advance economy will occur in the form of multi-unit firms.

There have been other studies on regional growth and manufacturing growth as well as overall industry growth. Also, these studies all gave reasons and causes of regional growth patterns and growth trends on a regional basis. In a further discussion of regional change, there still persist differences among the various regions.. Specifically, recent studies have been done on the question of why has continued growth occurred in the South and in which industries this growth has occurred or been most striking. The next few paragraphs will be devoted to an analysis of these studies and their interpretation.

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<sup>61</sup>Ibid., p. 361. Also this conclusion concurs with the study done by Borts and Stein concerning interstate and interindustry growth patterns.

<sup>62</sup>Ibid.

Present studies have been concerned with industrial migration and its importance to the growth of the Sunbelt. In recent years a number of major firms have moved their corporate headquarters from northern to southern cities. For instance, Coca Cola moved from New York to Atlanta; Shell Oil from New York to Houston; Mobile Oil from New York to Fairfax, Va.; National Gypsum from Buffalo to Dallas; and Gardner-Denver from Quincy, Ill., to Dallas. This movement has helped to create the notion that industrial migration is playing a major role in the economic growth of the Sunbelt.

This hypothesis has been tested by several well-known authors. Peter Allaman and David Birch,<sup>63</sup> working with data from the Dun and Bradstreet files, tabulated and analyzed employment changes for 3.5 million firms between 1960 and 1972. Net employment change for each region was defined as the result of births, deaths, expansions, contractions, in-migration, and out-migration. The data indicated a very small proportion of regional employment change can be attributed to in-migration or out-migration of firms. Births and expansions, by contrast, varied significantly

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<sup>63</sup>Peter A. Allaman and David L. Birch, "Components of Employment Change for States by Industry Group, 1970-72," Harvard University-M.I.T. Joint Center for Urban Studies, No. 5 (September, 1975).

among regions and were cited as the major causes of differential employment growth. A more recent study by John Rees supported the earlier observations of Allanan and Birch. Using secondary data, industry surveys, and personal interviews, Rees was able to classify location decisions by manufacturing firms in the Dallas-Fort Worth area between 1967 and 1975 as follows: in situ expansions, branch plants, firm births, firm deaths, and relocations. Since the Dallas-Fort Worth area at that time was one of the more dynamic industrial growth zones in the United States, Rees expected to find that firms from the traditional manufacturing belt had expanded into the region to capture sources of supply and new markets. In fact, Rees found that locally-based firms and new firms, as opposed to external sources, accounted for most of the manufacturing growth during the 1967-1975 period.<sup>64</sup> Of the 551 new plants established between 1967 and 1975, 61 percent represented firm births, while the other 39 percent were branch plants of multiplant enterprises.<sup>65</sup> Three hundred nine plants were

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<sup>64</sup>John Rees, "Manufacturing Change, Internal Control and Government Spending in a Growth Region of United States," Industrial Movement and Change: International Experience and Public Policy, edited by F. E. I. Hamilton, (London, 1978).

<sup>65</sup>Ibid.

acquired in the area, which made the acquisition more common than branch plant decision.<sup>66</sup> Fifty-seven percent of these acquisitions were initiated by firms with headquarters in the Dallas-Fort Worth area, while 47 percent of the branch plant decisions were undertaken by firms with headquarters in the SMSA.<sup>67</sup>

The Rees and Allanan-Birch studies suggest that the primary cause of rising employment in the Sunbelt has been the expansion of existing firms and the birth of new firms. Actual migration of firms, in the sense of leaving one region of the country and reestablishing operations in another, accounted for an extremely small fraction of both employment growth and employment decline. An important implication of these findings, of course, is that economic growth in the South and West does not necessarily imply a decline in the North.

In an article by Mancur Olson entitled "The South Will Fall Again: The South as Leader and Laggard in Economic Growth,"<sup>68</sup> Olson argued that the advantage in economic growth

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<sup>66</sup>Ibid.

<sup>67</sup>Ibid.

<sup>68</sup>Mancur Olson, "The South Will Fall Again: The South as Leader and Laggard in Economic Activity," Journal of Regional Economics, 1981.

which the South has enjoyed since World War II has been because of differentials in levels of institutional cartelization and that it could not last forever. Since it now has about the same institutional arrangements as the rest of the country, it will, however slowly and gradually, probably accumulate much the same level of cartelization as the Northeast and the older Middle West.<sup>69</sup> Similarly, any differences in the economic growth rates due to wage differentials arising from other causes is rapidly being eliminated.<sup>70</sup> According to that author, the South will eventually lose its position as a leader in American economic growth.<sup>71</sup>

The confrontation of the North/South shift in employment and industrial migration has been called by a number of titles. Whether we title this activity the North/South shift, the Sunbelt/Frostbelt confrontation, or the Second War between the States, further analysis is in order. This is necessary because the conflict may prove just as dramatic and divisive as the first Civil War because it is being fought over jobs, people, income, and capital. Kevin

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<sup>69</sup>Ibid.

<sup>70</sup>Ibid.

<sup>71</sup>Ibid.

Phillip stated in "The Bulkanziation of America," that severe symptoms of decomposition have begun to appear throughout America's body politic in the economic, geographic, ethnic, religious, cultural, and biological sectors of society.<sup>72</sup> Since 1976 the process has initiated a host of political coalitions formed to do economic battle for new industry and federal dollars. For example, in 1976 the governors of seven northeastern states (Connecticut, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont) formed the Coalition of Northeastern Governors (CONEG) to establish mechanisms to reactivate and rebuild the depressed economy of the Northeast. One of CONEG's expressed aims was to present a united front before the Congress and the national administration in an effort to redress current federal expenditures imbalance. A new Congressional caucus was formed called the Northeastern-Midwestern Congressional Coalition. This unit was comprised of 204 representatives from 16 states which included the New England states, the three Mid-Atlantic states, plus Ohio, Michigan, Indiana, Wisconsin, Iowa, and Minnesota. This group's aim was to direct a higher proportion of public and

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<sup>72</sup>Kevin Phillips, "The Bulkanization of America, Business Week, (May 1976), p. 97.

private money to the northeastern states. The caucus was supported by the Northeast-Midwest Research Institute, which conducted studies designed to show that the North was short-changed in the areas of federal aid and federal procurement.

An article in Business Week titled "The Second War between the States," <sup>73</sup> stated that the traditional vigor of the industrial Midwest is being sapped by three important national trends: (1) the economic shift from manufacturing to services -- which then represented nearly two-thirds of the nation's private-sector employment -- meant that more and more companies are less shackled by geographical requirements; (2) the industrial Midwest -- like New England -- was losing a growing number of factories to the Southeast and Southwest; and (3) automation may have been taking the biggest job toll of all.<sup>74</sup>

There are several other explanations in determining the causes and reasons for regional change. In Power Shift, Kirkpatrick Sales stated that the allocation of federal funds has contributed to the growth of the South and West.<sup>75</sup>

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<sup>73</sup>Ibid., p. 98.

<sup>74</sup>Ibid.

<sup>75</sup>Kirkpatrick Sales, Power Shift, (New York, 1979).



He stated that defense expenditures were most evident and predominant. In Maureen McBreen's analysis of prime military contracts awards, she found that the South had increased its share of these awards from 11 percent to 25 percent between 1951 and 1976.<sup>76</sup> Similarly, the increase in the West was just as dramatic, increasing from 16 percent to 31 percent.<sup>77</sup> The Northeast region and the North Central region were a negative 30 percent and negative 46 percent respectively.<sup>78</sup>

Another explanation of Sunbelt prosperity and Northern decline may be found in Joseph A. Schumpeter's theory of capitalist development. In his view, the process of economic development emerges from the fiercely competitive environment of the capitalist system.<sup>79</sup> He called this competitive struggle "creative destruction."<sup>80</sup> Capitalism grows by destroying old institutions and economic structures

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<sup>76</sup>Maureen McBreen, "Economic Review," Federal Reserve Bank, Dallas, 1979.

<sup>77</sup>Ibid.

<sup>78</sup>Ibid.

<sup>79</sup>Joseph A. Schumpeter, Business Cycles, New York, McGraw Hill (1963).

<sup>80</sup>Ibid.

and creating new ones. Old firms and products are driven out of business by more efficient and innovative products.

And finally, Richard Froeschle stated that orientation to markets was a factor influencing growth and location decisions in the South.<sup>81</sup>

Another factor that may be responsible for southern and western growth over the last ten to fifteen years has been what locational theorists called the "business climate." Several recent analyses have attempted to construct an objective basis for measuring the business climate. These studies helped to illustrate the contracting views as to what constitutes a favorable environment for industrial expansion. They also provide a basis for assessing the impact of state and local tax incentives on regional economic development.

In 1975 the Fantus Company, a locational consulting firm that is a subsidiary of Dun and Bradstreet, developed a business climate ranking for all 48 contiguous states at the rest of the Illinois Manufacturers Association.<sup>82</sup> Fantus based its business climate ranking on several factors deemed

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<sup>81</sup>Richard Froeschle, "Orientation to Markets," published master's thesis, North Texas University, Denton, Texas.

<sup>82</sup>Illinois Manufacturers Association, Comparative Business Climate Study (Chicago, November, 1975).

important to firms considering alternative states as a possible location: (1) corporate income; (2) taxes as a percent of total sales state tax; (3) per capita property tax; (4) per capita welfare expenditures; (5) per capita personal income tax; (6) per capita total state taxes; (7) labor legislation; and (8) labor strikes. Based upon their study, they found the twelve best and worst states for business climates. The twelve best states were: (1) Texas, (2) Alabama, (3) Virginia, (4) South Dakota, (5) South Carolina, (6) North Carolina, (7) Florida, (8) Arkansas, (9) Indiana, (10) Utah, (11) North Dakota, and (12) Mississippi. And of course the twelve worse states were: (1) New York, (2) California, (3) Massachusetts, (4) Michigan, (5) Delaware, (6) Connecticut, (7) Pennsylvania, (8) Minnesota, (9) Oregon, (10) Washington, (11) Vermont, and (12) New Jersey.

From the preceding section, one can see that there has been considerable research on regional development and regional change. These studies have tried to illustrate the reasons and causes of growth. It is hoped that the benefit from these studies will enlighten us to new ideas and continued research on the problem of regional change. The following section will highlight some of the literature on

the analysis of regional change by observing changes in the industrial composition of the regions of the United States.

**B. Recent Trends in the Geographical  
Redistribution of Employment  
in the United States**

This section will cite three studies of the redistribution of employment in the United States. This is done to shed light on previous studies of the topic. What will be presented in an overview of industrial change and composition in the various regions of the United States. Three of the studies were done with Shift/Share analysis as the methodology which is one of the methods employed in Chapter IV of this study. The discussion will be presented in chronological order. The first will be the study done by Lowell D. Ashby for the period 1940 to 1960; the second study done by Phillip L. Rones for the study period 1968 to 1978; and the third study by John Rees for the study period 1963 to 1972.

In the article by Lowell D. Ashby,<sup>83</sup> total employment grew by twenty-one million persons or 46 percent between 1940 and 1960. In the Far West and Southwest and Rocky

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<sup>83</sup>Lowell D. Ashby, "The Georgraphic Redistribution of Employment: An Examination of the Element of Change," Survey of Current Business, 44 (1964), pp. 13-20.

Mountain States, employment doubled and increased by two-thirds, respectively.<sup>84</sup> Similarly, the increase in the two regions of New England and the Mideast, employment grew by only about one-third.<sup>85</sup> The smallest gain among the regions was that of the plains states where the increase was only one-fourth.<sup>86</sup> Only in the industrial Great Lakes area did the employment growth rate approximately equal that of the nation.<sup>87</sup>

This article also provided a rational and orderly method for sorting out the factors which relate to the differences in the rates of growth among regions. The principal standard of reference was the growth rate of the nation as a whole, both in total employment and in employment within the various industries. There was no attempt in this article to explain the causes for the rate of employment growth in the nation or in the several regions. Ashby analyzed the growth of the regions by observing changes in two of the three components of Shift/Share analysis: the industrial mix and the regional share component. Regarding the first compo-

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<sup>84</sup>Ibid.

<sup>85</sup>Ibid.

<sup>86</sup>Ibid.

<sup>87</sup>Ibid., p. 17.

ment, the rate of growth of a particular industry nationally is characterized as rapid or slow in terms of the growth rate of all national industries combined over the same period. As for the second component, the rate of growth of a region within a particular industry may be rapid or slow in terms of the growth rate of that industry nationally.

In Ashby's analysis, he found that the industrial mix and regional share components tend generally to pull in opposite directions. For example, in New England, the Mideast, and the Great Lakes regions, a favorable industrial mix tended to boost employment in each of the two decades under study. Conversely, all three regions sustained preponderant losses in their share of the several industries.<sup>88</sup> In the two southern regions and in the Rocky Mountain states, an opposite situation occurred. Here an unfavorable industrial mix -- mainly the effect of heavy dependence upon agriculture -- tended to suppress employment growth, but within the individual industries, these regions enjoyed an increasing share of the national totals.<sup>89</sup>

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<sup>88</sup>Ibid.

<sup>89</sup>Ibid.

In the plains states, both the industrial mix and the regional share components of the individual industries subtracted from employment gains; in contrast, both factors contributed to the rapid expansion of employment in the Far West.<sup>90</sup> In the analysis, there were nineteen states with positive industrial-mix components.<sup>91</sup> These states were concentrated in a tightly compacted group in the New England, Mideast and Great Lakes regions.<sup>92</sup> In 1950, there were again nineteen states with positive industrial-mix components.<sup>93</sup> Therefore, the same states showing industrial mix gains in the 1940's also showed these signs in the 1950's. For the table of each region showing the components of change, see Ashby. Ashby stated that under the surface appearance, the relative strength of this favorable industrial composition was being weakened.<sup>94</sup> From the 1940's to the 1950's, industrial mix components declined in size relative to regional share components because of the increasing structures of the various areas. The reason

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<sup>90</sup>Ibid.

<sup>91</sup>Ibid.

<sup>92</sup>Ibid.

<sup>93</sup>Ibid.

<sup>94</sup>Ibid.

Ashby gave for this was the continuing migration of stream from rural (agricultural and other resource-based industries) to urban areas.<sup>95</sup> This meant that the positions of the states formerly most favored by industrial composition (in employment growth terms) were often undergoing an adverse adjustment while those formerly least favored are undergoing a favorable adjustment. Thus when people left agricultural employment in a southern state, that state's industrial structure became more like that of the nation. The uniqueness which made for an unfavorable industry mix has been decreased.

Ashby showed the increasing industrial similarity of the major regions by using two simple indexes. One is similar to the coefficient of specialization. The first was an index for each industry of its regional centralization. From the indexes, he concluded that most industries were becoming more dispersed geographically.<sup>96</sup>

The regional index of industrial specialization provided another way of looking at the process of the homogenization of the industrial-regional structure. In all eight regions that were under study for the study period 1940 to 1960,

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<sup>95</sup>Ibid., p. 18.

<sup>96</sup>Ibid.



specialization declined.<sup>97</sup> The largest decline at this time occurred in the Southeast, the smallest in the Great Lakes region.<sup>98</sup> During this period the Southeast has been relatively susceptible to structural change, with massive out-migration from agriculture and some in-migration into other industrial pursuits.<sup>99</sup> The Great Lakes, on the other hand, started with an already matured industrial complex which has remained relatively unchanged when measured against the industrial structure of the whole nation. Texas had an unfavorable industrial mix in both the 1940's and the 1960's, but Texas's industrial mix position was improved by 91.7 thousand in the 1950's as compared with the 1940's.<sup>100</sup> Conversely, the state of Michigan, although favored by its industrial mix in both periods, experienced a worsening of its position to the extent of 139.2 thousand.<sup>101</sup>

Now, the regional share component and its implication for this time period will be presented. There were thirty states with positive share components in the 1940's and only

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<sup>97</sup>Ibid.

<sup>98</sup>Ibid.

<sup>99</sup>Ibid.

<sup>100</sup>Ibid.

<sup>101</sup>Ibid., p. 19.

twenty-three in the 1950's. In the 1940's most of these states were in the Southeast, Southwest, Rocky Mountains and the Far West.<sup>102</sup> In the 1950's to 1960's these states with positive share component were similarly in these same four regions.<sup>103</sup> The state with the largest change in its share between 1940 and 1960 was California in which the largest industrial displacements contributing to the improved industrial share position were electrical and other machinery manufacturing industries.<sup>104</sup> At the other end of the spectrum, Pennsylvania was the largest loser by some 216 thousand persons, and the same two industrial categories above were the largest contributors to its move in a negative regional share direction.<sup>105</sup> The five states with the largest regional shares were California, Florida, Arizona, Hawaii, and New Jersey. In Florida, Arizona, and Hawaii, the particular industries that increased its share the most were retail trade, contract construction, machinery and electrical machinery.<sup>106</sup>

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<sup>102</sup>Ibid.

<sup>103</sup>Ibid.

<sup>104</sup>Ibid.

<sup>105</sup>Ibid.

<sup>106</sup>Ibid.

There are many factors underlying the changes in the regional share of an industry's employment. A change in competitive position is often very important. The competitive position may be related to a region's access to markets on the selling side and its access to raw materials, labor, and other inputs on the buying side. During this study, the states of the Southeast and Southwestern regions appeared to have an edge. These states increased their portion of the positive regional-share components in the 1950's as compared to the 1940's. In fact, the set regional-share component total for the thirteen states (California, Arizona, New Mexico, Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South and North Carolina, Virginia, and Maryland) accounted for 74.5 percent of the total in the 1940's and 89.7 percent in the 1950's.<sup>107</sup> It was stated that this was the result of the so-called "foot loose" industry as opposed to "resource" or "market" oriented industries.<sup>108</sup>

In Phillip L. Rones's<sup>109</sup> study for the period 1968 to 1978, his purpose was to use data from the Current Popula-

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<sup>107</sup>Ibid.

<sup>108</sup>Ibid.

<sup>109</sup>Phillip Rones, "Moving to the Sunbelt: Regional Job Growth, 1968-1978," Monthly Labor Review, 1979.

tion Survey (CPS) to demonstrate both the change in the industrial makeup of the national economy and the regional patterns of industrial growth and decline. The second objective was to examine the factors which had led to the industrial expansion of both the South and the West, and the relative decline in the North. In his analysis, the big losers during this study period were agriculture, where almost half a million jobs were lost, and manufacturing, which added only 700,000 during a period when employment grew by almost 20 million.<sup>110</sup> Industries with the fastest rates of growth were all outside of the goods-producing sector. Services experienced by far the most impressive rate of growth -- from 12 percent of total employment to .15 percent.<sup>111</sup> Manufacturing experienced a decline of four percentage points.<sup>112</sup> Wholesale and retail trade, finance, insurance, and real estate all posted relative employment gains.<sup>113</sup>

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<sup>110</sup>Ibid.

<sup>111</sup>Ibid.

<sup>112</sup>Ibid.

<sup>113</sup>Ibid.

In terms of regional movement, all regions experienced absolute employment gains over the decade. But the Northeast region experienced a large decline in its share of total employment, from 25 percent to 22 percent, reflecting relative reductions in virtually all of the major industry groups.<sup>114</sup> The North Central region also experienced relative job losses; the South and West posted strong gains in overall employment as well as in most industries.<sup>115</sup>

In the two regions where the employment share fell, the largest loss occurred in areas most dependent on manufacturing -- the Middle Atlantic and the East North Central divisions. Employment in New England, which was only about a fourth of the Northeast total, also declined relative to the rest of the nation, but at a much slower rate than in the Middle Atlantic division.<sup>116</sup>

The West exhibited an employment gain for the study period. Most of the employment gains were in the mountain states, which was almost twice those of the Pacific states.<sup>117</sup> In the South, the big gainer was of course the West South

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<sup>114</sup>Ibid.

<sup>115</sup>Ibid., p. 13.

<sup>116</sup>Ibid.

<sup>117</sup>Ibid.

Central division, which includes Texas, Oklahoma, Arkansas, and Louisiana.<sup>118</sup>

In an analysis of the growth factors using shift/share analysis, nationwide manufacturing employment grew by less than 700,000 from 1968 to 1978.<sup>119</sup> Had manufacturing employment grown at the same rate as all other private, nonagriculture, wage and salary employment during that period, the gain would have been almost five million.<sup>120</sup> Although factory employment increased in the South and West by more than 900,000 and 300,000 respectively, it declined in the Northeast by almost 800,000.

One important difference among the four regions was the nature of manufacturing employment. The West had twice as many workers in durable goods as it had in nondurable goods industries; durable goods had a 70 percent employment edge in the North Central region.<sup>121</sup> The South, conversely, had slightly more workers in nondurable goods industries.<sup>122</sup>

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<sup>118</sup>Ibid., p. 14.

<sup>119</sup>Ibid.

<sup>120</sup>Ibid.

<sup>121</sup>Ibid.

<sup>122</sup>Ibid.

For the wage structure, there were some important, noticeable differences. The data indicated that although 34 percent of factory employment in the South in 1978 was in industries with hourly earnings below the national average for all production workers on nonfarm payrolls (\$5.69), only 21 percent of the factory workers in the rest of the nation were in those industries.<sup>123</sup> Correspondingly, 51 percent of manufacturing employees nationwide were in industries with average wages above \$6.50 an hour, but only 32 percent of those in the South were so employed.<sup>124</sup> In durable goods, the South had the smallest percentage of industry employment in those industries which have the highest average hourly wage -- primary metals, transportation equipment, machinery, and fabricated metals.<sup>125</sup> Those durable goods industries with high employment concentrations in the South -- lumber and furniture, for example -- are relatively low paying industries.<sup>126</sup> However, the South was well represented in several high-paying, nondurable goods industries, the

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<sup>123</sup>Ibid.

<sup>124</sup>Ibid.

<sup>125</sup>Ibid.

<sup>126</sup>Ibid.

chemical industry and relatively small petroleum industries.<sup>127</sup>

Once again, the author stated that the growth of the South was due to business climate, and he quoted the Fantus study.<sup>128</sup> Similarly, he concurred with the studies by C. L. Jusenius and L. C. Ledebur<sup>129</sup> and John Rees<sup>130</sup> that the movement of firms from the industrial North to the Sunbelt has been less important to regional employment growth. The creation of new firms and the expansion of existing firms tended to be the dominant cause of employment growth.<sup>131</sup>

John Rees<sup>132</sup> used shift/share analysis to test two hypotheses that are similar to this study hypothesis. The study period was from 1963 to 1972. The two hypotheses were to show the decentralization of standardized production

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<sup>127</sup>Ibid.

<sup>128</sup>Ibid.

<sup>129</sup>C. L. Jusenius and L. C. Ledbur, A Myth in the Making: Southern Economic Challenge and Northern Economic Decline, U.S. Department of Commerce (1976).

<sup>130</sup>John Rees, Regional Industrial Shifts in U. S. and the Internal Generation of Manufacturing in Growth Centers of the Southwest, in Interregional Movement and Regional Growth by William C. Wheaton, Urban Institute (1979).

<sup>131</sup>Ibid.

<sup>132</sup>Ibid.



technology from the manufacturing belt to the states of the Southeast and Southwest had increased, and secondly to show that the growth industries (which were in high-tech industries) had become more prevalent in the peripheral regions of the Southeast and Southwest, and less prevalent in the traditional manufacturing areas of the Northeast and Midwest.

Rees's study was similar to the study H. S. Perloff and L. Wingo<sup>133</sup> had done between the period of 1939 to 1954. In the Perloff and Wingo study, and with the employment of shift/share analysis, they concluded that the rapid growth in manufacturing industries had continued to find their most favorable location in the industrial heartland. The study showed positive mix effects for most of the states of the Manufacturing Belt in contrast to the negative mix effects of the peripheral states of the South Atlantic, East South Central, and West South Central regions.<sup>134</sup> During this time period, the Northeast was still the Manufacturing Belt and the industrial seed-bed of the nation. The competitive

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<sup>133</sup>H. S. Perloff and L. Wingo, "Natural Resource Endowment and Regional Economic Growth," in J. J. Spengler, ed., Natural Resource and Economic Growth (Washington, D.C., 1961).

<sup>134</sup>Ibid.

components, however, did portray more positive gains in the periphery and negative effects in the Belt.<sup>135</sup> They concluded that the Manufacturing Belt was starting to lose out to the rest of the country over the 1939 to 1954 period, a trend that has continued ever since.

Turning to the shift/share analysis of the 1963 to 1972 period that Rees conducted using recent census data at the two-digit level, some interesting changes were evident. Negative competitive effects were seen for the Manufacturing Belt, but in larger quantities than in the Perloff and Wingo study.<sup>136</sup> Larger positive competitive gains were seen in the peripheral states, particularly the South Atlantic, East South Central, and West South Central census regions.<sup>137</sup>

The industrial mix effects over the 1963 to 1972 period were also significant. Some changes in this component were also evident from the Perloff and Wingo study. The Manufacturing Belt as a whole still showed positive mix effects; it has the largest share of nationally growing industries.<sup>138</sup> But the small negative mix effects in the peripheral census

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<sup>135</sup>Ibid.

<sup>136</sup>Rees, op. cit., p. 62.

<sup>137</sup>Ibid.

<sup>138</sup>Ibid.

regions suggested that the 1960's may have been a time of transition. The major competitive gains in the peripheral regions meant that in the near future a greater proportion of growth industries would appear there. The most competitive loss in the Manufacturing Belt to the newer regions of the South and West, together with the relative decline in importance of mix effects compared to competitive effects since Perloff and Wingo's study, was evidence of the erosion of the Manufacturing Belt's industrial prowess.<sup>139</sup>

Shift/share analysis of the period 1972 to 1976, using most recent data from the Annual Survey of Manufacturers, also indicated that the trend in the competitive component was the same as for the previous time period, a continuing loss in the Manufacturing Belt and gains in the peripheral states.<sup>140</sup> However, key important reversals in the mix effect by value added were found in certain census regions. The Manufacturing Belt as a whole showed a negative mix effect, implying that the region had lost its earlier prowess in terms of growth industries.<sup>141</sup> Positive mix effects for value added were seen in the region most adjacent to the Manufac-

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<sup>139</sup>Ibid., p. 63.

<sup>140</sup>Ibid.

<sup>141</sup>Ibid.

turing Belt, the West North Central region.<sup>142</sup> More important was the large positive mix in value added seen in the West South Central region.<sup>143</sup> This included the state of Texas, one of the Sunbelt's key growth areas.

**CHAPTER III**  
**THE METHODOLOGY OF THE STUDY**

**A. Introduction**

This chapter will explain two methodologies employed in the following analysis of regional change. One of those methods has already been discussed on the surface in the preceding chapter. The two methods of procedure are shift/share analysis and economic base analysis.

For clarity purpose, the areas to be analyzed in this study are those designated by the Census Department and include all nine regions of the United States. [See Appendix A.] The time period involved is that of 1970 to 1980 and 1981 to 1985. These time periods were used to get a twenty-year picture of the changing United States regional change.

**B. The Method of Shift/Share**

Shift/share analysis is a method by which employment can be divided into three components. These three components are: (1) national share, (2) industrial mix, and (3) regional or local share [Appendix B]. The national share measures the change in employment and assumes that the expected change for an industry in a region duplicates the

experience of that industry in the nation. The industrial mix component identifies that portion of economic change that is due to a region's share of fast and slow growing industrial groups. And the regional share or local component is the change that is due to regional industries growing at rates different from their national counterparts.

Shift/share analysis first appeared in Regions, Resources and Growth by Perloff, Dunn, Lampard, and Muth.<sup>1</sup> Shift/share was introduced as a descriptive device and a technique for examining systematically regional economic growth and employment data. The shift/share model used by Perloff concentrated on total regional employment and had two components: (1) total shift for the nation (TS) and (2) the differential shift for the region (DS). It is of interest that Dunn focused on total employment shift and introduced differential rates of growth in individual industries (his proportionality effect, which equalled the industrial mix) only to obtain an accurate measure of total differential regional shift.<sup>2</sup> The analysis for this time

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<sup>1</sup>Perloff, H.; Dunn, E. S.; Lampard, E. E.; and Muth, J. F., Regions, Resources and Economic Growth, 1960.

<sup>2</sup>E. S. Dunn, Jr., "A Statistical and Analytical Technique for Regional Science," Papers, Regional Science Association, 6(1960), pp. 97-112.

period appeared to concentrate on overall regional economic performance rather than on the relative growth or decline of individual industries and the conclusions which might be drawn therefrom about changes in regional comparative advantage for particular sectors. This was a form of export analysis.<sup>3</sup>

Shift/share has been used by several regional and labor economists in previous studies. Ashby expanded the two models by Perloff and added a third component.<sup>4</sup> He made the three model explicit and turned his attention to regional shifts in industrial industries. In criticism of Ashby's work, David B. Houston objected to what he called the implicit normative assumption that an industry in the region should grow at the same rate as the nation as a whole.<sup>5</sup> He asserted that shift/share should be called a measurement tool rather than an analytical technique, while at the same time criticized it for not being a behavioral growth model and not being able to forecast growth accurately.<sup>6</sup> In a reply to Houston, Ashby replied that

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<sup>3</sup>Ibid.

<sup>4</sup>Ashby, "Geographic Redistribution," p. 16.

<sup>5</sup>David B. Houston, "The Shift Share Analysis of Regional Growth: A Critique," Southern Economic Journal, 33, (1967), pp. 579-581.

<sup>6</sup>Ibid., p. 577.

shift/share was never meant to be a model of growth and hence was not meant to provide forecast.<sup>7</sup> The analysis that will be presented below is likewise used only as a measure of growth and not as a projection model, although it has been tagged as such as model in other studies. Ashby supported the usefulness of shift/share as being an aid to the regional economist who also has other qualitative data which can be related to changes in economic activity, and suggested that regional analysis is an art which takes experience and insight.<sup>8</sup> It has its application as a descriptive technique.<sup>9</sup>

The following paragraphs of this section will be a presentation of articles written on shift/share analysis as a projection model and also a presentation of studies done on the stability of the regional share component. Finally the criticisms and benefits of shift/share will be presented.

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<sup>7</sup>Ashby, "The Shift Share Analysis: A Reply," Southern Economic Journal, 34 (1968), pp. 423-425.

<sup>8</sup>Ibid., p. 424.

<sup>9</sup>Ibid.



An article by H. James Brown<sup>10</sup> presented one of the first empirical tests of shift/share and the descriptive content of the components. The goal of that study was to test the projection capabilities of the method. Similarly shift/share was compared with alternative models. Thirdly, an evaluation of the critical competitive or regional share component was presented to discover how reliable this component was in the study. The projection of shift/share was compared to those of a model that projected each regional industry at that industry's national growth rate over the previous period. This model was called the ingrow model. The second model was one that projected each regional industry at the national industry's projected growth, and it was called the super-ingrow model. For each of the models the predicted percent change in employment was compared with actual percentage change. These tests were conducted by looking at 2, 3, and 4 S.I.C. categories. The data were from the Census of Manufacturers and County Data from the U. S. Department of Commerce. The measures used to

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<sup>10</sup>H. Jones Brown, "Shift-Share Projections of Regional Economic Growth, An Empirical Test," Journal of Regional Science, vol. 9 no. 1 (1969), pp. 1-8.

evaluate the relative merit of the project models were those used by Theil.<sup>11</sup>

The first measure that he used was called the inequality coefficient, defined as the square root of the mean error (MSE) of the prediction  $(1/n) \sum_i (P_i - A_i)$  divided by the mean error of actual values  $(1/n) \sum_i (A_i)$ . This yielded the inequality coefficient  $U = \left[ \sum_i (P_i - A_i)^2 / \sum_i (A_i)^2 \right]^{1/2}$  where  $P_i$  equaled the predicted employment change in the  $i^{\text{th}}$  industry and  $A_i$  equaled the actual employment change in the  $i^{\text{th}}$  industry, and  $n$  equaled the number of industries. The decomposition was as follows:<sup>12</sup>

$$(1/n) \sum_r (P_i - A_i) = (\bar{P} - \bar{A}) + (S_p - S_a) + 2(1 - r) S_p S_a$$

where  $\bar{P} = \sum_r P_i / n$

$$\bar{A} = \sum_r A_i / n$$

$$S_p = (1/n) \sum_i (P_i - \bar{P})^2$$

$$S_a = (1/n) \sum_r (A_r - \bar{A})^2$$

and  $r = (1/n) \sum_r (P_i - \bar{P})(A_i - \bar{A}) / S_p S_a$ .

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<sup>11</sup>Ibid., p. 7.

<sup>12</sup>Ibid.

The conclusion of the analysis is that Brown proved that the ingrow model gave a more precise projection than shift/share.<sup>13</sup> The inequality coefficient was smaller in each case. The data gave no doubt that for predicting the percentage growth in manufacturing employment, the simple extrapolation of every regional industry at the historical national industry growth rate gave better results than the best formulation of the shift/share model.<sup>14</sup> One of Brown's criticisms of the shift/share model is that the model needed exogenous projections of the national industry growth.<sup>15</sup> When the shift/share model was compared to the super-ingrow, the super-ingrow gave more precise projections.<sup>16</sup>

Since the shift/share model had a larger inequality coefficient than either of the two other models, Brown questioned the stability of the competitive component or the regional share component. He stated that the competitive component did not appear to be very stable.<sup>17</sup> Brown tested the stability of the competitive component by using a 2x2

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<sup>13</sup>Ibid.

<sup>14</sup>Ibid.

<sup>15</sup>Ibid., p. 15.

<sup>16</sup>Ibid., p. 9.

<sup>17</sup>Ibid., p. 10.

contingency table on the basis of the sign of the component in the succeeding periods.<sup>18</sup> Thus he used the chi-square distribution to test for independence of the sign of the component over time. His data gave a strong indication that the sign of the competitive component in any one period was independent of the sign of the competitive component in the preceding period.<sup>19</sup> His conclusion also stated that the classification of a region's industries according to the value of the competitive component provides little if any useful information about its performance in later periods.<sup>20</sup> He stated that the competitive component changes so fast that to assume them constant is not a good approximation.<sup>21</sup>

Brown concluded that his test indicated that shift/share was not a useful framework for regional projections.<sup>22</sup> What made the findings, stated Brown, is that it results from the fact the difference between the rate of growth of a national industry and the rate of growth of a regional industry, the competitive component, is not stable; it's not a way of

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<sup>18</sup>Ibid.

<sup>19</sup>Ibid., p. 11.

<sup>20</sup>Ibid.

<sup>21</sup>Ibid., p. 13.

<sup>22</sup>Ibid.

classifying a region over time; and that it's not usually associated with the other forces that have determined a region's competitive position.<sup>23</sup>

Brown goes on to explain the poor performance of the competitive component by stating that it was an identity which was formed by adding and subtracting growth rates.<sup>24</sup> Secondly, it was too broad. The economic behavior underlying different values of the competitive component was not distinguishable.<sup>25</sup> And thirdly, it used national employment as the basis for calculations.<sup>26</sup>

In defense of the competitive component, three authors by the names of Christos C. Paraskenopoulos, Charles F. Floyd, and C. F. Simons wrote articles showing that shift/share was an applicable methodology and that the competitive component was in fact stable.

In the article by Paraskenopoulos,<sup>27</sup> he was coming to the

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<sup>23</sup>Ibid., p. 14.

<sup>24</sup>Ibid., p. 15.

<sup>25</sup>Ibid.

<sup>26</sup>Ibid.

<sup>27</sup>Christos C. Parakenopoulos, "The Stability of the Regional-Share Component: An Empirical Test," Journal of Regional Science., vol. 11, no. 2 (April, 1971), pp. 107-112.

defense of the regional share component. This article, written in response to Brown's article that the regional share (competitive) component is unstable over time. He quoted Brown as saying:<sup>28</sup>

The instability of the competitive (regional share) component is a serious problem not only to the use of SIS as a projection model, but also to its use as a planning and policy tool. It is clear that if the component is unstable and changes without pattern, policy decisions made on the basis of the historical component probably will not be relevant to succeeding periods.

In order to demonstrate this instability, Brown made use of a 2x2 contingency table on the basis of the sign of the regional share in succeeding periods, i.e.:

		Second Period	
		+	-
+			
First Period			
-			

Thus, he can use the chi-square distribution to test for independence of the sign of the component over time. To this end he stated:

(1) If the test result is not significant, it could be interpreted as saying that the data are consistent with the hypothesis that the sign of the component in the second period is independent of the sign of the component in the first period.<sup>29</sup>

<sup>28</sup>Ibid.

<sup>29</sup>Brown, op. cit., p. 9.

To test this hypothesis, Brown uses data from Census of Manufacturers and shows that in six out of seven cases, the test results were not significant. On this basis he concluded that the data give a very strong indication that the sign of the competitive component in any one period is independent of the sign of the competitive component in the succeeding period.<sup>30</sup> He further reported that a sampling of the county data from the U. S. Department of Congress gave the same results.<sup>31</sup>

Paraskenopoulos challenged Brown's results on the following grounds:

- (1) His sample was small and apparently not representative, to support the generalization reached. The non-random nature and the restrictive size of the sample are the most damaging to the validity of Brown's analysis and not to S/S method, as Brown asserts in his article; and
- (2) The assertion that a sampling of the county data from the U. S. Department of Commerce gave identical results seems to be in contradiction with the data from the same source not for a sampling but for the entire U. S. The empirical evidence that is reported below leads to conclusions contrary to those reached by Brown.

Paraskenopoulos conducted an empirical test for the competitive component by using Ashby [employment figures he used in his article] for thirty-two industries by region,

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<sup>30</sup>Ibid.

<sup>31</sup>Ibid., p. 10.

states, and counties. On this basis he constructed a 2x2 contingency table and proceeded in testing the stability of the regional share component over time.

TABLE I  
EMPLOYMENT CHANGES RELATED TO IM AND  
PERCENTAGE SHIFT BY REGION

Region	Thousands of Employees		Percentage Shift	Percentage Shift
	1940-1950 (1)	1059-1960 (2)	1940-1950 (3)	1950-1960
Northeast	225.2	198.2	12.04	12.80
Mideast	821.6	758.4	43.93	48.97
Great Lakes	567.1	277.1	27.12	17.89
Plains	- 316.6	- 320.9	-16.93	-20.72
Southeast	-1,249.7	-1,062.4	-69.50	-68.60
Southwest	220.7	- 100.8	-11.80	- 6.51
Rocky Mts.	33.1	- 64.6	- 1.77	- 4.17
Far West	316.2	315.0	16.91	20.34
TOTAL	1,870.1	1,548.7	1.0	.00

a) Col. 1 is 9% of total (1870.1)

b) Col. 2 is 9% of total (1548.7)

c) The sum of absolute values of each column divided by 2.

Tables I and II provided the relative employment changes due to industrial mix and regional share by regions. The percentages of upward and downward shifts are reported in the last two columns. An inspection of Tables I and II shows that both components are consistent in terms of sign over time. The regions that were gaining in IM in the first



period, 1940-1950, continued to do so in the second period, 1950-1960, and vice versa.

TABLE II  
EMPLOYMENT CHANGES RELATED TO REGIONAL SHARE  
AND PERCENTAGE SHIFTS BY REGION

Region	Thousands of Employees		Percentage Shift	
	1940-1950 (1)	1059-1960 (2)	1940-1950 (3)	1950-1960
Northeast	- 440.1	- 288.2	-22.04	-11.78
Mideast	-1234.6	-1298.3	-61.82	-53.08
Great Lake-	- 300.8	- 652.1	-15.06	-26.66
Plains	- 21.5	- 207.4	1.08	- 8.48
Southeast	700.8	718.8	35.09	29.39
Southwest	401.4	431.5	20.10	17.64
Rocky Mts.	120.0	163.1	6.01	6.67
Far West	774.9	1132.6	38.80	46.30
TOTAL	1997.0	2446.0	100.00	100.00

- a) Col. 1 is 9% of total (1870.)  
 b) Col. 2 is 9% of total (1548.7)  
 c) The sum of absolute values of each column divided by 2.

In Table II the same results emerge for the regional share components. Thus the sign of components remained unchanged over time.

Table II illustrated similar results by looking at states for the study periods 1940-1950 and 1950-1960. In

regard to IM, only six signs changed out of fifty-one. In regard to RS, a 2x2 contingency table was constructed.

The value of computed chi square ( $\chi^2$ ) statistic is 8.351. With one degree of freedom, the chi square tables show that  $\Pr(3.841 < \chi^2) = .05$ . The test results are significant and the data do not support the hypothesis that the signs of the regional share component are independent over time. Finally a correlation test was performed which gave identical results. The values of the estimated correlation coefficients for IM and RS components were +0.96 and 0.90 respectively. They are statistically significant as the one percentage level. This alternative test rejects, again, the hypothesis of independence of both employment components over time.

Parakenopoulos concluded from this study that, in short, Brown's empirical test is misleading and confusing.<sup>32</sup> The empirical evidence presented demonstrates that shift/share method still remains a useful tool for regional economic analysis.<sup>33</sup> The consistency of the RS component over time is

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<sup>32</sup>Ibid.

<sup>33</sup>Parakenopoulos, p. 109.

perhaps one of the most important strengths of the shift/share method.<sup>34</sup>

Brown's reply to Paraskenopoulos points out, correctly, that Paraskenopoulos's calculations are based on total employment in regions, not for individual industries. He contends that it is well known that overall regional employment shift tends to be relatively stable because regional growth and decline are long-term trends. But he notes that this still does not deal with the question of whether individual industries, where employment shift/share analysis now seeks to forecast, have stable shift components.<sup>35</sup>

In a joint effort by Floyd and Simons, the purpose of their study was to examine Brown's argument using more representative and complete data, to test the stability of regional share component. Floyd and Simons commented that shift/share does need modification, but Brown's comment on the condemnation of the method is not justified.<sup>36</sup>

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<sup>34</sup>Ibid., p. 111.

<sup>35</sup>Ibid.

<sup>36</sup>Charles F. Floyd and C. F. Simons, "Shift Share Projections Revisited," Journal of Regional Science, vol. 13, no. 1 (April, 1973), pp. 115-120.

In their article, Floyd and Simons projected 1967 employment at the various levels of geographic disaggregation based upon 1950-1959 growth rates, using each of the four models (SI, IG, S/S, RR conversion assumption). The projections were then compared to actual 1967 employment utilizing Theil's inequality coefficient. The same tests were conducted for manufacturing and nonmanufacturing states to determine the effect of industrial desegregation on the accuracy of the projections. Similar measures were calculated for each of the twenty-nine industries individually at the state rate.

The results of the study concerning the inequality coefficient demonstrated that the shift/share model was superior to the regional rate model. Also in their study, they found, contrary to Brown's findings, that shift/share model was superior to IG model. The results indicated, however, that regional employment projections utilizing only expected national industry growth rates (SI) are somewhat more accurate than those that add a regional industry correction factor based on a simple extrapolation of historical regional shares.

At the state level of geographical desegregation, the SI model is superior for seven of eight regions, thirty-one of forty-eight states, and for the forty-eight states, twenty-

seven states, and twenty-one state totals. The SI model was also superior for all cases tested at the manufacturing and nonmanufacturing industry level aggregations, although shift/share model projected employment more accurately for twenty of twenty-nine individual industries.

On the stability of the regional share component, the results showed the significant computed value of chi-square in seventeen of twenty-three cases when testing for the interdependence of the sign of the share component. The RS component was stable over time.

Floyd and Simons commented that the RS component is a useful tool for isolating the factors that cause industries to grow at differing rates in various regions. Because of the interrelationship of the factory changes over time, simple extrapolation of the RS component into the future is not a satisfactory assumption in the shift/share projection model and requires modification. The authors tested one modification based on the fact that regional growth rates are tending to converge to national rates (convergence assumption). The method improved the projection accuracy of shift/share model. It was superior to twenty-four of the forty-eight states, compared to only seventeen states for the original shift/share model.

TABLE III  
INEQUALITY COEFFICIENTS FOR COMPARISONS OF MODELS

Area	State Level Desegregation			
	S/S	R/R	I/G	SIG
48 State Total	.111	.218	.112	.086*
(a) 18 Mfg.	.285	.636	.183	.169*
(b) 11 Non-Mfg.	.080	.127	.103	.074*
27 State Total <sup>(a)</sup>	.092	.204	.108	.082*
(a) 18 Mfg.	.214	.667	.168*	.170
(b) 11 Non-Mfg.	.075	.106	.102	.071*
27 State SMSA	.167	.512	.106	.091*
(a) 18 Mfg.	.252	.570	.181*	.190
(b) 11 Non-Mfg.	.158	.507	.098	.078*
27 State Non-SMSA	.518	2.522	.306	.302*
(a) 18 Mfg.	.435	.702	.345	.324*
(b) 11 Non-Mfg.	.525	.411	.302	.300*
21 State Total <sup>(b)</sup>	.192	.291	.132	.108*
(a) 18 Mfg.	.425	.539	.220	.167*
(b) 11 Non-Mfg.	.107	.220	.110	.094*
Regions <sup>(c)</sup>				
Northeast	.105	.224	.105	.085*
Mideast	.079*	.110	.077	.085
Great Lakes	.149	.132	.072	.047*
Plains	.138	.348	.087*	.098
Southeast	.143	.427	.179	.142*
Southwest	.091	.233	.103	.052*
Rocky Mts.	.111	.568	.138	.011*
Far West	.104	.235	.148	.088*

\* Asterisk indicates the Super Model for each case.

(a) The 27 states are: Alabama, California, Delaware, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Montana, Nebraska, Nevada, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina [sic], South Dakota, Tennessee, Texas, Virginia, Washington, and West Virginia.

(b) The 21 states are: Arizona, Arkansas, Colorado, Connecticut, Georgia, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Mexico, North Carolina, Oklahoma, Rhode Island, South Carolina [sic], Utah, Vermont, Wyoming.

(c) Regions are those designated by BEA, U. S. Department of Commerce.

The authors reached the conclusion that the regional share component is stable over time. There is enough instability in the share component, however, to make shift/share projection model based upon a simple extrapolation of the components somewhat inferior to a model (SIG) that utilizes national projected industry growth rates and omits any form of regional industry growth rate adjustment. But that does not mean that shift/share as a technique lacks a future as a projection tool, but rather the assumption about absolute stability in the RS component over time is not valid. The CA should be employed with shift/share analysis as a modification.

Stevens and Moore stated in their article<sup>37</sup> that the methodology of shift/share and its application continued to grow in popularity as a forecasting tool. This persistence is due to two facts:

(1) Technique is simple and relies on easily accessible, published data, making it fast and reasonably accurate, given its cost.

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<sup>37</sup>Benjamin H. Stevens and Craig L. Moore, "A Critical Review of the Literature on Shift/Share as a Forecasting Technique," Journal Regional Science, vol. 20, no. 4 (November 1980), pp. 419-437.

(2) Because shift/share has not yet been subjected to the kinds of critical empirical tests which would raise serious doubts in the minds of practitioners about the accuracy of forecasts made with this technique. This is because the literature has not concentrated on the absolute predictive performance of shift/share, but has almost exclusively dealt with the relative performance of alternative forecasting forms of this approach.

The purpose of the above authors' work was to (1) clarify the basic issues and untangle the strands of algebraic notation; (2) make specific criticisms of selected recent articles which serve to illustrate the fundamental theoretical and empirical weakness of shift/share models, especially in their use as forecasting tools; (3) discuss alternative and more promising uses of shift/share as an element in more accurate methods of forecasting.

The emphasis in the paper had been on the comparative evaluation of various formulations of shift/share in their use as regional employment forecasting techniques. This evaluation suggested that some shift/share models may be better than others for forecasting purposes. But it also suggests that none of the models investigated may be



sufficiently accurate and dependable for policy and planning purposes.

Shift/share still seems to have some value in serving its original purpose of making expert analyses of the components of regional employment change. Shift/share is unrivaled in its ability to provide quick, inexpensive, and useful indications of past regional performance and to identify problems which may deserve the attention of public policy makers or may require further study.

### C. Introduction to Economic Base Theory and Method

The heart of economic base theory is the proposition that the rate and direction of growth of a region or a city is determined by its function as an exporter to the rest of the world.<sup>38</sup> Several economists have stressed the role of exports in regional economic development. In its simplest form, export base theory states that the regional growth rate is a function of exogenous demand.

This ability to export induces a flow of income into the region, which, through the familiar multiplier effect, tends to expand the internal markets of the region for both national and region-serving goods and services. . . . As the regional market

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<sup>38</sup>Avrom Ben-David, Regional Economic Analysis, Chapter 6, p. 103.

expands and regional activities proliferate, conditions may develop for self-reinforcing and self-sustaining regional growth, and new internal factors may become important in determining the rates of regional growth, such as external economies associated with social overhead capital and the agglomeration of industries, and internal economies of scale.<sup>39</sup>

The resource endowments of a particular region determine its competitive advantage in the national economy. Resource endowments include services and amenities as well as natural resources, and over time a region's endowments may be modified through technological change, economic reorganization, importation of capital, or changes in the quantity and quality of the labor force. Weinstein stated<sup>40</sup> that export-producing industries are critical to regional growth for three reasons: (1) they attract income from other regions, bringing about a type of balance of payments surplus; (2) export industries tend to be technologically advanced and to operate at high levels of productivity; (3) export industries generally have strong forward and backward linkages with other regions and industries, and this helps to integrate the developing region into the national economy;

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<sup>39</sup>Ibid.

<sup>40</sup>Bernard L. Weinstein and Robert Firestone, Regional Growth in the United States, (New York, 1978).

and (4) an export sector permits a region to shift part of its tax burden to residents of other areas.<sup>41</sup>

Historically, the development of most regions in the United States can be explained in terms of an export base. In pre-industrial America, the South specialized in export agricultural commodities, while the North engaged in light manufacturing and financial services.<sup>42</sup> Between 1870 and 1950, the Northeast and Midwest manufacturing belt achieved rapid economic development by producing and exporting finished goods to all other regions of the nation.

The recent development of the Sunbelt and Mountain States can also be viewed with reference to export base theory. The rapid growth of Texas, Louisiana, Oklahoma, and other energy-endowed states has resulted from a large and growing national demand for energy products. Industries such as chemicals, iron, steel, transportation, and utilities were fast-growing industries in these areas.<sup>43</sup> Tertiary activities such as banking, real estate, and professional

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<sup>41</sup>Ibid.

<sup>42</sup>Ibid.

<sup>43</sup>Ibid.

services have also sprung up in the South and West in support of the export sector.

Amenity resources have also served as an export base for much of the Mountain and Sunbelt States. Americans tend to be heliocentric, and the increasing role demand for travel and recreation has meant a growing export market for regional amenity resources in such places as Florida, California, Texas, Arizona, and the Rocky Mountain states. Quality of life has also been marketed by many Sunbelt and Mountain states as a lure to people and industry.

Harry Perloff and Loudon Wingo have pointed out that while export of resource products provides one of the bases for regional economic development, extensive and continued growth can be expected to take place in those regions that achieve sizable internal markets.<sup>44</sup> The Sunbelt, as a result of massive in-migration over the past decade, would seem to have crossed that threshold. Growth has become self-sustaining as the region's industrial base has broadened and deepened.

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<sup>44</sup>H. Perloff and L. Wingo, "Natural Resource Endowment and Regional Economic Growth," in Natural Resources and Economic Growth by Joseph J. Spenger, (Washington, D.C., 1961), pp. 191-212.

Export base theory may also offer clues to understanding the relative decline of the Northeast in the national economy. In short, the region may be suffering from what Jean Fourastie has called a "tertiary crises" -- more people employed in tertiary activities than its primary and secondary sectors can support.<sup>45</sup>

A recent study by Mierynk summarized the debate regarding the role of the tertiary sector in regional economic development as follows:

In the late 1940's, Hyson and Neal argued that if the momentum of regional economic development is to be maintained, there must be a progressive shift of the labor from the secondary to the tertiary sector. The late Seymour Harris questioned this. He felt that a region can become too dependent on trade and service activities. A rising proportion of tertiary employment, he argued, does not always reflect an increasing standard of living. It may also reflect a deterioration in manufacturing, or a loss of a region's earlier comparative advantage. The same view has been advanced by Jean Fourastie who stated that a shift in the labor force from the secondary to the tertiary sector which is not the result of technological progress is evidence of growing economic weakness rather than increased economic strength. A region does not have a high per capita income because it has a large tertiary sector; rather as the real income of a region increases, it can afford to have a progressively larger proportion of its labor force engaged in trade and service activities.<sup>46</sup>

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<sup>45</sup>Weinstein and Firestone, op. cit.

<sup>46</sup>William H. Mierynk, "The Changing Structure of the Southern Economy" (North Carolina, 1977), Southern Growth Policy Board paper, pp. 6-7.

Weinstein commented that the Northeast manufacturing job loss didn't matter as conventional wisdom suggested; in fact the region was losing its basic export industries and substituting local service industries with a much narrower economic and tax base.<sup>47</sup>

The two components of economic base analysis, the basic and non-basic, were not fully developed until the late 1930's. Homer Hoyt developed the idea of a basic-service ratio.<sup>48</sup> This ratio purports to describe either (1) the proportion between total employment in a city's basic or export activities and total employment in its service or local activities; or (2) the proportion between the increase in employment in a city's basic or export activities and the increase in its service or local activities. From the data required to compute this basic-service ratio, a regional multiplier is easily calculated. This multiplier is equal to total employment in both basic and service activities divided by total increase in basic employment.

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<sup>47</sup>Weinstein, op. cit.

<sup>48</sup>Homer Hoyt, "Principles of Urban Real Estate," (New York, 1948), pp. 85-86, in R. B. Andrews, "An Historical Development of the Base Concept," Land Economics, 29, (May 1953), pp. 161-167.

By evaluating future prospects of expansion in the basic activities of the cities and regions, and then applying the employment multipliers derived from the basic-service ratios relating to existing industrial composition, future expansions in total employment can be projected.

After a unit of measurement is selected, such as employment or value added, the next step is to determine which industries are basic and which are non-basic. There are four methods that can be employed to make this determination: (1) the assumption approach, (2) the location quotient approach, (3) the minimum requirements technique, and (4) the coefficient of specialization, which is the method which will be employed in this analysis to determine basic and nonbasic industries. [Appendix L]

The assumption approach assumes that all of certain categories of economic activity are basic. For example, a common assumption is that all manufacturing and agricultural production is for exports and that all remaining economic activity is supporting activity.

The second indirect method for estimating the proportions of economic activity that are basic and non-basic, and one that seeks to identify the separate components within each industry, such as they may be, is based on the following formula:

$$X = \frac{(\text{nat'l employment in industry Y})(\text{total reg'l employment})}{\text{total nat'l employment}}$$

The solution for X indicates the number of workers that could be employed in industry Y if regional employment in this industry relative to total regional employment reflected national employment in this industry relative to total national employment.

The location quotient method holds that the extent to which actual regional employment in industry Y exceeds X represents regional specialization which is aimed at the export market, and therefore is the part which constitutes basic employment in that industry. The total basic and service sectors can be computer by applying the location-quotient formula to every industry represented in the region. The sum of the positive differences between actual and X values is the total for the basic section, and all remaining employment is non-basic.

The location quotient method will be employed in this paper because it is assumed that all industries have basic and non-basic employment. It is also the most useful method for this study since it is simple and practical.

The minimum requirement technique involves the selection of a large number of regions similar to the one that will be studied. For each region, the percentage distribution of



total employment among the various regional industries is computer. Then for each industry, the percentages attributed to it in the various selected regions are ranked by order of magnitude. A minimum-requirement profile, comprised of the lowest ranked value for each industry, may then be drawn up that covers all the industries represented in the study region.

The assumption underlying this approach is that the region in which an industry represents the smallest proportion of the total from among the selected regions contains the minimum requirement in that industry necessary to service local needs. From this, it follows that basic employment in the study region is the sum of employment in excess of the minimum-requirements level in each industry.

#### D. Conclusion

In conclusion, there are other theories of regional economic growth. Early attempts to define economic development in terms of growth stages were made by a number of economists, such as List, Hildebrand, Bucker, and Smaller. But probably the best known of the growth stage views of economic development is that posited by W. W. Rostow.<sup>49</sup>

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<sup>49</sup>W. W. Rostow, The Stages of Economic Growth (New York, 1960).

Another theory of capitalist development was postulated by Joseph A. Schumpeter.<sup>50</sup> In Schumpeter's view, the process of economic development emerges from the fiercely competitive environment of the capitalist system. The competitive struggle he called "creative destruction." Capitalism grows by destroying old economic structures and creating new ones. All firms and products are driven out of business by more efficient and innovative producers.

The following chapters will present the results of the two methodologies mentioned above. The results of shift/share analysis will be presented and also the results of economic base analysis.

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<sup>50</sup>Joseph Schumpeter, The Theory of Economic Development, (1934).

## CHAPTER IV

### PRESENTATION AND ANALYSIS OF DATA

#### A. Introduction

This chapter presents the analysis of regional growth and decline for the study period 1970 to 1980 and 1981 to 1984 for the nine regions of the United States. This chapter is an applied analysis of regional economic conditions. It is an intuitive approach in the sense that the author applies a practical and applied methodology and makes use of available labor market data to describe economic activity.<sup>1</sup>

The process of identifying key leading industries in a local economy is based on a combination of quantitative analyses with applications of qualitative factors.<sup>2</sup> The quantitative methods employed are Shift/Share Analysis and Economic Base Analysis. The qualitative tools consist of major publications, journals, articles, and extensive research by the author.

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<sup>1</sup>William L. McKee and Richard Froeschle, Where the Jobs Are (Kalamazoo, Michigan, 1985), p. 2.

<sup>2</sup>Ibid., p. 29.

The quantitative and qualitative tools are employed to lend support to hypothesis number one through nine in Chapter One. More specifically, the methods of Shift/Share and Economic Base are used to support the hypothesis that the redistribution of employment has shifted from the manufacturing belt or those regions associated with the manufacturing belt, namely, the East North and East South Central regions, the Mid-Atlantic, the New England, and the West North Central regions to the South and Western regions, namely, the South Atlantic, West South Central, Pacific, and Mountain regions. The methods will also support the hypothesis that the greatest amount of employment and the rate of growth of employment increases nationally and in the South and West regions have been more in the service industries and that the rate of manufacturing employment has slowed in both absolute and percentage terms.

The sequential process followed in this analysis is similar to the process discussed in William McKee's and Richard Froeschle's monograph entitled Where The Jobs Are.<sup>3</sup> It consists of (1) an analysis of the current industrial structure of the region to identify the industries which comprise the local economy; (2) an assessment of the change

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<sup>3</sup>Ibid., p. 31.

in industry employment over a recent historical period; (3) an examination of projected trends in industry employment; (4) an analysis of current employment trends, including an examination of average hours and weekly earnings, hourly earnings, unemployment rates (by use of qualitative studies) and the employment-population ratios; (5) a synthesis of the data; (6) an analysis of occupational trends, using both quantitative and qualitative sources.

#### **The Data Profile**

The data employed in the analysis was derived from several sources. Employment data for the industries for the years 1970 and 1980 were taken from the 1970 and 1980 census for total agricultural and nonagricultural employment published by the Bureau of the Census for the Department of Commerce. Similarly, employment data for 1981 and 1984 were taken from County Business Patterns by States, then summed to arrive at regional totals. County Business Patterns is published by the Census.

The analysis will begin with an examination of current trends of employment and occupation for background, followed by the author's analysis of these variables. The sequence will be to present the analysis of each region's industrial structure by responding to the sequential process stated

earlier, followed by a comparative analysis of the results and how certain trends differ for different regions of the country. Once again the causes of growth and decline are beyond the scope of this study, but there are solid indications that can be presented to describe this economic activity.

Establishment and industry payroll data were also taken from the County Business Patterns. Average hours of work and average hourly earnings and weekly earnings were taken from "Employment and Earnings" published by the Department of Labor by states; state totals were added to derive regional averages.

Other qualitative tools were employed such as articles and personal insight.

## **B. Past and Present Trends of U.S. Employment Growth and Occupational Growth**

### **1. Employment Trends**

The decline in manufacturing employment associated with the recession of 81-83, coupled with the continued growth of services, has renewed interest in the distribution of employment among the goods producing and service producing industries. While the U.S. economy has been a "service economy" for more than thirty years, the increasing shift

from goods production to service production has raised fears about a possible national "deindustrialization."<sup>4</sup>

Michael Urquhart examined the intersectoral employment shifts since 1952. His article examined component industries within the service sector to determine which industries have contributed the most to its growth.

The author states that most discussions have focused on the potential negative consequences of the continuing shift of employment to services, ignoring the fact that in the past, such growth has been closely associated with the economic progress and rise in per capital gross national product.<sup>5</sup>

According to the author, the association has been so strong that the growth of the services sector often has been considered an indication of the stage of economic development, and the relative importance of the three major sectors (service, goods, and agriculture) has been used to demarcate different stages of that development.<sup>6</sup> The author commented that since the work of Allen Fisher and Colin

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<sup>4</sup>Michael Urquhart, "The Employment Shift to Service, Where Did It Come From," Monthly Labor Review, Vol. 107, No. 4 (April 1984), pp. 17-22.

<sup>5</sup>Ibid., p. 15.

<sup>6</sup>Ibid., p. 15.

Clark in the 1930's, it generally has been assumed that economic development results in a shift of employment from agriculture to goods-producing industries and finally to services.<sup>7</sup>

Ronald Shelp has argued that the development of the services sector can and should encourage the growth in manufacturing. He commented that the growth of both sectors is complimentary.

Urquhart gave several explanations for the faster growth of service employment which included changes in the demand for goods and services as a result of rising incomes and relative price movements; slower productivity growth in services; the increasing participation of women in the labor force since WW II, and the growing importance of the public and nonprofit sector in general.<sup>8</sup>

He commented that no consensus exists on the relative importance of the above factors in developing any adequate explanation of the sectoral shifts in employment.

Victor Fuchs states that there is a strong empirical correlation between economic progress as measured by the

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<sup>7</sup>Colin Clark, The Conditions of Economic Progress (London, 1940), cited in Urquhart, "The Employment Shift to Service, Where Did It Come From."

<sup>8</sup>Urquhart, pp. 15-22. See James Cook, "So What's Wrong With a Service Economy?", Forbes Magazine, August 30, 1982, p. 66. Victor Fuchs, The Service Economy, NBER, 1963.



growth in per capita GNP and the service sector's share of total employment.<sup>9</sup>

Maurice Lengelle suggested a useful method for classifying countries into different stages of economic development based on the rate of growth of the service sector and the intersectoral shifts in employment. He stated that the industrial sector is the major source of employment growth in the service sector for the most advanced industrial societies.<sup>10</sup> Lengelle was referring to shifts of workers from one sector to another. He clearly stated that he was not referring to actual migrations but to relative or proportional changes in employment distribution. The movement or shift from goods producing to service producing is a result of the relative, rather than absolute, decline of employment in the goods sector. He concluded

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Thomas Stanback, Jr., Understanding the Service Economy (Baltimore, Md., 1979). Eli Ginsberg and George Vojta, "The Service Sector of the U.S. Economy," Scientific American (March, 1981), pp. 48-55. P. H. Minis and E. J. Hackett, "Work and the Work Force in the Non-Profit Sector," Monthly Labor Review (April, 1983), pp. 3-12.

<sup>9</sup>Urquhart cited by Victor Fuchs, "Economic Growth and the Rise of Service Employment," Reprint No. 257, (NBER), 1982.

<sup>10</sup>Maurice Lengelle, The Growing Importance of the Service Sector in Member Countries (Paris, 1966), pp. 8-9, cited by Urquhart, "Employment Shift."

that the U.S. economy reached the highest stage of economic development as early as the middle 1950's.<sup>11</sup>

Michael Urquhart examined employment shifts for the U.S. for three major sectors: agriculture, goods, and services. Agriculture was composed of agriculture, forestry, and fisheries industries; the goods sector was composed of mining, construction, and manufacturing; and all remaining industries were included in services. Government employees were included in the industry in which they work, with only public administration listed separately as a division in the services sector.

The sectoral distribution of employment over time is presented in Table IV. The author found that since 1850, agriculture's share of total employment declined steadily, while the service sector has exhibited almost continuous growth. The service sector accounted for over 70 percent of total employment in 1982.<sup>12</sup> Agriculture composed only 4 percent of total employment in 1982.<sup>13</sup>

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<sup>11</sup>Ibid.; however, Lengelle does not rule out the possibility that countries in this stage could also experience an absolute decline of employment in the goods sector, that at some point the continued growth of services could result in or be the cause of the "deindustrialization" of the economy.

<sup>12</sup>Urquhart, op. cit., p. 16.

<sup>13</sup>Ibid.

TABLE IV  
 DISTRIBUTION OF EMPLOYMENT BY SECTOR  
 1850-1982\*

YEAR	AGRICULTURE	GOODS	SERVICE
1850	64.5	17.7	17.8
1860	59.9	20.1	20.0
1870	50.8	25.0	24.2
1880	50.6	25.1	34.3
1880	43.1	28.3	28.6
1900	38.0	30.5	31.4
1910	32.1	32.1	25.9
1920	27.6	34.6	37.7
1930	21.8	31.7	46.6
1940	18.3	33.1	48.6
1952	11.3	35.5	53.3
1957	9.8	34.3	56.0
1962	7.8	33.1	59.1
1967	5.3	34.7	60.1
1972	4.4	31.4	64.2
1977	3.7	29.7	66.6
1979	3.6	30.2	66.3
1982	3.6	27.2	69.2

\*Data from Current Population Survey, Bureau of the Census for Bureau of Labor Statistics.

Actual employment in the goods sector increased through 1979 to about 30 million. During the 1980-82 period, employment decreased by almost 3 million, principally a result of the 1980 and 1981-82 recession.<sup>14</sup> Growth of the goods sector has resumed with the economic expansion in 1983 and 1984.

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<sup>14</sup>Ibid., p. 17.

Between 1952 and 1982 actual level of employment in agriculture declined by 50 percent to 36 million, and employment in the goods sector showed a modest gain of about 25 percent.<sup>15</sup> Despite the increase in goods sector employment, the author found that its share of total employment declined from 36 to 27 percent, as the services sector grew at a much faster rate, doubling to about 69 million to make up more than 2/3 of total employment.

The author found that transportation, communications, and public utilities grew rather modestly, at about the same rate as the goods sector, while trade and public administration increased at a somewhat greater pace.<sup>16</sup> Employment in finance, insurance, and real estate nearly tripled over the period, and the service division employment was up two and a half times.<sup>17</sup>

One of Lengelle's hypotheses was that the proportional expansion of the service sector in recent years has primarily resulted from the relative decline in the goods sector rather than in agriculture.<sup>18</sup>

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<sup>15</sup>Ibid.

<sup>16</sup>Ibid.

<sup>17</sup>Ibid.

<sup>18</sup>Lengelle, op. cit.

Urquhart tested this hypothesis by comparing changes in each sector's share of total employment for different time periods. The results showed that the goods sector's share of total employment tended to fluctuate between 33 and 35 percent for the period from 1952 to 1967.

The following tabulation shows relative shifts in employment in the major sector for five year intervals between 1952 and 1982:

TABLE V  
SHIFTS IN MAJOR SECTOR OF EMPLOYMENT  
1952 - 1982

YEAR	AGRICULTURE	GOODS	SERVICE
1952-57	-1.5	-1.2	2.7
1957-62	-2.0	-1.2	3.1
1962-67	-2.5	-1.6	1.0
1967-72	-0.9	-3.3	4.1
1972-77	-0.7	-1.7	2.4
1977-82	-0.1	-2.5	2.6

The decline in agriculture exceeded that of the goods sector for each of the three intervals from 1952 to 1967, the goods sector increased its share from 1952 to 1967. From 1967 to 1979 the goods sector's share of employment declined 4.5 percentage points, compared with a decline of only 1.7 points for agriculture<sup>19</sup> [Table VI].

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<sup>19</sup>Urquhart, op. cit., p. 17.

TABLE VI  
 SHIFTS IN INDUSTRY EMPLOYMENT  
 1952-1969

INDUSTRY	1952-1967	1967-1969
Agriculture	-4.5	-1.7
Goods-Producing	-0.6	-4.5
Service Producing	5.1	6.1

Urquhart also analyzed the extent of the shift to services by quantifying and comparing the actual employment level in a sector for a particular year with the level that would have been required for the sector to account for the same share of total employment as it did in an earlier year. The level of employment in the goods sector was 27.7 million in 1952 or 35.5 percent of the total. If the sector has maintained its share, in 1967 employment would have grown to 26.4 million. Employment increased only 25.8 million, a relative loss of 0.6 million jobs.

The author found that between 1967 and 1979 the goods sector accounted for more than 70 percent of the shift to services, having absorbed a relative loss of 4.5 million jobs compared with a 1.7 million loss in agriculture.<sup>20</sup>

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<sup>20</sup>Ibid.

An in-depth analysis by the author revealed that manufacturing accounted for the entire decline in the goods-producing sector as both mining and construction posted increases.

The loss in the service producing, primarily in the personal service industry of two million jobs was greater than the loss in agriculture. Other industries in the service sector which experienced a relative loss of jobs were public utilities (-0.9 million), postal employees (-0.3 million), and federal public administration (-0.4 million).<sup>21</sup> The increase in retail trade was due to employment growth in eating and drinking establishments.

At the division level, the service industry was by far the most dynamic. This division gained 3.7 million employees, equal to about 60 percent of the total shift to services.<sup>22</sup>

Professional and related services gained about 4.6 million jobs.<sup>23</sup> Its two components of health and educational services, contributed the most to this growth, with welfare and religious organizations also showing a sizable gain.

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<sup>21</sup>Ibid., p. 18.

<sup>22</sup>Ibid.

<sup>23</sup>Ibid.

According to growth rates, educational services and state public administration both grew about 54 percent between 1967 and 1979, yet the former showed a relative gain of 1.1 million employees while the latter gained only a modest 127,000.<sup>24</sup>

The author found that between 1967 and 1979, seven industries gained at least half a million employees: health services; eating and drinking establishments; educational services; business and repair services; real estate; welfare and religious organizations; and finance (banks, security and commodity brokers).<sup>25</sup> Between 1980 and 1982, however, not all of these seven industries mentioned earlier fared equally well. Health services (up 11.7 percent), business and repair services (19.8 percent), eating and drinking (1.6) and finance (14.9) all continued their expansion.<sup>26</sup> Employment in real estate posted a decline of 5.7 percent. Retail also showed a small decline.<sup>27</sup>

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<sup>24</sup>Ibid.

<sup>25</sup>Ibid., p. 26.

<sup>26</sup>Ibid., p. 21.

<sup>27</sup>Ibid.



From his analysis, Urquhart concluded that employment shifts to services does not stem from an actual migration of workers from one sector to another but rather results from the expansion of the labor force.

The United States industrial structure between 1970 and 1980 changed by a percentage increase of 27 percent [Table VII]. Between 1970 and 1980, employment increased in absolute terms by 21,085,756 persons. The percentage increase from 1981 to 1984 was 4.20 percent which is an absolute increase of 3,145,164 persons [Table VIII]. The major industries with the largest percentage increase between 1970 and 1980 were mining (63.33%); finance, insurance, and real estate (53.66%); services (36.45%); and wholesale trade (34.59%). All major industries increased more than the percentage change for the U.S. The increase in these industries is assumed due to the demand for accountants, health workers, computer programmers, lawyers, and other service-oriented industries.

TABLE VII  
INDUSTRIAL EMPLOYMENT IN THE UNITED STATES  
1970-1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	76,553,599	97,639,355	21,085,756	27.54
Agri. & Forest	2,840,488	2,760,213	-80,275	- 2.83
Mining	630,788	1,028,178	397,390	63.00
Construction	4,572,235	5,739,598	1,167,363	25.53
Manufacturing	19,837,208	21,914,754	2,077,546	10.47
Total Durables	11,741,017	13,479,211	1,738,194	14.80
Furniture/ Lumber	978,393	1,229,394	251,001	25.65
Primary Metals	1,211,851	1,307,768	95,917	7.91
Fab. Metals	1,436,480	1,424,362	-39,118	- 2.67
Machinery excep				
Electrical	1,991,042	2,766,615	775,573	38.95
Electrical	1,904,9205	2,198,833	293,908	15.43
Motor Vehicles	2,138,880	2,428,452	289,572	13.54
Other Durables	2,052,446	2,123,787	71,341	3.48
Total Non- Durables	8,096,191	8,435,543	339,352	4.19
Food & Kindred	1,390,339	1,533,548	143,209	10.30
Textile Mills	2,184,145	2,246,784	62,639	2.87
Print/Publish	1,191,624	1,531,029	339,405	28.48
Chemicals	987,728	1,272,484	284,756	28.83
Other Non- Durables	2,342,355	1,851,698	-490,657	-20.95
Transportation	5,186,101	7,087,455	1,901,354	36.66
Railroads	636,572	577,59	-59,053	- 9.28
Truck Service	1,082,530	1,546,486	463,956	42.86
Other transport	1,109,287	2,149,956	1,040,669	93.81
Communication	1,073,663	1,440,868	367,205	34.20
Utilities	1,284,049	1,372,626	88,577	6.90
Wholesale Trade	3,133,382	4,217,232	1,083,850	34.59

TABLE VII--Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Retail Trade	12,239,498	15,716,694	3,477,196	28.41
Food & Bakery	1,912,562	2,503,595	591,033	30.90
Eating/Drinking	2,299,380	4,181,272	1,881,892	81.84
General Merchan.	2,086,639	2,091,598	4,959	.24
Motor Vehicles	1,698,694	1,907,506	208,812	12.29
Other Retail	4,242,223	5,032,723	790,500	18.63
<b>FIRE</b>	<b>3,838,387</b>	<b>5,898,059</b>	<b>2,059,672</b>	<b>53.66</b>
Banking & CU	1,293,433	2,221,438	928,005	71.75
Insurance/Real Estate	2,594,954	3,676,621	1,131,667	44.47
<b>Services</b>	<b>24,275,512</b>	<b>33,123,796</b>	<b>8,848,284</b>	<b>36.45</b>
Business Serv.	1,294,899	2,724,596	1,429,997	110.46
Repair Service	1,099,988	1,357,081	257,093	23.37
Priv. Household Other Personal Services	1,126,016	701,460	-424,556	-37.70
	2,410,560	2,374,304	-36,256	- 1.50
Entertainment	631,193	1,007,070	357,077	59.55
Hospitals	2,689,722	4,424,547	1,734,825	64.50
Health Services	1,556,465	2,825,918	1,269,453	81.56
Elem. & Second.	5,814,516	8,013,176	2,098,660	37.81
Other Education	333,284	364,037	30,753	9.23
Welfare/Relig.	1,163,415	2,115,878	952,463	81.87
Legal	1,953,802	2,068,263	114,461	5.86
Public Adminis- tration	4,201,652	5,147,466	945,814	22.51

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

The industries with the largest absolute increase in employment were: (1) services which added 8,848,284 persons; (2) retail trade which added 3,477,196 persons; (3) FIRE which added 2,059,672 persons; and (4) manufacturing which added 2,077,546 persons to its payroll. Manufacturing only

increased percentage-wise by 10.47 percent, which increased less than all the other major industries except agriculture which decreased by -2.83 percent which is an absolute decline of -80,275 persons. This could indicate that manufacturing nationally is losing its prowess as a major employment power. The industries of services, FIRE, retail trade, and wholesale trade represented 73 percent of the total change for the United States. This shows that the United States over this period has gained more employees in the service sector as opposed to the manufacturing industries. There were slow gains in the motor vehicles industry, electrical machinery and machinery except electrical.

Out of the nine major industries sectors, all increased their share of employment as a percent of total employment from 1970 to 1980 except agriculture, construction, and manufacturing. In 1970 agriculture, construction, and manufacturing composed 3.71 percent, 5.97 percent, and 25.91 percent respectively. In 1980 the percentage of total employment for each industry fell to 2.83 percent, 5.88 percent, and 22.44 percent respectively.

Within manufacturing, both durable and non-durable goods industries fell off during this period. Within the durable goods sector, all industries such as primary metals, fabricated metals, electrical machinery decreased their

percentage of total employment from 1970 to 1980. The industry with the largest increase in the manufacturing sector in terms of both absolute and percent change was in the machinery except electrical group. The increase from 1970 to 1980 was 38.95 percent. The absolute increase was 775,573 persons. The only industry that lost employment was the fabricated metals group which lost 39,118 persons or a percentage decrease of -2.67 percent.

Within the non-durable goods group, the category of other non-durables showed the largest decrease in employment of -490,657 persons or a percentage decline of -20.95. The groups with the largest percentage and absolute increase were printing and publishing which increased by 339,405 persons or 29 percent, and chemicals which increased by 284,756 persons of a percentage increase of 29 percent also.

Transportation was another significant industry for this study period. This group added 1,901,354 persons between 1970 and 1980 and increased its share of total employment in 1970 of 6.77 percent to 7.26 percent in 1980. Most of the increase was in the other transportation group. Railroad service lost employment of -59,053 persons or a decline in percentage terms of eight percent.

For the service industry, most of the employment gains were in business services, hospitals and health services, and elementary and secondary education. The largest decreases in the service group were in private household and other personal service groups. It is interesting to point out that the public administration group increased 22.5 percent between 1970 and 1980. This is an absolute increase of 945,814 persons.

For the 1981 to 1984 period, those industries that showed a decline for the 1970 to 1980 period also showed a decline for this period. Industries that showed a decrease in employment were: (1) mining, (2) construction, (3) manufacturing. Construction decreased by -7.63 percent or by 344,376 persons while manufacturing decreased by -5.40 percent of -1,102,978 persons. Similarly construction composed 6.03 percent of total employment in 1981, and this percentage fell to 5.35 percent in 1984. Likewise, manufacturing made up 27.29 percent of total employment in 1981 but only 24.78 percent in 1984. The decline in mining, construction, manufacturing, and transportation totalled 1,748,700 persons which is 56 percent of the total change. This indicates that the industries that were at one time responsible for the majority of employment all fell between

TABLE VIII  
UNITED STATES EMPLOYMENT FOR SELECT YEARS OF 1981 AND 1984\*

INDUSTRY	E M P L O Y M E N T		% CHANGE	TOTAL CHANGE	U.S. % of 1981 Total	U.S. % of 1984 Total
	1981	1984				
Total	74,850,402	77,995,566	4.20	3,145,164	100.	100.
Agriculture	302,694	356,881	17.90	54,187	.4044	.4576
Mining	1,107,726	974,285	-12.05	-133,441	1.47	1.25
Construction	4,516,139	4,171,763	- 7.63	-344,376	6.03	5.35
Manufacturing	20,428,330	19,325,352	- 5.40	1,102,978	27.29	24.78
Transportation	4,843,290	4,675,385	- 3.47	-167,905	6.16	6.00
Wholesale	5,260,928	5,387,724	- 2.41	-126,796	7.03	6.91
Retail	15,039,998	16,080,830	6.92	1,040,832	20.09	20.62
Finance	5,409,780	5,783,225	7.40	373,445	7.22	7.41
Services	17,353,751	20,349,322	17.26	2,995,571	23.18	26.09
Unclassified	587,776	890,799	5.2	303,033	.78	1.14

\*Employment taken from Country Business Patterns 1981 and 1984 as of March of each year. Department of the Census.

1970 and 1980 and from 1981 to 1984. This indicates a shift from durable goods employment to services employment.

The industries that increased for the 1981 to 1984 period were all in the so-called service producing sectors. They were: (1) services which increased 17.26 percent; (2) unclassifiabes which increased 52 percent, and (3) retail trade which increased 6.92 percent. Services employment increased by almost three million persons. It composed 23.18 percent of total employment in 1981 and increased to 26.09 percent in 1984.

The industries experiencing the largest absolute increases were business services employment, health services, and educational services. It seems that the business service industry is going to continue to grow because of the increased demand by consumers for tax assistance, medical needs, financial planning, and other basic needs that are provided without much capital investment on the part of the businessman providing the service.

In terms of business establishments data, some interesting trends emerged from the data. First, examining the number of establishments along with their levels of employment can pinpoint the industrial identification and concentration of large and small employers. The data on the



TABLE IX  
 NUMBER OF BUSINESSES ESTABLISHMENTS\*  
 1981-1984

INDUSTRY	NO. OF BUS. ESTABLISH.		PERCENT CHANGE	TOTAL CHANGE
	1981	1984		
Total	4,586,510	5,517,715	20.30	931,205
Agriculture	47,746	61,656	29.13	13,910
Mining	33,196	36,693	10.53	3,497
Construction	400,077	458,654	14.64	58,577
Manufacturing	321,290	350,740	9.16	29,450
Transportation	171,614	198,147	15.46	26,533
Wholesale	390,160	430,983	10.46	40,823
Retail	1,238,250	1,409,531	13.83	171,281
Finance	417,828	477,750	14.34	59,922
Services	1,333,297	1,664,926	24.87	331,629
Unclassified	233,052	428,635	83.92	195,583

TABLE X  
 PAYROLL BY BUSINESS ESTABLISHMENTS\*  
 1981-1984

INDUSTRY	PAYROLL BY BUS. ESTABLISH.		% CHANGE	TOTAL CHANGE
	1981	1984		
Total	1,149,719,079	1,407,246,027	22.40	257,526,948
Agriculture	3,532,374	4,702,842	33.14	1,170,466
Mining	27,554,948	28,329,365	2.81	774,417
Construction	80,048,233	89,608,645	11.94	9,560,412
Manufacturing	388,060,276	439,392,759	13.23	51,332,483
Transportation	7,405,652	115,736,564	18.82	18,330,912
Wholesale	98,768,891	119,81,418	21.30	21,042,527
Retail	133,762,928	166,143,415	24.21	32,380,487
Finance	86,608,120	118,357,889	36.66	31,749,769
Services	226,312,414	311,453,101	37.62	85,140,687
Unclassified	7,665,234	13,710,049	78.86	6,044,806

\*Employment data taken from Country Business Patterns 1981 and 1984 as of March of each year. Department of the Census.

number of establishments were taken from County Business Patterns as mentioned earlier.

The number of business establishments in the United States for 1970 totalled 4,586,510 as of March 15, 1981. In 1984 this number increased to 5,517,715 establishments. This is a percentage increase of 20.30 percent and an absolute increase of 931,205 thousand establishments.

The categories of unclassifiabes, services, and surprisingly, agricultural establishments all had percentage increases for this period greater than those for the nation. There were 331,529 more establishments in the service industry in 1980 than in 1970. Likewise, there were an additional 171,281 establishments in retail trade. Similarly, the FIRE group added an additional 59,922 establishments. [Table IX.]

The same trends emerge when payroll data was examined [Table X]. Those industries showing gains were the same industries posting gains in employment and the number of business establishments added. Services increased its payroll by \$85,140,687 dollars while retail trade, wholesale trade, and FIRE combined for a total of an additional \$71,123,308. As can be seen from the above information, services alone increased more than these three industries combined. These three industries totalled 27.61 percent of

the total increase in payroll while services totalled 33.06 percent.

From the employment data, business establishment data, and payroll data, it can be stated that the data reflects and indicates a continuing shift to service sector employment.

## 2. U.S. Industry Earnings and Hours of Work

In observing changes in average weekly and average hourly earnings of production or nonsupervisory workers on nonagricultural payrolls, it appears that construction had the highest weekly and hourly earnings in 1970.<sup>28</sup> By 1975 the average hourly earning in construction was \$7.31 and the average weekly earning was \$266.08. This was greater than the average for the U.S. which was \$4.57 per hour and \$163.33 per week.

For 1970 mining hourly earning was \$3.85, then \$5.95 in 1975, moving to \$9.17 in 1980 and finally to \$11.98 in 1985.

Hourly earnings in construction went from \$9.94 in 1980 to \$12.31 in 1985. Similarly, weekly earnings moved up from \$367.78 in 1980 to \$464.09 in 1985. The averages for the

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<sup>28</sup>Employment and Earnings, U.S. Department of Labor.

U.S. in 1980 and 1985 were \$6.66 to \$8.57 per hour and from \$235.10 in 1980 to \$299.09 in 1985.

The third largest industry in terms of hourly and weekly earning was recorded in the transportation industry, followed by manufacturing. The hourly earning in transportation in 1970 was \$3.85, moved to \$5.88 in 1975, then to \$8.87 in 1980 and finally to \$11.40 in 1985. The weekly earning went from 155.93 in 1970 to \$450.30 in 1985.

Small hourly and weekly earnings were found in retail trade and wholesale trade, and FIRE and services. The weekly earning in retail trade was \$82.47 in 1970, rising to \$108 in 1975 and finally to \$174.64 in 1985. The FIRE industry was the one with the largest weekly earning in the service category in 1985 of \$289.02 per week.

These low wages in retail trade, services, and FIRE reflect the view that the wages are lower and consequently most of the growth in these industries occurred in the southern and western parts of the country. The high wages were in industries associated with the manufacturing belt of the regions of the East North Central, West North Central and Middle Atlantic.

The number of weekly hours worked also was strong in manufacturing, transportation, and mining. The average weekly hours worked in 1970 was 37.1 for the U.S. This

moved down to 36.1 in 1975, down further in 1980 to 35.3, and down even further in 1985 to 34.9 hours.

Average hours in construction were 37.3 in 1970, falling to 36.4 in 1975, rising in 1980 to 37 and then rising to 38 in 1985. Mining was 43 hours in 1970 and remaining at that level for 1975, 1980, and 1984. This industry had the largest number of hours worked in any one year between 1970 and 1985.

Manufacturing hours worked in a week totalled 40 hours in 1970 and remained at 40 hours in 1980 and 1985.

Service and FIRE had the lowest number of hours worked in a week. The average hours worked was between 33 hours per week to 36 hours per week in these industries.

In a study on regional wage differentials between 1975 to 1983, the author of the study, Lorie Jackson, found some interesting but not surprising results. The purpose of her article was to estimate wage differentials between the East North Central region and two Southern regions in 1975 and 1983, and to discuss the changing nature of the differential over this period.<sup>29</sup>

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<sup>29</sup>Lori Jackson, "The Changing Nature of Regional Wage Differentials from 1975 to 1983," Economic Review, Federal Reserve Bank of Cleveland, pp. 12-23.

The Southern regions considered were the East South Central and the South Atlantic regions. They were chosen to examine the widely held view that wages in the ENC region are far out of line with wages in the Southern regions, and that this had been a major reason for the relative decline in manufacturing employment in the ENC region.

She found in the two periods considered that the ENC region had the third highest average wage level of the nine census regions, while the South Atlantic and the East South Central areas had the two lowest. The average hourly wage of a nonfarm worker between the ages of 25 and 64 in 1975 was \$5.49 in the East North Central, compared to \$4.47 in the East South Central and to \$4.49 in the South Atlantic. In 1983 she found the average hourly wage had risen to \$9.11 in the EWC, to \$7.69 in the ESC, and to \$7.76 in South Atlantic. She also found that while money wages in the Southern regions were well below those in the ENC region in both 1975 and 1983, the absolute percentage differentials declined by three percentage points over this period. The absolute wage differential between the East North Central and the South Atlantic regions went from about 18 percent in 1975 to 15 percent in 1983, while the differential between the ENC and ESC regions went from 19 to 16 percent.

In her conclusion, she found great similarity in the nature of wage differentials between the ENC and the ESC and South Atlantic regions. In both 1975 and 1983, she stated that structural differences accounted for most of the wage differentials between ENC and the Southern regions.

The similarities she found were that between 1975 and 1983, there was a small wage convergence which was the result of growing similarities in the composition of the work force. The characteristics of the Southern regions have become more similar to those of the ENC population, thereby causing the importance of compositional differences in the overall wage differential to decline. The author stated that the wage differential will continue to persist for some time. This suggests that considerable attention should be given to improving productivity in the ENC and in other high-wage regions in order to compensate for the region's higher although converging wages.

### 3. U.S. Occupational Trends

Since census data was used for the 1970 and 1980 years for employment, it was also used for occupational analysis. It is not surprising then that occupations increase at the same rate as total employment. This increase was 27.54 percent of by 21,085,756 persons. The occupational struc-

ture for the analysis is broken down into nine categories. They are as follows: (1) managers and professionals, (2) sales occupations, (3) clerical, (4) craftsman, (5) operators, (6) transportation workers, (7) laborers, (8) farm laborers, and (9) service occupations. [Table XI]

The occupational categories that increased the most in absolute terms were managers and professionals, sales occupations, clerical, and service occupations. Within the managers and professional category, engineers, teachers, and health workers posted the greatest gain.

The occupational categories of managers and professionals, sales, and clerical accounted for 71 percent of the total increase in employment for the 1970 to 1980 period.

The occupational category of operators showed the largest decline of some 1,411,062 jobs or a percent decline of -13.44 percent. Farm managers and private household occupations were the others to show a decline for a combined decline of 690,117 jobs or less than 4 percent of the total change.

In an independent analysis of occupational trends, Carol Boyd Leon found that job gains occurred in most occupational groupings in which Americans were employed during the



TABLE XI

OCCUPATIONAL EMPLOYMENT IN THE UNITED STATES\*  
FOR 1970 - 1980

	EMPLOYMENT 1970	EMPLOYMENT 1980	% OF TOTAL 1970	% OF TOTAL 1980	TOTAL CHANGE	% CHANGE
TOTAL, United States	76,553,599	97,639,355	100.00	100.00	21,085,756	27.54
Manager/Professional	17,719,963	25,133,599	23.15	25.74	7,413,636	41.84
Managers & Administrators	6,371,149	10,133,551	8.32	10.38	3,762,402	59.05
Professional Specialists	11,348,814	15,000,048	14.82	15.36	3,651,234	32.17
Engineers	1,207,509	2,150,707	1.58	2.20	943,198	78.11
Physicians	538,746	643,716	0.70	0.66	104,970	19.48
Health Workers	1,204,822	1,695,436	1.57	1.74	490,614	40.72
Teachers	2,540,420	4,675,632	3.32	4.79	2,135,212	84.05
Other Technicians	5,857,317	5,834,557	7.65	5.98	-22,760	-0.39
Sales Occupations	5,443,318	9,760,157	7.11	10.00	4,316,839	79.31
Clerical	13,745,144	16,851,398	17.95	17.26	3,106,254	22.60
Craftsmen	10,608,010	12,594,175	13.86	12.90	1,986,165	18.72
Operators	10,496,050	9,084,988	13.71	9.30	-1,411,062	-13.44
Transportation	2,957,935	3,289,213	3.86	3.37	331,278	11.20
Laborers	3,426,546	5,485,142	4.48	5.62	2,058,596	60.08
FM MGR & LAB	2,379,545	2,811,258	3.11	2.88	431,713	18.14
Farm Manage	1,426,044	1,298,670	1.86	1.33	-127,374	-8.93
Farm Laborer	953,501	1,512,588	1.25	1.55	559,087	58.64
Service Occupations	9,777,088	12,629,425	12.77	12.93	2,852,337	29.17
Cleaning Occupations	1,861,502	2,745,403	2.43	2.81	883,901	47.48
Food	2,773,573	4,384,936	3.62	4.49	1,611,363	58.10
Protective	952,237	1,475,315	1.24	1.51	523,078	54.93
Other	3,037,681	3,434,419	3.97	3.52	396,738	13.06
Private Household	1,152,095	589,352	1.50	0.60	-562,743	-48.85

\*Occupational data taken from 1970 and 1980 Census Data, Department of Commerce

1970's, but close to half of the overall employment increase took place in just twenty of the two hundred thirty-five occupations. The author of this article looked at employment changes among the biggest occupational winners and losers of the 1970's. The author used two sets of criteria. An occupation must be one of the top twenty in terms of the number of workers added to the annual average employment level between 1972 and 1980. These increases ranged from more than 200,000 to nearly one million; alternately, the job group must have been one of the twenty which grew by 75 percent or more. The majority of occupations which met these tests were in either professional or clerical fields. Four job groups -- computer specialists, computer operators, health technologists and technicians, and bank tellers -- met both criteria.

The author used data from the current population survey and used the occupations which posted a 1980 annual average employment level of 50,000 workers or more.

The author found that about half of the 15.6 million increase in employment between 1972 and 1980 took place among two white-collar groups -- professional and technical workers rose by 4.2 million and clerical workers registered

a gain of 3.9 million. Next highest were managers and administrators with an increase of 2.9 million, service workers (excluding households) with 2.4 million, and craft and kindred workers with 1.7 million. When the author used growth rates as a variable, he found a similar pattern. The white-collar group -- in particular professionals, managers, and administrators, and clerical workers -- experienced the fastest growth between 1972 and 1980, followed by service workers (excluding private household) [Table XII].

The only blue collar occupational group which even came near the average growth rate was craft and kindred jobs. The author explains this by stating that as the service producing sector expanded, so did office and service jobs, while slow growth in manufacturing and other goods producing industries limited the increase in the employment of production workers.

TABLE XII  
EMPLOYMENT CHANGE BY OCCUPATION

OCCUPATION	EMPLOYMENT CHANGE IN PERCENT
TOTAL	19.1
White Collar	30.0
Professional and Technical Managers and Administrators except Farm	36.3
Sales Workers	35.9
Clerical and Kindred	15.3
Blue Collar Workers	27.1
Craft and Kindred	7.8
Operators except transport	15.9
Transport Operators	0.1
Non-farm Labor	8.0
Service Workers	6.9
Private Household	18.2
Other Service Workers	-27.6
Farm Workers	25.1
	-11.9

The results of Carol Leon's study showed that workers employed in white collar occupations reached 50 percent for the first time in 1976 and exceeded 52 percent by 1980.<sup>33</sup> The increase can be attributed to three occupational groups -- professional and technical workers, managers and administrators, and clerical workers.

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<sup>33</sup>Ibid., p. 25.

The author found that most growth took place among professional workers. Seven specific occupations with increases of 200,000 or more fall under this heading. The biggest employment gain was among registered nurses. The number of physicians increased too, but their rate of growth was slower than that of other health workers.

The advance of over 500,000 registered nurses during 1972-80 occurred mainly among those in hospitals and medical offices [Table XIII].

The category of health technologists and technicians was among the biggest gainers. The author offers the explanation of the demand for highly skilled persons to operate highly sophisticated diagnostic and therapeutic equipment. This occupation grew by 255,000. The increases were in hospital workers, particularly those employed in clinical laboratories and radiologic technicians.

The author found that the therapist occupation posted a gain of 85 percent, about 100,000.

The second group in the professional category that recorded a sizable gain and which the author found to have the next largest increase after nurses -- about 335,000 -- was accountants. The rate of growth was about twice that of total employment. Most of the increase took place in the

TABLE XIII

OCCUPATIONS\* WITH THE LARGEST ABSOLUTE INCREASES  
IN EMPLOYMENT BETWEEN 1972 AND 1980\*\*

OCCUPATION	EMPLOYED		INCREASES	
	1972	1980	NUMBER	%
Total employed	81,702	97,270	15,568	19.1
<b>Professional &amp; technical workers:</b>				
Accountants	714	1,047	333	46.6
Computer specialists	273	584	311	113.9
Engineering and science technicians	828	1,095	267	32.2
Engineers	1,102	1,433	331	30.0
Health technologists/technicians	315	571	256	81.3
Lawyers	303	522	219	72.3
Registered nurses	801	1,302	501	62.5
<b>Salesworkers:</b>				
Real estate agents/brokers	349	582	233	66.8
Sales reps, wholesale trade	696	915	219	31.5
<b>Clarial workers:</b>				
Bank tellers	288	531	243	84.4
Bookkeepers	1,584	1,904	320	20.0
Cashiers	988	1,554	556	55.7
Computer/peripheral operators	196	522	326	166.3
Secretaries	2,949	3,876	927	31.4
<b>Craft workers:</b>				
Heavy equipment mechanics	714	963	249	34.9
<b>Transportation equipment operatives:</b>				
Truckdrivers	1,441	1,844	403	28.0
<b>Nonfarm laborers:</b>				
Stockhandlers	723	941	218	30.2
<b>Service workers:</b>				
Building interior cleaners excluding janitors and sextons	668	932	264	39.5
Cooks	866	1,331	465	53.7
Waiters	1,124	1,416	292	26.0

\*Data from Current Population Survey

\*\*Numbers in thousands

service industries such as accounting, auditing, and bookkeeping services. About 20 percent occurred in manufacturing durable goods industries. Fifty percent was spread among public administration, banking and finance, and insurance.

Engineers increased by 330,000 persons. More than half of these jobs were in manufacturing. Industrial and electrical engineers followed by mechanical experienced the most increase.

The number of persons employed as computer programmers came close to doubling during the 1972 to 1980 period, while computer systems analysts were not far from tripling their 1972 level. Large increase for computer specialists were in transportation, public utilities, finance, insurance, and real estate industries.

Two of the three professional occupations which more than doubled were under the social sciences heading -- psychologist and economist. Psychologists increased by 55,000, and economists increased by 70,000. Thirty percent of the economist job gains were in manufacturing, while banks and business services such as research companies and management consulting firms made up thirty percent.

Jobs for managers and administrators increased nearly as quickly as those for professional workers. Health administrators experienced the largest relative rate of growth of 80 percent as more than 90,000 employees were added.

Sales worker occupation growth was slower than the national average. They increased by 800,000 or 15 percent.

The service worker group of occupations increased and composed nearly 90 percent of the service producing jobs. Most jobs with increases were cooks, building interior cleaners, welfare and health aids occupations.

Blue collar occupations accounted for only one-seventh of the overall increase in jobholders since 1972. The occupations of craft and kindred, operators, and transportation equipment operators all posted slow growth rates. Jobs in these occupations were the losers. Delivery route workers, child care workers, private household workers all declined.

From the author's analysis, the jobs that gained for this 1972-1980 period were in professional and service workers. Most blue collar occupations grew slowly or did not grow at all.

The results of Carol Leon's study showed that workers employed in white collar occupations reached 50 percent for



the first time in 1976, and exceeded 52 percent by 1980. The increase can be attributed to three occupational groups -- professional and technical workers, managers and administrators, and clerical workers.

The author found that most growth took place among professional workers. Seven specific occupations with increases of 200,000 or more fall under this heading [Table XIII]. The biggest employment gain was among registered nurses.

### C. Analysis by Region

#### 1. West South Central Region

The West South Central region is 437,701 square miles with 55.6 persons per square mile. The labor force characteristic for the West South Central region totalled over 10 million in 1980. The total labor force of persons sixteen years and older was over 17 million. The civilian labor force totalled over 10 million. Employed persons totalled

10,114,829 persons. The percent unemployed as a percent of the civilian labor force totalled 4.6 percent in 1980. The labor force participation rate was 61 percent in 1980. The employment population ratio in 1980 was 58 percent. This was one percentage point less than the rate in 1979. The rate in 1979 was 60.4 percent,<sup>39</sup> 57 percent in 1976,<sup>40</sup> rising again to 60 percent in 1982 and declined back to 59 percent in 1983.<sup>41</sup>

Private wage and salary workers totalled 7,605,920 persons while federal government workers comprised 343,000, state workers 473,000, and local government workers 853,000.<sup>42</sup> Males sixteen to fifty-four totalled six million, and females sixteen to fifty-four years of age totalled close to seven million, short by 400,000.

The population for the region was 12,157,000 in 1974 rising to 12,300,000 in 1980 and then to 12,400,000 in 1983.<sup>43</sup> The two most heavily populated states in the region

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<sup>39</sup>Carol Boyd Leon, "The Employment-Population Ratio," Monthly Labor Review, Vol. 104, No. 2, pp. 36-45.

<sup>40</sup>Ibid., p. 20.

<sup>41</sup>Ibid.

<sup>42</sup>U. S. Census Data, 1980, Department of Commerce.

<sup>43</sup>Local Area Personal Income, Department of Labor.

are Texas and Oklahoma.

The West South Central region registered an employment level of over 10 million persons in 1980 [Appendix C]. The major industries groups showing the largest employment levels in the year 1980 were services, which totalled 3,255,542 persons; manufacturing with 1,779,840 persons; retail trade, 1,663,659 persons; and transportation combined for a total 1,629,809.

The manufacturing industries employed 1,544,249 in 1984 as of March of that year, and services comprised close to two million. In 1980 manufacturing was 17.79 percent of total employment rising to 18.40 percent in 1984; services 32.19 percent in 1980 falling to 23 percent in 1984; retail trade 16.45 percent in 1980 to 21 percent in 1984; and construction 8.43 percent in 1980 to 7.91 percent in 1984.

Within manufacturing for the 1970 to 1980 period, the durable goods category showed the greatest absolute increase of 455,476 additional jobs. Machinery except electrical and the electrical machinery industries had a combined total of 214,584 increase in employment. These two groups also had the largest percentage increase of 137 percent and 78 percent respectively. Nondurables increased by 31.05

percent with the largest increase in chemicals followed by the printing and publishing industry.

Services was the industry with the largest absolute increase with the majority of the increase in the category of elementary and secondary education, followed by hospital and other health services industries and business services.

For the 1981-84 period, the numbers confirm those of the previous period but because of the shorter time period, employment did not increase that much. [Appendix C-1]. Employment increased only by 568,128 persons, which is roughly 142,000 persons per year. Not unlike the previous period, the manufacturing, retail trade, and services showed the largest absolute increases. The three industries had a combined total of an additional 1,080,385 jobs, but this was offset by a decline in the construction and transportation industries of some 500,000 jobs.

In terms of the percent distribution of the major industries, some interesting statistics emerge. In 1970 manufacturing composed 18.40 percent of total employment. This percentage fell to 17.79 percent in 1980 and 11.25 percent in 1981. This is not surprising considering the recession of 1981-1983 period. The percentage distribution shifted to 18.70 percent increase in 1984. This was probably due to the upswing in the business cycle. Had

manufacturing kept the same percent distribution in 1980 and 1981 as it had in 1970, it would have grown by 1,861,129 persons and 1,414,626 persons respectively. The difference between the distribution in 1970 and had it kept the same distribution in 1980 is a net of 595,966 fewer persons employed. Similarly, the difference is 149,463 for the 1981 period less employed. Only the category of machinery except electrical and electrical machinery increased the percent distribution from 1970 to 1980.

For services, the percent distribution in 1970 was 32.71 percent. In 1980 the percent distribution fell to 32.19 percent, and similarly falling in 1981 to 21.52 percent. It did rise in 1984 to 23 percent following the expansion period.

For the 1980 year total business totalled over 500,000 establishments. The industries with the greatest number of establishments in 1980 were in services, retail trade, followed by construction and manufacturing. There were over 120,000 establishments in services, 115,000 in retail trade, and over 600,000 in manufacturing for the year 1980.

The number of business establishments rose by 117,241 between 1981 and 1984 [Appendix C-1]. This is a percent change of 23.38 percent. The largest absolute change was in services, retail trade, and unclassifiables. Services added

an additional 40,000 establishments while retail trade and unclassifiabes added 23,000 and 20,000 respectively. It is not surprising that these same industries had the largest increase in their payrolls [Appendix C-1]. Manufacturing increased their payrolls by 38 percent and unclassifiabes by 53 percent. The largest percentage increase was in the FIRE industries which also had a gain in their payroll of close to four million dollars.

Using the coefficient of specialization to determine base industries is only one method of several methods. When the coefficient of specialization is used as an indicator of basic industries, those industries that have a coefficient of greater than one are basic and those that are less than one are nonbasic. For the West South Central region, the major industries with coefficients greater than one were services, retail trade, wholesale trade, and transportation for the year 1980. [Appendix M] Within the retail trade industry, the industries of food and bakery, general merchandising, motor vehicles, and other retail trades had coefficients greater than one.

Within the service industry, private households, other personal services, and entertainment all had coefficients greater than one in 1980. In the transportation industry,

these industries were trucking services, other transportation and utilities were all basic industries.

There were no industries in manufacturing that were basic industries for 1980 when the coefficient of specialization was used. Mining did show a coefficient of 3.40 and agriculture had one of 1.16.

For the 1981 and 1984 periods, industries with coefficients greater than one in both years were agriculture, mining, transportation, wholesale and retail trade, and unclassifiabes. These were this region's basic industries and composed the region's economic base.

Shift/Share Analysis: The overall components of change from the shift/share analysis were all positive for the West South Central region [Appendix C-2]. The national share component totalled 1,894,324 persons while the industry mix was 104.154 persons and the local share component a positive 1,238,851 persons. This region grew faster than the national average by some 1,343,003 persons. If the region had grown at the national rate of 27.54 percent, it would have grown by 1,894,324 jobs, but as the numbers show, the region grew by 3,237,327 jobs between 1970 and 1980.

What was responsible for the greater than average growth in the region? This can be observed by examining the industry mix and local share component. Between 1970 and

1980, employment in the West South Central region grew above average. If employment had expanded at the U.S. industry rate, 104,154 employees would have been added. Of those employees, 1,894,324 could be attributed to growth at the same rate as the nation on the whole and 104,154 of them due to growth in the region throughout the U.S. Because total regional employment in the West South Central region grew by 3,237,327 employees, it can be said that the local area experienced growth at a rate above the national industry rate. For the local share component, it registered a positive 1,238,851 persons. It has already been established that employment in the WSC region grew above average by 1,998,478 persons. But the local share component indicates that some factor has affected the region's positive employment. The result is a very large comparative advantage in the WSC region which allowed growth in the region to outstrip the growth of the industry nationwide and outpace overall growth nationally.

Within manufacturing, total manufacturing employment grew by 534,677 persons between 1970 and 1980. The national share component was 348,474 persons. Regional employment in the manufacturing industry grew at a rate above the national average. The industry mix component was a negative -215,974 number indicating that something happened nationally to



affect employment in manufacturing in this region. The local share component was a positive 402,177 additional employees, and this industry did better locally than it did nationally. The machinery except electrical industry performed better than the other industries in the durable goods category. The total absolute change between 1970 and 1980 was 138,226 persons. If the industry had grown at the U.S. average rate of growth, it would have grown by 27,698 employees.

The remaining industries within the durable goods sectors all had negative industry mixes but positive local share components. This seems to indicate that the growth locally was working to offset the decline in growth nationally for this industry. These industries performed better locally than they did nationally.

Within the service industry, total regional change between 1970 and 1980 was 1,006,244 persons. The industry grew at a rate above the national rate. If it had grown at the national rate, it would have grown by 619,542 additional employees. Both the industry mix and the local share components were positive. This indicates that growth in services grew at rates above the national average, and the region had a comparative advantage in this industry.

Most of the industries within the service industry had positive local share components. These industries were business services, repair services, hospitals, health services, and public administration.

For business service, it grew at a rate above the national average. If it had grown at the national rate, it would have grown by 27,514 employees. Actual growth between 1970 and 1980 totalled 154,384 employees. Most of the growth was due to the industry mix component although the local share component was responsible for an additional comparative advantage of over 44,000 jobs. Health industries and educational industries reflected the same patterns.

The fire, insurance and real estate industries also reflected a similar pattern. Actual growth in this industry between 1970 and 1980 was an increase of 238,679 employees. If it had expanded at the national rate of growth, it would have grown by 90,625 persons. Between 1970 and 1980 employment in the FIRE industry throughout the U.S. grew above average. Once again, if employment had expanded at the U.S. industry rate, 176,553 employees would have been added, with 90,625 employees being attributed to growth at the same rate as the national on the whole and 85,928 of them due to growth in the FIRE industry throughout the U.S. The local

share component indicates that the region also had a comparative advantage in the industry group. Most of the increase could be attributed to the increasing amount of expansion in real estate, insurance, and finance companies located in Texas and Oklahoma. Insurance within the industry group expanded the most between 1970 and 1980.

For the 1981 to 1984 period, the FIRE industry gained only an additional 224 employees. If it had grown at a rate equal to the national average, it would have grown by 24,888 employees. It could be said that this industry from 1981 to 1984 grew at a rate below the national average. Something happened in the local area to offset employment in the local share component by -43,674 persons. The industry did better nationally than it did locally. The net relative change was a loss in jobs of some -24,711 persons. In addition, the FIRE group composed 7.70 percent of total employment in 1981 and only 7.18 percent in 1984. In 1981 this industry had a coefficient of specialization of 1.06 and in 1984 this number had dropped to a coefficient of .96 indicating the region had lost some of its specialization.

The transportation industry had positive for the national share, industry mix, and local share for the 1970 to 1980 period but for the 1981 to 1984 period, the results were different. Between 1981 and 1984 the transportation

industry lost -246,365 jobs or a percent decline of -30.57 percent. In 1981 the transportation industry made up 10.48 percent of total employment. By 1984 this percentage had fallen to 6.77 percent. The coefficients reflect the same patterns with the coefficient 1.70 in 1981 and dropping to 1.13 in 1984. The industry mix and the local share component were both negative reflecting a net relative change of -280,181 persons.

### Occupations

The occupational structure in the West South Central region was indicative of a service-oriented nature [Appendix C-3]. The occupations gaining the largest increase in employees for the 1970 to 1980 period were managers and professional specialty occupations, and sales and clerical workers. In the blue collar occupations, the craftsman occupation experienced the most absolute increase with the operator occupation losing 20,000 jobs. Most of the increase in the professional category was in engineering, health workers, and teachers.

The shift/share analysis for the occupational structure indicated that the region's occupational structure grew above average [Appendix C-4]. The total change for the region was 3,237,326 persons. The national share component

was 1,894,325; the industry mix 74,600; and the local share component of 1,268,400. The net relative change was 1,343,000 additional jobs added to the occupational structure. The occupational categories with all three component positives were the managers and professional occupations, sales occupations, and the service occupations.

The occupations with coefficients greater than one were in farm managers and farm laborers, transportation workers, clerical workers, and other technician occupations.

When earning was examined for this region, it was found that this region had the third highest average weekly earning at \$332 per week; the fifth highest average hourly earning at \$8.02 per hour; and the first highest with the number of hours worked per week. In 1985 this region still had the fifth largest average weekly earning at \$383 and the hourly wage at \$9.32 which was the fifth highest of all nine regions.<sup>44</sup>

## 2. Mountain Region

The Mountain region's population was 9,850,000 in 1974 rising to 11,420,000 in 1980 and then rising to 12 million in 1983.<sup>45</sup> Total persons sixteen years old and over was over

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<sup>44</sup>Ibid.

<sup>45</sup>Ibid.

17 million persons. The Mountain region has 863,000 square miles with population per square mile of 13.3 persons. The most heavily populated states in the region are Montana, Nevada, New Mexico, and Arizona.

The region employment population ratio in 1980 was 58 percent and rose to 61 percent by 1984. The participation rate for this region was 63 percent in 1980 rising to 64 percent by 1984.

The region employed 5,083,008 males and 3,630,898 females between the ages of sixteen and fifty-four years of age. The male participation rate was 48 percent and the female's rate was 34 percent.

Total personal income for the region in 1975 was \$53 million increasing to \$103 million by 1980 and rising to \$134 million by 1983.<sup>46</sup> Per capita income was \$5,444 in 1975 rising to over \$9,000 in 1980 and then to \$11,000 in 1983.<sup>47</sup> The per capita personal income as a percent of the national average was 93 percent in 1975 and rising to 95 percent in 1980, then falling to 93 percent in 1983.

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<sup>46</sup>Ibid.

<sup>47</sup>Susan Shank, "Changes in Regional Unemployment Over the Last Decade," Monthly Labor Review, Vol. 108, No. 3, pp. 17-23.

The Mountain region increased by almost two million persons. This region experienced the largest percentage and absolute increase of all industries. All major industry groups increased over fifty percent. Agricultural employment increased by 13.37 percent, mining 86 percent, construction 90 percent, manufacturing 60 percent, transportation 77 percent, wholesale trade and retail and services over 60 percent, and FIRE increased over 100 percent.

Construction was the only industry to lose employment between 1981 and 1984. Construction composed 6.84 percent of total employment for 1970 and increased this to 7.87 percent in 1980, although the decrease in employment did occur. The percent distribution fell in 1981 to 4.92 percent and fell even further in 1984 to 3.41 percent.

Manufacturing increased 60 percent between 1970 and 1980, and 3.30 percent between 1981 and 1984. For the 1970's decade, the majority of the increase was in durable goods and industries such as machinery, electrical machinery, and motor vehicles. There were no industries that decreased in manufacturing during this period. In the 1981 to 1984 period, manufacturing payroll increased by 26 percent. There were 3,000 new business establishments set up during this period. Manufacturing payroll totalled \$10 million in 1981 and increased to over \$13 million in 1984.

Manufacturing employment as a percent of total employment increased from 12 percent in 1980 to 15 percent in 1981 and 1984.

This region seemed to be exhibiting trends that are supposed to be similar to those of the manufacturing belt.

Services increased the most for this region during the 1970's decade and also during the 1981 to 1984 period. The increase was close to 700,000 persons for the 70's decade and close to 200,000 for the 1981 to 1984 period. Most of the increase were in elementary and secondary institutions or government employment, business services, and hospitals service industries.

The percent distribution jumped from 26 percent in 1981 to 29 percent in 1984.

Most of the increase in the finance, insurance, and real estate industries was in insurance services. Most of the increase in retail trade was in eating and drinking establishments.

This is another region in which all the components of shift/share were positive. What is impressive is the largest positive competitive effect. This indicates that the region had a large number of industries that are performing better locally than in the nation as a whole. The region outgrew the national growth rate by over a



million persons. All major industry groups had all positive components except four: agriculture, construction, manufacturing, and services. These industries had negative industry mixes in which they were quite small indicating only a small significance. The large local share components offset the negative industry mixes. The largest local share component was in manufacturing, followed by FIRE and then services. This is interesting. The region seemed to be gaining a comparative advantage in manufacturing and holding its ground. The large local share components were in the machinery industry groups.

All of the positive industry mixes and the positive local share components indicate a growing region and a strong region for the 1970 to 1980 decade. The region did not change that much for the 1981 to 1984 period. The components overall were positive. The net relative change was 79,000. Similarly the region grew faster than the U.S. as a whole. It had industries locally that were growing faster than some industries nationally.

The largest local share component for this period was in manufacturing followed by construction. The industry with all components of shift/share positive were retail trade, FIRE, and services. The net relative change for services

was over 120,000. The net relative change for manufacturing was a negative 5,000. The industry mix effect for manufacturing contributed to this change.

Overall this region, along with the West South Central region and the Pacific region, performed better than the others.

These regions exhibited trends in industrial employment and in the analysis of shift/share that are indicative of a service-oriented economy that exhibits good employment opportunities and a good industrial base.

In 1980 the base industries, when the coefficient of specialization was used, were agriculture with a coefficient of 1.44, mining 3.15, construction 1.34, transportation 10.5, retail trade 1.08, FIRE 1.03, and services 1.31 [Appendix L]. These industries continued their specialization in these industries for the 1981 to 1984 years.

The occupational structure for this region is one of a professional nature. There were large increases between 1970 and 1980 in the managerial and professional occupations, sales occupations, and clerical occupations. There was also a large increase in the craftsman occupation. In the professional category engineers followed by teachers and physicians increased the greatest in percentage terms.

The occupational categories of private households and operators, and farm managers decreased in employment.

The components of shift/share analysis indicates that the region grew greater than the rate of growth nationally. Total regional growth for occupations was by 193,000 persons. If the growth had been equal to the average growth nationally, the region would have grown by 800,000 persons, and that many occupations would have been created.

The industry mix and the local share component indicate this increase. The net relative change for the IM and the LS component for the region was 116,335 persons employed in the occupational structure.

The region was also specialized in the professions, sales occupations, and specifically within the professional category in the occupations of engineering, administrators, and physicians and health workers. All these occupations had coefficients of specialization greater than one.

Overall this region exhibited a well diversified economy with base industries evenly distributed. The overall regional growth was in goods and the area will probably continue to perform better than the national performance in major industrial groups.

### 3. Pacific Region

The Pacific region's total population was over 31 million in 1980 rising to 33 million by 1983. Personnel sixteen years and older totalled over 24 million persons. The civilian labor force was 15,183,174 and total employed was 14,154,239 persons in 1980. The employment-population ratio in 1980 was 58 percent and the participation rate was 93 percent in 1980. Male and female employment for 1986 was about equal.

The most heavily populated states in the region were California and Washington, Personal income for the region in 1980 was \$384 million and per capita income was \$11,000 in 1980. By 1983 these figures were \$435 million and \$12,000 respectively. As a percent of the national average, the region's percent was 111 in 1983.

The Pacific region employment increased by 4,281,949 persons between 1970 and 1980. This is a percentage increase of 43.38 percent. For the 1981 to 1984 period, employment increased by 671,685 persons or a relative increase of 5.28 percent. The industries with the largest absolute increases were services which increased by 1,538,284 persons, retail trade with increased by 725,805 persons, manufacturing which increased by 689,044 persons, and FIRE which increased by 412,965 persons. The largest

percentage increases were in FIRE followed by construction and services. For 1981 to 1984 the industries with the largest absolute increase were in FIRE and services with a combined total of 852,727 additional jobs. This increase in jobs was offset by a decline in manufacturing and construction of some -408,662 jobs. Manufacturing experienced a decline of 21 percent and construction experienced a decline of 5 percent.

In 1970 manufacturing composed 21 percent of total employment; in 1980 the percent distribution decreased to 19.61 percent, rising again in 1981 to 30 percent and then leveling off at 22 percent in 1984.

Within manufacturing for the 1970 to 1980 period, the durable goods sector gained the most employment adding an additional 509,709 jobs. The industries with the largest increase in employment were machinery except electrical, electrical machinery, and other durables. Fabricated metals industry lost 42,000 employees or a relative decline of -20.76 percent.

In the nondurable goods group, the industries with the largest increases were chemicals followed by printing and publishing industries which combined for a total of 123,48

jobs which represents 59 percent of the increase in non-durables.

The service industry experienced the largest absolute increase of 1,538,284 jobs between 1970 and 1980. This industry's percent distribution in 1970 was 35 percent, rising to 35.32 percent in 1980. In 1981 the percent distribution fell to 25 percent and rose again in 1984 to 25.48 percent.

The industries with the largest gains were business services, educational institutions, and the health industries. These industries accounted for 65 percent of the total change between 1970 and 1980. Services increased by 14 percent between 1981 and 1984.

Retail trade had the largest absolute increase between 1970 and 1980 of 725,805 persons excluding the service industry. The largest increase in this sector was in eating and drinking establishments, which increased by 93 percent or by 331,060 persons.

The FIRE industries had the largest percentage increase between 1970 and 1980 of 72.53 percent. Most of the increase was in insurance industries as the demand for agents, underwriters, and claims increased. FIRE composed

6.94 percent of regional employment in 1980 and this percentage rose to 7.82 in 1984.

Business establishments increased 6.2 percent in the 1970 to 1980 period with large increases occurring in services, retail trade, and the service industries. These same patterns were reflected for the 1981 to 1984 period.

Retail trade and services had the largest increase in business establishments and increases in their payrolls for 1981 to 1984. This reflects similarly the increases that have occurred in employment in these industries. The number of total business establishments increased overall by 22 percent.

There were three industry sectors that increased more than the nation. They were agriculture which increased 28 percent, services with a 27 percent increase, and unclassifiables with a 76 percent increase. The number of total business establishments in 1981 was 699,919. By 1984 the number increased to 857,000. This is an absolute change of 157,084 additional establishments. The largest absolute increase was in services, followed by unclassifiables and retail trade. These three industry groups accounted for 114,582 additional establishments or 72 percent of the total change.

The payroll data reflects the same patterns. The service industry payroll increased from \$39,225,204 in 1981 to \$53,961,630 in 1984. This resulted in a percent change of 37 percent or an absolute change of \$14,736,426. Manufacturing followed services in absolute terms followed by retail and wholesale trade.

The base industries for the 1970 decade were in agriculture (1.17), construction (1.01), transportation (1.06), retail trade (1.02) and wholesale trade (1.15). By 1984 the coefficients were 1.67 for agriculture, and retail trade, services, unclassifiables, and wholesale trade all had coefficients greater than one.

The weekly earnings for this region was \$376 per week rising to \$415 per week by 1985. For 1981 this region was the second highest in weekly earnings and the third highest by 1985. Weekly hourly average was 9.48 in 1981 rising to 10.57 in 1985. This was the highest of all regions in 1981 and the third highest in 1985 following behind the West North Central and East North Central regions.

The shift/share components for the Pacific region indicate a growing region. All components of the technique were positive overall. The region outgrew the national growth rate by 1,563,022 jobs. On an aggregate basis, this region exceeded the national employment growth standard by



the same 1,563,021 employees. The major industries with all three components positive were transportation, wholesale and retail trade, FIRE, and services.

A look at the manufacturing industry indicates that within the durable goods industry two industries grew less than the national average. They were primary metals and fabricated metals. The fabricated metals group had a net relative change of -98,344 persons. Its national expansion rates were less than that of all national industries combined. The local share figure of a negative -36,820 indicates that the region grew or performed worse than the nation in this industry.

In the nondurable goods industries, the food and kindred industries and other nondurable goods group also grew less than the national growth rate.

Overall manufacturing reflected a net relative increase in employment of 114,466 employees. The small increase was because of a negative industry mix of -356,106 persons. This indicates that the manufacturing industry was a rather slow growth industry. Its national expansion rate in employment was less than that of all national industries combined. This trend was even more pronounced during the 1981 to 1984 period. Both the industry mix and the local share component were negative. Also the region grew by way

less than the national average. The net relative change for the 1981 to 1984 period was a negative -812,565.

Transportation reflected a net relative change between 1970 and 1980 of a positive 118,733 persons. Between 1981 and 1984 there was a negative relative change of -21,118 persons. Most of the decrease was due to the industry mix component.

Wholesale trade, retail trade, and FIRE continued their positive growth in all components for the 1970's decade and for the 1981 to 1984 period.

Services was the most noticeable positive employee-gaining industry. Total employment grew by 1,538,284 persons between 1970 and 1980. The trend did slack up between 1981 and 1984 increasing by only 391,245 employees. If employment had expanded at the national rate in the 1970's, it would have expanded by 953,435 employees and by 115,826 persons between 1981 and 1984.

Most of the increase was due to the region having more industries with growth rates expanding greater than all those industries on a national basis. Those industries showing both positive industry mixes and positive share components were business services, elementary and secondary

education, hospitals, and entertainment industries for the 1970 to 1980 period.

The occupational category with the largest absolute increase for the Pacific region was managers and professional occupations followed by sales occupations and service occupations. Sales occupations increased 99 percent between 1970 and 1980.

The largest increase in the professional fields were engineers and health workers. The managers and administrators occupations increased 81 percent which resulted in an absolute increase of 744,007 persons. This region is highly oriented toward white collar employment. Over 80 percent of the change in the occupational structure was in service-oriented occupations.

For the shift-share analysis, all the components were positive in the major occupational category except for the craftsman, operator, and transportation occupations. The industry mix component in these occupations were negative indicating that economic activity nationally affected the regional structure.

The coefficients of specialization for employment seems to reflect this with the region being specialized in those

occupations of managers and professionals, managers and administrators, engineers, and sales occupations.

Overall this region exhibited a diversified economy. Employment was evenly distributed among the major industries groups. There was no one dominant industry in the service or manufacturing fields. The base industries were those that were expanding nationally and probably will continue to do so.

#### 4. South Atlantic Region

The South Atlantic region was 37 million in 1980 and rose to a little of 38 million by 1983. The region has 278,926 square miles and has a population of roughly 138.5 persons per square mile. There were 28,199,794 persons in the region over the age of sixteen and of those 17,270,772 were in the labor force. Employed persons totalled 15,811,450 persons, of which males totalled 9,956,274 and females totalled 10,241,789. Males comprised the largest percent employed between the ages of 16 and 54 years of age.

The employment-population ratio in 1980 was 56 percent in 1980 and the participation rate for the region was 59 percent. The participation rate for males 16-to-54 was 59 percent and 40 percent for females.

Employment increased 37 percent from 1970 to 1980, and 9 percent between the shorter period of 1981 to 1984. Absolute employment increased by four million persons in the region. Employment increased heavily in services, retail trade, and manufacturing. The increase in the service industry employment level was about three times that of manufacturing.

The total changes in employment levels for the health industries and educational institutions were mostly responsible for the change in employment. Public administration employment increased by 34 percent or by close to 300,000 persons. Business services increased by 158 percent, an absolute change of 260,000 persons.

Retail trade increased 52 percent in the region and had the second largest absolute increase in employment change which was a total change of over 700,000 persons. Eating and drinking establishments increased by over 200 percent and had the largest gain in employment change.

Durable goods increased by 33 percent. The industries with the largest increases were machinery except electrical, electrical machinery, and other durables.

Transportation employment increased by 50 percent. The industry categories of other transportation and trucking service combined for 70 percent of total growth.

The percent distribution of total employment by industry showed that all industries increased their percent of distribution from 1970 to 1981 except agriculture, construction, and manufacturing industries. The percent distribution of employment in manufacturing decreased from 24.06 percent in 1970 to 20.73 percent in 1980.

Services increased its percent distribution from 34 percent in 1970 to 36 percent in 1980. This percent distribution fell to 33 percent in 1981, then rose again in 1984 to 35 percent.

The shift/share results for this region indicated a strong local share component and a negative industry mix component. The manufacturing sector was responsible for the negative industrial mix for the region. For manufacturing, the region grew faster than the national rate of growth but the region had industries that were doing better nationally than those same industries locally.

The industries of transportation, wholesale and retail trade, and services all had positive local shares and industry mix components.

Within services, repair service, household help and other personal services all had both negative industry mixes indicating that nationally these industries were experiencing problems that affected this region's employment. Strong local shares were seen in FIRE, services, and manufacturing.

For the 1981 to 1984 period, the region experienced a net relative gain of 564,000 jobs. Only mining and wholesale trade experienced both negative mix effects and local share effects. There were strong negative industry mixes in construction and manufacturing. Overall for this period, the negative mix effects were offset by positive local share effects causing a positive net relative change for the region.

The base industries using the coefficient of specialization were in construction, manufacturing, and transportation for 1980. These same industries had coefficients greater than one in 1984. The only industry within manufacturing to have a coefficient greater than one was in the other durable goods industry. In transportation, the utilities, and communication industries had coefficients greater than one.

In manufacturing, there were a decrease in business establishments of some 64,000, and manufacturing payroll for the 1981 to 1984 period increased only 21 percent. The industries of retail trade, services, and unclassifiables all increased in absolute terms in the number of establishments and in their payrolls. The largest business establishment increase was in retail trade while the largest payroll increase of 4.53 percent was in services.

Personal income for the region rose from \$327 million in 1980 to over \$400 million by 1983. Per capita income rose from \$8,818 in 1980 to \$11,000 in 1983. This as a percent of the national average was 95 percent.

In terms of the average weekly earnings, this region had the second lowest weekly earning of \$297 per week, and the third lowest average hourly earning of \$7.76 in 1981. By 1985 the weekly earnings rose to \$354 and hourly earning rose to \$8.84 which were the fourth lowest and six lowest respectively.

The occupational structure for this region reflected the same patterns as those of the U.S. The occupational categories of professional and managers increased the most between 1970 and 1980 [Appendix F-3]. This occupational group was followed by sales, clerical, and service occupations. The largest absolute increase in the service



occupation was in the food service industry. The occupation to lose the most jobs was in the operator occupations in which over 122,528 jobs were lost. Private household occupation lost 145,955 jobs and resulted in a percentage decrease of -51.29 percent.

The shift/share analysis for occupations showed strong positive local shares in the managers and professional occupations followed by sales occupations, clerical occupations, and craftsman occupations [Appendix F-4]. Large industry mixes were found in other technical workers, operators, and private household occupations. The occupational structure had a net relative change of 1,194,465 jobs within the occupational structure.

Coefficient for managers and professional occupations was 1.00, craftsman 1.02, operators 1.05, and transportation occupations 1.07.

##### 5. East South Central Region

The East South Central region had a population of 23 million persons in 1980 and a little over 25 million by 1983. The most heavily populated state in 1980 and 1983 was Tennessee followed by Alabama and Kentucky.

The region has a total square miles of over 181,000 with population per square mile of 82 persons. Total civilian labor force in 1980 was 6,229,652 persons. The employment-population ratio for 1980 was 53 percent and the participation rate was 57 percent.

Males outnumber females in employment, and the participation rate of males was higher than that of women between the ages of 16 and 54 years.

The East South Central region experienced an increase in employment for both periods. The region's employment increased by over one million employees between 1970 and 1980 [Appendix G]. This was almost a 29 percent increase. Between 1981 and 1984 the increase was three percent or an absolute increase of 124,000 persons.

Services increased by 37 percent. FIRE increased by 63 percent, and retail trade increased by 34 percent between 1970 and 1980. These three industry groups combined for an absolute increase of over 64 percent of the total increase for the 1970's decade. Mining increased by 98 percent but only an absolute increase of 50,000 additional employees.

The industries within services that had the largest increase were hospitals and elementary and secondary educational institutions, namely, government. The only industries to decline were private household and other

personal service industries combining for a total decrease of 75,000 persons between 1970 and 1980. Public administration registered a 46 percent increase and an absolute increase of 45,000 persons.

In the retail trade industry, eating and drinking establishments experienced the largest absolute increase followed by food and bakery industries.

Most of the increase in transportation was in trucking services followed by other transportation industry groups. This industry increased by 82 percent for the 1970's decade.

Overall manufacturing did very well between 1970 and 1980. Employment fell between 1981 and 1984 by only -3.37 percent. During the 1970's decade, fabricated metals fell in employment by only 5,000 persons. This was not significant. The largest increases were in electrical machinery, machinery except electrical, and motor vehicles.

For the 1981 to 1984 period, the region lost employment in mining, construction, manufacturing, and wholesale trade. The loss in wholesale trade was three times as large as the loss in the other three industries combined [Appendix G-1]. Wholesale trade lost over 200,000 employees or a decrease of over 45 percent.

Base industries for this region in 1980 were agriculture (1.18), mining (.67), construction (1.11), manufacturing (1.12) and transportation (1.02). By 1984 the coefficient for mining rose to 1.40 and 1.25 for manufacturing.

Within manufacturing for the 1970's decade, the industry with a specialization variable greater than one was in primary metals. Nondurables had a variable of 1.41 with large coefficients in food and kindred and textile mill products.

The transportation industry had a coefficient of 1.25, and industries within this sector with coefficients greater than one were railroads, trucking services, and other transportation industries.

There was an increase in business establishments during the 1981 to 1984 period of 19 percent [Appendix G-1]. This was an absolute increase of over 48,000 establishments. The largest increases were in services, unclassifiables, and retail trade. Services increased the number of their establishment by adding an additional 17,000, unclassifiables 12,000, and retail trade 9,000. The industries of agriculture, mining, and construction grew the least. There was an increase in manufacturing establishments of only 8 percent.

Payroll data for this region reflects an increase of 21 percent [Appendix G-1]. The actual change was \$12 million. Of this \$12 million increase, service received \$3 million, manufacturing absorbed \$3 million, retail trade acquired close to \$2 million. There were small increases in agriculture, mining, and construction. The largest percentage increase was in unclassifiabes and FIRE, and they only increased in absolute terms by 263,000 and 955,000 respectively.

Personal income in the region was \$109 million in 1980 and \$137 million by 1983. Total per capita income was \$7,431 in 1980 and rose to \$9,174 in 1983. The per capita income as a percent of the national average was 78 percent in 1983 and the same figure for 1980.

This region had the lowest average weekly earning in 1981 and the third lowest in 1985 with weekly earnings of \$277 and \$337 respectively. The average hourly earning for the region was \$6.90 in 1981 and \$8.38 in 1985. An hourly wage of \$6.90 in 1981 was the second lowest and \$8.38 in 1985 was the third lowest, beating only the Mountain region and the New England region.

The results of shift/share for this region indicate a rather positive picture for 1970 to 1980 period and likewise for the 1981 to 1984 period [Appendix G-2]. The negative

industry mix in this region indicates that the region had large numbers of industries locally growing less than all industries nationally. The region grew faster than the rate of growth nationally. The next relative gain for the region was 64,000 persons. The local share component was responsible for the small net relative change.

The industries in which all the components were positive were transportation, wholesale and retail trade, FIRE, and services.

For the 1981 to 1984 period, only mining and wholesale trade had negative industry mixes and local shares. Manufacturing, construction, and transportation had industries that were growing less than those industries nationally. This could be interpreted to mean that the region is waning in these industries.

The net relative change for the 1981 to 1984 period was 406,000 persons. Most of the positive increase is due to the service industry, unclassifiabes, and wholesale trade in which all had both positive industry mixes and local shares.

For the 1970's decade, the manufacturing industries experiencing negative industry mixes were mostly in durable goods. Some of these industries were fabricated metals and primary metals along with machinery except

electrical. Most of the decrease was in other durable goods industries. In the nondurable goods industry, the decreases were in textile mill products and other nondurables.

FIRE, wholesale trade, retail trade, and services all grew at rates above the national growth rate. These industries seemed to be gaining momentum in employment opportunities.

The region registered increases in all major occupational groups except operators and farm managers and laborers [Appendix G-3]. Those occupations declined by 5.01 percent and 20.93 percent respectively. Private household help also declined by 59.47 percent. The largest occupational increases between 1970 and 1980 were those similar to the study that was cited above. These occupations were in sales, clerical, and professional occupations.

The shift/share analysis for occupations indicates that the region had strong competitive effects in managers and professional occupations, sales occupations, clerical occupations, and negative local share in farm labor and service occupations [Appendix G-4]. All occupations grew at rates greater than the national rate except the operator profession. This occupation had an industry mix of over

300,000 employees. The net relative change for the 1970 to 1980 period was a positive 64,000 persons.

The region specialized in the occupational categories that are associated with a blue collar economy. These were craftsman, operator, and transportation workers. Those occupations had coefficients of one or greater.

#### 6. Middle Atlantic Region

The Middle Atlantic region had a total population of over 36 million in 1980 and rose just a little in 1983 to 37 million. The most heavily populated states in the region were New York and Pennsylvania. The area composed 102,203 square miles. Persons sixteen years and older totalled over 28 million. The region had a civilian labor force of 16,894,658 persons, and of those 15,690,571 persons were employed causing an unemployment rate of 7.1 percent in 1980. The employment population ratio and the labor force participation rate were 60 percent and 93 percent respectively.

The Middle Atlantic region experienced an 8.06 percent increase in employment in the decade of the 1970's Appendix H]. There was an absolute increase of 1,170,000 persons. The increase between 1981 and 1984 was a total change of



418,000 persons added to the payroll which is a relative increase of 3.32 percent.

During the 1970's decade, services, FIRE, retail trade, and transportation increased the most in absolute terms. Manufacturing, construction and agriculture experienced declines of 10.19 percent, 10.63 percent, and 1.72 percent respectively.

Business services within the service industry experienced the largest absolute increase of 224,000 persons. Elementary and secondary education, health and hospital industries followed. The industries that lost employment during the 1970 to 1980 period were repair services, household help, and the category of other personal services. During the 1981 to 1984 period, these same industries that experienced an increase in employment during the 1970's also experienced the same pattern for this 1981 to 1984 period. Similarly, manufacturing lost 350,000 jobs during this period.

Industries within manufacturing that fell in employment were mostly in the durable goods sector. They were industries such as primary metals, fabricated metals, machinery except electrical, motor vehicles, and electrical machinery. In the nondurable goods sector the largest employment increases were in chemical and printing and publishing while

the food and kindred industry and the other nondurable goods industries experienced losses.

The basic industries for 1980 were manufacturing, transportation, FIRE, and the service industry. Within manufacturing the industries with coefficients greater than one were primary metals (1.43), machinery except electrical (1.01), electrical machinery (1.10), and other durables (1.20). In the nondurable sector, these industries were printing and publishing, chemicals, and other nondurables.

Most of the industries in transportation exhibited similar patterns with the region showing specialization in other transportation industries and trucking services.

Services had a coefficient of 1.06 and most of the industries within this group had variables greater than one. The exceptions were household services, other personal services, and repair services.

In analyzing establishment data and payroll data, the industries adding the most establishments during the 1981 to 1984 period were services, adding 46,000 establishments, unclassifiabes adding 22,000, retail trade adding 23,000. [Appendix H-1] The industries of unclassifiabes, mining, and services had the largest percentage increases.

For the payroll data, services had a payroll increase three times as large as manufacturing. The industries of FIRE and retail trade and wholesale trade followed.

Personal income for the region was \$375 million in 1980 rising to \$470 million by 1983. Per capita income was \$10,000 in 1980 and \$13,000 by 1983. This represents a per capita income as a percent of the national average of 109 percent in 1983.

The shift/share analysis for the Middle Atlantic region indicates that this region experienced employment declines in its local share component for the 1970 to 1980 period and the 1981 to 1984 period [Appendix H-2]. For the 1970's decade the local share component was negative in most of the major industry groups. The industries with negative share components were mining (-27,837), construction (-267,639), manufacturing (-864,875) and services (-676,719). Something occurred in the local economy to cause such adverse results. Most of the decline occurred in services and the manufacturing industries. The decrease in manufacturing was more severe.

All the major industries within manufacturing had negative competition effects. The net relative change for manufacturing was a negative 1,000,580 persons. Every industry within the durable goods industries that had

negative competitive effects also had negative industry mixes.

The industries of manufacturing and transportation had negative competitive effects for the 1981 to 1984 period. Retail trade and FIRE had positive components for the 1981 to 1984 period. Similarly the net relative change was still a negative 110,000 indicating that the region's local economy was experiencing or had experienced the affects of the 1982-83 recession.

The occupational structure in the Middle Atlantic region indicates a trend toward service occupations. The largest percent increase was in farm labor, followed by sales occupations, and then managers and professionals [Appendix H-3]. The occupations experiencing the largest relative decreases were craftsman (-5.72), operators (-27.26%), and transportation workers (-8.49%). The decrease in the occupations normally associated with manufacturing industries fell during this period of 1970 to 1980. In absolute terms, transportation, operators, and the craftsman occupations combined for a decrease in employment of 714,000 persons.

The shift/share analysis for occupations indicates a negative local share component of 2,830,000 [Appendix H-4]. The total change of 1,170,000 persons was less than the

growth that occurred nationally. If the region's occupational structure had grown at the U.S. rate of growth, occupations would have grown by 4 million persons. It was the loss in occupations in the local economy that caused this less-than-average growth.

Occupations with coefficients greater than one were in the professional and operator occupations. Within the professional group, engineers, health workers, and administrators all had coefficients greater than one.

7. New England, East North Central,  
and North Central Regions

The New England region had a population of 12,367,000 in 1980 rising to 12,489,000 by 1983. The East North Central region's population in 1980 was 41,705,000 and decreased to 41,531,000 by 1983. The West North Central region's population was 17,202,000 in 1980 and hardly rose in 1983 at all.

The civilian labor totalled 6,024,617 in New England, 19,450,303 in East North Central, and 8,094,754 in the West North Central region. Total persons sixteen years and older in the New England region amounted to 9,527,704, in the East North Central to 31,204,110, and in the West North Central to 12,974,383 persons.

The employment population ratio in 1980 was 60 percent for New England, 57 percent for East North Central, and 59 percent in the West North Central region. Similarly the participation rate for New England was 63 percent, East North Central 62 percent, and West North Central 62 percent.

These three regions, normally grouped together and called the manufacturing belt regions, experienced the smallest percentage decrease between 1970 and 1980 and 1981 to 1984. The West North Central region grew by over one million persons in the 1970's decade and by 78,000 persons during the 1981 to 1984 period [Appendix K - K-4]. The East North Central region grew by 15 percent on over two million persons and decreased in employment by almost 50,000 p<sup>1</sup>/<sub>2</sub>persons between 1981 and 1984. [Appendix J - J-4]. The New England region had an absolute increase in employment of 951,000 between 1970 and 1980 and by 300,000 employees between 1981 and 1984 [Appendix I - I-4].

Manufacturing employment in the West North Central region composed 19 percent in 1970 and 1980; this percent distribution fell to 25 percent of total employment in 1981 and fell even further in 1984 to 23 percent.

Services percent distribution of total employment was 31 percent in 1970 rising to 33 percent in 1980 and then

falling in 1981 to 24 percent before rising again in 1984 to 26 percent.

Besides the finance, insurance, and real estate industries, transportation industries and manufacturing industries were the industries with the largest percentage change in employment. Both durable goods and nondurable goods increased modestly. The same patterns were evident for the 1981 to 1984 period with the exception of manufacturing which lost 65,000 jobs and construction which lost 33,000 jobs. Even though manufacturing lost jobs between the 1981 to 1984 period, there were over 1700 establishments added, and the industry payroll increased by 15 percent.

The number of establishments also increased in services by 22 percent, and payroll increased by 32 percent. These patterns were also demonstrated for the unclassifiables industries and retail trade.

The West North Central region also experienced an increase in the managerial and professional occupations, followed by increases in sales occupations and clerical occupations. The only occupations to decline were operators and other technicians occupations.

The East North Central region increased in employment by 15 percent. There were large absolute increases in services, FIRE, retail trade, and wholesale trade. Manufac-

turing was the only major industry to lose employment between 1970 and 1980. This decline was only -9.5 percent. This trend continued for the 1981 to 1984 period decreasing by over 12 percent. In addition to manufacturing, transportation, construction, and mining all decreased in employment between 1981 and 1984.

The percent distribution of employment fell from 35 percent in 1981 to 30 percent in 1984 for manufacturing. For transportation, the distribution fell from 5 percent to close to 4 percent. Construction decreased by close to two percentage points between the latter years.

The industries that were performing well on a national level exhibited good showings in this region. They were in the service-producing sector which includes services, FIRE, retail trade, and wholesale trade. This was true for both study periods.

The New England region exhibited similar patterns to the previous two regions. Those industries such as business services, hospitals and health industries, elementary and secondary educational institutions all increased in employment as a percent of employment distribution for the 1970 to 1980 period.



Manufacturing lost employment but this loss was in the nondurable goods industries and other nondurable goods. In durable goods, the largest absolute gains were in machinery except electrical and electrical machinery.

For the 1981 to 1984 period, this region did better than most of the other regions. There was a total change of over 300,000 persons. Most of this increase was seen in services, retail trade, and nonclassifiables.

Shift/Share Analysis: The shift/share analysis for the East North Central, West North Central, and New England regions all had negative industry mixes and local share components for the 1970 to 1980 period. These same patterns were seen for the 1981 to 1984 period. By far the largest local share component was in the East North Central region followed by New England and then the West North Central. For the three regions, the strong industry mixes were in manufacturing. The industry mixes were heavy in the durable goods sector.

The strong negative industry mixes and the local share component for both periods indicate that the regions are losing out to other regions of the country. This could also be interpreted in such a way that these regions are growing more like the United States. These industries that were

growing nationally, such as services, FIRE, and retail trade, exhibited positive industry mixes.

For the 1981 to 1984 period overall, the components were all positive for the New England region. The net relative change was over 100,000 persons. The West North Central and the East North Central regions continued to show negative local share effects.

The New England, East North Central, and the West North Central regions, the average weekly pay was higher in the East North Central region followed by West North Central and New England. They were \$393, \$334, and \$281 respectively. The East North Central had the highest weekly payroll in 1981 of all the nine regions. The West North Central had the third highest, and the New England had the third lowest. The average hourly earning was \$9.42 in the East North Central, \$8.02 in the West North Central, and \$6.77 in the New England region in 1981. The East North Central had the second highest average hourly earnings followed by West North Central with the fifth highest, and the New England region with the lowest.

In 1985 the West North Central and East North Central still had the highest average weekly and average hourly earnings. The weekly earnings in 1985 for the West North Central region was \$512 and for East North Central region it

was \$460. The average hourly earning was \$12.78 in the West North Central and \$10.55 in the East North Central. New England had the lowest weekly earning of \$298 and the second lowest average hourly earnings of \$8.50.

Personal income and per capita income were as follows: New England, 124,028 in 1980 and 162,664 in 1983; per capita income \$10,024 in 1980 and \$13,024 in 1983; West North Central 158,091 in 1980 and 197,124 in 1983; per capita income \$9.190 in 1980 and \$11,321 in 1983; East North Central 405,168 in 1980 and 478,670 in 1983; per capita income \$9,715 in 1980 and \$11,527 in 1983.

#### D. Changes in Regional Unemployment

Susan Shank analyzed employment and unemployment by region for the 1970 to 1984 period.<sup>48</sup> Some of the results support this paper. The author would like to present an overview of her analysis on unemployment.

In 1976 the highest jobless rates were recorded in the New England, Middle Atlantic, and the Pacific divisions, while the lowest rate occurred in the West North Central division.<sup>49</sup> In 1984 the U.S. unemployment rate at 7.5

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<sup>48</sup>Shank, op. cit., p. 19.

<sup>49</sup>Ibid., p. 20.

percent was close to 7.7 percent rate of 1976, but the geographic distribution differed. In both 1983 and 1984, the highest rates in the nation occurred in the heavily industrialized East South and East North Central divisions and in adjacent states, while New England had the lowest rate. Between the mid 1970's and 1983-84 period, New England shifted from the highest jobless rate division to the lowest; the East South Central division moved from the low unemployment rate category to the highest rate of the nine divisions; and the East North Central states shifted from an average unemployment ranking to next to the highest in both 1983 and 1984.<sup>50</sup>

During the 1976-1979 period, the author found that the national jobless rate dropped from 7.7 to 5.8 percent.<sup>51</sup> Jobless rates fell most in the West and Northeast, while states in the Midwest and East South Central divisions showed the least improvement. Twelve states recorded unemployment rate declines of three percentage points or more. This group comprised four New England states (Connecticut, Massachusetts, New Hampshire and Vermont), two Middle Atlantic states (New York and New Jersey), four

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<sup>50</sup>Ibid.

<sup>51</sup>Ibid.

states in the West (Arizona, California, Hawaii and Nevada) and two in the South Atlantic (Florida and Georgia).<sup>52</sup> New England, which had the highest jobless rate of the nine regions in 1975 (10.2 percent) recorded the largest decrease in the late 1970's as its rate fell to 5.4 percent in 1979.<sup>53</sup> The Pacific and the Middle Atlantic divisions also recorded large unemployment rate decreases between 1976 and 1979.

Jobless rates were unchanged over this period in ten states, and the rate rose in Alaska after construction was completed on the Trans-Alaskan pipeline.<sup>54</sup> The state's jobless rate jumped from about 8 percent in 1976 to 11 percent in 1978 and then declined to 9 percent in 1979.<sup>55</sup> Most of the states where unemployment rates did not improve significantly were in the Midwest and East South Central division. Four states in the heavily agricultural West North Central division (Iowa, Nebraska, North and South Dakota) were in this group because they had low unemployment rates (3 to 4 percent) in both 1976 and 1979.<sup>56</sup>

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<sup>52</sup>Ibid.

<sup>53</sup>Ibid.

<sup>54</sup>Ibid., p. 22.

<sup>55</sup>Ibid.

<sup>56</sup>Ibid.

The five other states where the jobless rate did not decrease between 1976 and 1979 were Alabama, Tennessee, Kentucky, Indiana, and Louisiana. The fact that three of the East South Central states (Alabama, Kentucky, and Tennessee) had virtually the same unemployment rates in 1976 and 1979 meant that this division was the only one where unemployment rates did not drop substantially in the late 1970's.<sup>57</sup>

Between 1979 and 1982, the national unemployment rate jumped 5.8 to 9.7 percent as the economy suffered two successive recessions. In the East North Central states, where automobile manufacturing and supplier industries are concentrated, the unemployment rate jumped from 6.1 percent in 1979 to 9.2 percent in 1980.<sup>58</sup> Sharp unemployment increases occurred in Michigan, Ohio, and Indiana. The rate in the West North Central states also increased. In contrast the unemployment rate in the Northeast rose from 6.6 percent to 7.0 percent between 1979 and 1980, and rates in the South and West both increased about one percentage point.<sup>59</sup>

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<sup>57</sup>Ibid.

<sup>58</sup>Ibid.

<sup>59</sup>Ibid.

Because of the 1981-82 recession and because of the high industrialization of the East North Central region and the East South Central region, jobless rates jumped to 12.5 percent and 12 percent in each region respectively.<sup>60</sup> The rates in the West North Central region doubled. Seven states had 1982 unemployment rates in excess of 11.7 percent -- one-fifth or more above the national average.<sup>61</sup> Five of these states were in the East South Central -- Michigan, Ohio, Indiana, Alabama, and Tennessee.

The lowest rates were recorded in sixteen states which had rates of less than 7.8 percent. Rates were below 7 percent in Kansas, Nebraska, North and South Dakota, Wyoming, Oklahoma, and Texas.

The Northeast, which had the highest unemployment rate of the four regions throughout 1976-79 period was less affected than other parts of the country by the recession of the early 1980's.

The 1983-84 period was one of a robust recovery in the two years following the deep 1981-82 recession. For example, New England posted a drop between 1982 and 1983 while the rate rose in the West South Central states. The

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<sup>60</sup>Ibid.

<sup>61</sup>Ibid.

largest relative improvement occurred in New England, followed by the Mountain division. Four states -- Arizona from the Mountain region, and Rhode Island, Massachusetts and New Hampshire from New England -- experienced large drops. In contrast, the least improvement occurred in the West South Central division, where the jobless rate rose in 1983 and then fell in 1984. Only six states failed to show rate decreases between 1982 and 1984, and two of them -- Louisiana and Oklahoma -- were from the West South Central division. Alaska, Mississippi, Wyoming, and West Virginia were the other four states where jobless rates did not decrease between 1982 and 1984. Jobless rates in the East South and East North Central divisions were still very high.

The New England jobless rate fell from 7.8 percent in 1982 to 4.9 percent in 1984.<sup>62</sup> In both 1983 and 1984, New England had the lowest rate of the nine census divisions. The strong 1983-84 rebound in the New England economy was pervasive.

In the Mountain region, Arizona and Colorado recorded drops in their rates. Wyoming was one of only six states that showed no decreases between 1982 and 1984.

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<sup>62</sup>Ibid.



The jobless rate in the West South Central division worsened in 1983, and rebounded in 1984. The 1983 deterioration contrasted with the national pattern, as well as with the strong expansion in the previous year.

As employment growth slowed, the West South Central jobless rate rose from 7.5 percent in 1982 to 8.9 percent in 1983; it then fell to 7.0 percent in 1984.<sup>63</sup> Oklahoma, where the rate jumped from 5.7 percent to 9.0 percent between 1982 and 1983 and then decreased to 7.0 percent in 1984, was the only state in the nation where the 1984 rate was above the 1982 national rate.<sup>64</sup> Texas jobless rate moved from 6.9 to 8.0 to 5.9 percent over the 1982-84 period.<sup>65</sup> In 1984 Texas returned to the group of states with rates one-fifth or more below the U.S. average. Louisiana, however, proved much less resilient than Texas. Over the 1982-84 period Louisiana jobless rate moved essentially from 10 to 12 percent and back to 10 percent.

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<sup>63</sup>Shank, op. cit.

<sup>64</sup>Ibid.

<sup>65</sup>Ibid.

### E. Employment/Population Ratios

In an article by Susan Shank,<sup>66</sup> she calculated the employment/population for the whole United States and the nine regions. She used data from the Current Population Survey and used annual averages. She compared rates from 1976 to 1983. In the late 1970's she found that employment growth rates exceeded population increases in all nine census divisions. This relationship is measured by the employment/population ratio (the percent of the population 16 years old and over that is employed divided by total civilian population). Between 1979 and 1982 she found no division recorded an employment gain equal to its population increase, so employment and population rates fell until the onset of the 1983 to 1984 recovery.

In the late 1970's, New England and the Pacific states recorded the largest employment-population gains (4 to 4.5 percentage points) while the East South Central and South Atlantic divisions had the smallest (1.5 to 2 percentage points).

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<sup>66</sup>Shank, "Employment Population Ratios," Monthly Labor Review, vol. 108, no. 3, pp. 25-30.

She found when the employment picture weakened in the early 1980's, employment/population ratios fell most in the East North Central states (down 4.3 percentage points) and the adjacent East South Central states (down 3.4 percentage points). The decreases outweighed the gains of the late 1970's in both divisions, the only divisions to do so.

From 1976 to 1983, New England experienced the largest employment/population ratio gain (3.2 percentage points), and substantial increase (2 to 2.5 points) were also posted in the Mountain, Pacific, and West South Central divisions. At the other extreme, the ratios fell about 1.5 percentage points in the East North and East South Central divisions. In the latter division, the ratio was the lowest of the nine divisions in both 1982 and 1983.

## CHAPTER V

### A. Conclusions

The foregoing analyses tried to describe the regional geographical redistribution of employment and to analyze the industrial structure of employment by region. Occupational trends by region were analyzed to depict rising or falling occupations and the occupational shifts from occupation to occupation as demand changes for certain occupations. Regional earnings by average weekly hours and average hourly earnings was also observed to discover in which regions these payments were the highest and the lowest and also in which industries were they higher or lower. Population changes were examined to determine shifts in population from region to region. Similarly, unemployment and the employment population ratio were used to determine the regional population that was employed.

The analysis indicates that a redistribution of employment did occur between 1970 and 1985. This redistribution of employment occurred mostly in the West South Central

region, the Mountain region, the Pacific region, and the South Atlantic region. Employment in these regions comprised almost fifty percent of the total employment change between 1970 and 1980. This percent went over fifty percent for the 1981 to 1984 period for the same regions. What explains this? The author stated that the causes of regional growth were not a concern of this analysis, but one indication that can be drawn is that this growth occurred because of rising job opportunities in these areas. Secondly, new industries have sprung up in these areas to attract people and provide jobs. Similarly, the decrease in manufacturing employment in the East North Central region, Middle Atlantic region, the West North Central region, and the New England region have caused workers to seek employment in other industries. Because these other industries are service oriented, this had resulted in workers moving to the regions where jobs are available. This is not to say that these regions do not have strong service-oriented industries, but that there seem to be more opportunities in the South and Western regions.

The decentralization of manufacturing employment in the East North Central region, West North Central region, and New England region seems to be because the whole United States industrial composition is changing. The shift has

been toward a service economy. The evidence is quite clear and has been for quite some time. The growth industries have been predominantly in the West South Central region, the Pacific region, and the Mountain region. The data indicated that these industries are in finance, insurance, real estate, services, wholesale and retail trade, and even in manufacturing in these regions.

Within services, all the regions saw an increase in business services. This could be because of the occupational demand for accountants, lawyers, counseling services, secretarial services, and other people-oriented services. The rate of increase in these industries has been stronger in the West South Central, Mountain, and Pacific regions.

Industries in the West South Central region, the Pacific region, and the Mountain region exhibited strong employment gains between 1970 and 1980 and 1981 and 1985. These industries were also growing in the manufacturing belt states while these states were losing employment in manufacturing, transportation, and construction.

The shift/share results also seemed to indicate that the East North Central region, the West North Central region, the Middle Atlantic region, and the New England region had a less-than-favorable industrial structure as compared to the other regions. Strong negative industry mixes and local

share were evident in these regions. Something affected these regions' industrial structure nationally, and the local economy could not compensate. The cause of the negative industry mix and local shares in these regions appears to be due to the great loss of manufacturing employment in these regions.

There were large positive industry mix effects and local shares for the West South Central region, Mountain region, Pacific region, and the South Atlantic region. This indicates a strong industrial structure of employment. These regions were performing better on both a national and local level.

When earnings were examined by using quantitative and qualitative data, it is shown that the average hourly wage and the average weekly wage was higher in the East North Central region, the West North Central region, and the Middle Atlantic region. This supports the hypothesis that wages are higher in the North and Eastern states even though these regions have been losing employment in the high wage-paying industries.

Population trends between 1970 and 1983 indicate that the regions of the South and West are still attracting

people. It seems that these regions are the ones with greater employment opportunities.

The coefficient of specialization showed that the basic industries in the West South Central, Mountain, Pacific, and South Atlantic regions are finance, insurance, real estate, and services. All these industries had coefficients greater than one. Conversely, the regions of the East North Central, Middle Atlantic, and West North Central seemed to have as their basic industries manufacturing, transportation, and some service-producing industries. These trends were evident for 1970 to 1980 and 1981 to 1984.

The occupational trends indicate a strong shift toward white collar service-oriented occupations. There were large increases in engineers, computer analysts, lawyers, accountants, and public administrators and managers. Occupations that lost jobs were mainly associated with blue collar occupations. The regions of the North and Eastern states lost the most jobs in this category while the South and West regions had small gains in these jobs but stronger gains in service and professional occupations.



### B. Projected Trends in Employment and Occupational Growth

The employment projections from 1984 to 1995 will continue to increase even though the rate of growth will be slower. According to Valerie Persononick, total employment will reach almost 123 million in 1995, a gain of nearly 16 million jobs from 1984.<sup>1</sup> She projected, using the "middle projection" model of the BLS, that nine out of ten jobs will be added in the service-producing industries -- transportation, communication, public utilities, trade, finance, real estate, and government. The projection of 1228 million in jobs in 1995 translated into growth averaging 1.5 percent per year from 1984 to 1990 and 10 percent during 1990 to 1995.

In her analysis, she found that business services industry is projected to have the most new jobs and the second fastest rate of growth among the 149 industries she studied. Jobs in manufacturing industries are projected to rise by 1.5 million. Employment in manufacturing is to top 21 million by 1995.

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<sup>1</sup>Valeris Persononick, "Employment Projection to 1995," Monthly Labor Review, 1986.

Business services industry is projected to lead all others in numbers of new jobs. Computer and data processing services with legal services, engineering, accounting in the professional category are to continue their growth.

Employment in wholesale and retail trade and in eating and drinking establishments is projected to grow by four million to more than 28 million by 1995. Health care is also another industry in which employment is expected to continue to increase. Cost-containment measures are expected to restrict the expansion of the health care industries over the next decade, and the rate of growth will not be as strong as it was in the previous decade. Hospital employment is projected to grow only 0.7 percent a year through 1995, doctors and dentist services by 2.6 percent, and other medical services by 4.3 percent.

In the service-producing industries, amusement and recreation services are expected to increase along with financial and communication services.

Manufacturing will remain strong in terms of output but job gains will be little as the demand for operators, craftsmen, and heavy equipment machinists slacken. Computers and electronic component industries will continue to

grow, along with machinery and other capital equipment industries.

High technology industries are expected to account for only a small proportion of new jobs through 1995. Employment in high technology industries accounted for 6.1 percent of all wage and salary jobs in 1972, 6.4 percent in 1984, and is expected to represent 7.0 percent by 1995.

Government employment will slow down within the next 15 years. In state and local government, 1.2 million job gain is projected, bringing employment to 14.3 million in 1995. Employment in public education is expected to rise from 6.7 million in 1984 to 7.2 million in 1995, accounting for three out of every seven jobs in state and local governments.

George T. Silvestri and John M. Lukasiuriz analyzed occupational employment projections for the 1984 to 1995 years.<sup>2</sup> They found the fastest growing occupations will be para legal personnel, computer programmers, computer systems analysts, engineers, and technicians. They found that most of the job expansion by 1995 will require college degrees, and they will be very skillful occupations. Health-related

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<sup>2</sup>George T. Silvestri and John M. Lukasiuriz, "Occupational Projections to 1995," Monthly Labor Review, 1986.

and education-related occupations will continue their surge in employment opportunities.

The occupational category of production mechanics and repairs and transportation workers are expected to have slow growth.

The analysis of regional growth and the purpose of this paper was to show how the regions have performed over the 1970 to 1980 and 1981 to 1984 periods with intervening years included. It is hoped that the analysis will provide urban planners, social scientists, and government agencies with a working knowledge of regional economic growth. In implementing job training programs, hopefully the analysis will assist those individuals with their planning.

Overall it seems from the analyses and the qualitative material that the U.S. economy is performing better than the decades of yesterday. Our economy is becoming more service-oriented and less dependent upon manufacturing. It is hoped that we can adjust to this transition in the future as we have in the past. It is hoped that employment opportunities will continue and that the unskilled will become skilled to handle the jobs of the future.

### C. Recommendations

One recommendation that could be made from this study would be that regional planners, urban planners, or private and public individuals concerned with designing programs to enhance employment opportunities need to be aware of the changing nature of the U.S. industrial structure. Our economic base has shifted toward being a service-producing economy, and the occupations that will be in demand will be so oriented.

A recommendation to regional economists and researchers of labor market conditions is that there needs to be further research done on regional growth and change. There is a need for better access to data availability to allow more accurate assessment of employment opportunities.

A final recommendation is to persuade interested individuals to pursue careers that will be open in the future. These opportunities will be in white collar service-oriented occupations.

APPENDIX A  
REGIONAL COMPOSITION

Northeast

New England

Maine  
New Hampshire  
Massachusetts  
Rhode Island  
Connecticut

Middle Atlantic

New York  
New Jersey  
Pennsylvania

North Central

East North Central

Ohio  
Indiana  
Illinois  
Michigan  
Wisconsin

West North Central

Minnesota  
Iowa  
Missouri  
North Dakota  
South Dakota  
Nebraska  
Kansas

South

South Atlantic

Delaware  
Maryland  
Virginia  
West Virginia  
North Carolina  
South Carolina  
Georgia  
Florida  
District of Columbia

East South Central

Kentucky  
Tennessee  
Alabama  
Mississippi

West South Central

Arkansas  
Louisiana  
Oklahoma  
Texas

West

Pacific

Washington  
Oregon  
California  
Alaska  
Hawaii

Mountain

Montana  
Idaho  
Wyoming  
Colorado  
New Mexico  
Arizona  
Utah  
Nevada

## APPENDIX B

## SHIFT/SHARE ANALYSIS

Shift/share analysis is a technique by which employment can be broken down into three components. These components are the national share, industry mix, and local share components.

The national share component is derived by multiplying the employment level in the regional industry in the base year times the percent change in overall U.S. employment.

The industry mix for a local industry is computed by subtracting the percent change in total U.S. employment between the base and terminal year from the percent change in the industry's national employment over the period. Then multiply this industry mix rate times regional employment in that industry in the base year.

The local share estimate is derived by subtracting the percent change in the industry's national employment between the base and terminal years from the percent change in regional employment in the industry, then multiply this regional share rate times the regional employment in that industry in the base year.

Mathematically:

$$n_{ij} = e_{ij} \times r_{on}$$

$$m_{ij} = e_{ij} (r_{in} - r_{on})$$

$$c_{ij} = e_{ij} (r_{ij} - r_{in})$$

where:  $e_{ij}$  = employment in industry  $i$  in region  $j$   
 $r_{on}$  = growth rate of total industry employment  
 $r_{in}$  = growth rate of industry  $i$  for the nation  
 $r_{ij}$  = growth rate of industry  $i$  in region  $j$



## APPENDIX C

INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
THE WEST SOUTH CENTRAL REGION

1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	6,877,502	10,094,829	3,237,327	47.07
Agri. & Forest	346,682	332,028	-14,654	-4.23
Mining	187,336	361,894	174,558	93.18
Construction	522,778	852,704	329,926	63.11
Manufacturing	1,265,163	1,799,840	534,677	42.26
Total Durables	587,981	1,043,457	455,476	77.46
Furniture/ Lumber	89,541	115,617	26,076	29.12
Primary Metals	53,462	90,566	37,104	69.40
Fab. Metals	96,806	127,716	30,910	31.93
Machinery excep Electrical	100,559	238,785	138,226	137.46
Electrical	96,727	173,085	76,358	78.94
Motor Vehicles	135,729	155,334	19,605	14.44
Other Durables	115,157	142,354	27,197	23.62
Total Non- Durables	577,182	756,383	179,201	31.05
Food & Kindred	124,234	155,175	30,941	24.91
Textile Mills	97,423	130,826	33,403	34.29
Print/Publish	73,137	110,405	37,260	50.96
Chemicals	93,705	158,126	64,421	68.75
Other Non- Durables	188,683	201,851	13,168	6.98
Transportation	486,500	777,105	290,605	59.73
Railroads	51,305	56,493	5,188	10.11
Truck Service	102,619	180,101	77,482	75.50
Other transport.	113,141	228,020	114,879	101.54
Communication	84,341	144,569	60,228	71.41
Utilities	135,094	167,922	32,828	24.30

APPENDIX C -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	315,969	504,355	188,386	59.62
Retail Trade	1,174,753	1,663,659	488,906	41.62
Food & Bakery	181,349	277,977	96,628	33.28
Eating/Drinking	200,902	392,249	191,347	95.24
General Merchan.	191,935	230,770	38,835	20.23
Motor Vehicles	197,563	228,300	30,737	15.56
Other Retail	403,004	534,363	131,359	32.59
FIRE	329,023	567,702	238,679	2.54
Banking & CU	109,966	210,877	100,911	91.77
Insurance/Real Estate	219,057	356,825	137,768	62.84
Services	2,249,298	3,255,542	1,006,244	44.73
Business Serv.	99,892	254,276	154,384	154.55
Repair Service	121,499	181,202	59,703	49.14
Priv. Household	161,518	95,330	-65,988	-40.85
Other Personal Services	255,200	245,009	-10,191	-3.99
Entertainment	49,913	76,942	27,029	54.15
Hospitals	219,967	399,074	182,107	83.93
Health Services	140,532	269,851	129,325	92.03
Elem. & Second.	532,682	817,531	284,849	53.47
Other Education	27,085	30,672	3,587	13.24
Welfare/Religious	102,496	206,197	103,001	101.18
Legal	161,880	194,530	37,650	23.26
Public Adminis- tration	376,634	479,722	103,088	27.37

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX C-1

EMPLOYMENT AND COMPONENTS OF CHANGE  
FOR S/S -- 1981-1984  
IN WEST SOUTH CENTRAL REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% OF 1984	COEF. SPEC.
	1981	1984						
Total	7,688,187	8,256,315	7.38	322,904	-11,698	256,819	100.00	1.00
Agriculture	35,083	41,926	17.98	1,473	4,806	28	.46	1.11
Mining	440,849	407,926	-7.47	18,516	-71,638	20,190	5.73	3.11
Construct.	916,816	653,098	-28.76	38,506	-108,459	-193,722	11.92	.36
Manufact.	864,882	1,544,214	78.55	36,325	-83,029	726,068	11.25	1.48
Transpor.	805,811	559,446	-30.57	33,844	-61,805	-218,375	10.48	1.13
Wholesale	646,110	624,696	-3.31	27,137	-11,565	-36,957	8.40	1.09
Retail	1,647,110	1,803,328	9.44	69,203	44,817	41,521	21.43	1.05
FIRE	592,595	592,811	.04	24,888	18,963	-43,674	7.18	.96
Services	1,654,342	1,899,725	14.83	69,482	216,057	40,201	23.00	.88
Unclass.	84,006	129,636	54.31	3,528	40,155	1,941	1.57	1.38

## APPENDIX C-1 (Continued)

TOTAL NUMBER OF BUSINES ESTABLISHMENTS AND PAYROLL DATA\*  
BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
WEST SOUTH CENTRAL REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE	% CHANGE	PAYROLL OF BUS. ESTAB.		TOTAL CHANGE	% CHANGE
	1981	1984			1981	1984		
Total	501,440	618,681	117,241	23.38	124,752,541	146,690,207	21,937,666	17.58
Agriculture	4,852	6,357	1,505	31.02	374,507	519,477	144,970	38.71
Mining	13,336	15,199	1,863	13.97	11,313,692	12,037,851	724,159	6.40
Construct.	44,950	53,998	9,048	20.12	11,931,256	12,289,290	358,034	3.00
Manufact.	27,724	30,829	3,105	10.07	32,581,583	34,236,333	1,654,750	5.07
Transpor.	20,362	23,862	3,500	17.18	11,388,557	13,154,989	1,766,432	15.51
Wholesalew	45,787	51,202	5,415	11.82	12,229,540	13,479,521	1,249,981	10.22
Retail	135,825	158,827	23,002	16.93	15,078,172	18,842,810	3,764,630	24.96
FIRE	41,340	51,645	10,305	25.93	8,083,327	11,842,986	3,759,659	46.51
Services	135,167	174,286	39,119	28.94	20,647,241	28,516,286	7,869,045	38.11
Unclass.	32,142	52,476	20,334	63.26	1,157,807	1,770,665	612,858	52.93

\* All data from County Business Patterns.

## APPENDIX C-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN WEST SOUTH CENTRAL REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	6,877,502	10,114,829	1,894,324	104,154	1,238,851
Agri. & Forest	346,682	332,028	95,489	-105,287	-4,856
Mining	187,336	361,894	51,599	66,420	56,538
Construction	522,778	852,704	143,993	-10,519	196,453
Manufacturing	1,265,163	1,779,840	348,474	-215,974	402,177
Total Durables	587,981	1,043,457	161,952	-74,905	368,429
Furniture/ Lumber	89,541	115,617	24,663	-1,692	3,105
Primary Metals	53,462	90,566	14,725	-10,494	32,873
Fab. Metals	96,806	127,716	26,664	-29,252	33,498
Machinery excep Electrical	100,559	238,785	27,698	11,473	99,055
Electrical	96,727	173,085	26,642	-11,718	61,434
Motor Vehicles	135,729	155,334	37,385	-19,009	1,229
Other Durables	115,157	142,354	31,719	-27,716	23,194
Total Non-Durables	577,182	756,383	158,978	-134,785	155,008
Food & Kindred	124,234	155,175	34,219	21,422	18,145
Textile Mills	97,423	130,826	26,834	-24,040	30,609
Print/Publish	73,137	110,405	20,145	687	16,437
Chemicals	93,705	158,126	25,810	1,205	37,406
Other Non- Durables	188,683	201,851	51,970	-91,494	52,692
Transportation	486,500	777,105	134,000	50,835	105,770
Railroads	51,305	56,493	14,131	-18,891	9,947
Truck Service	102,619	180,101	28,265	15,716	33,501
Other transport	113,141	228,020	31,163	74,979	8,737
Communication	84,341	144,569	23,231	5,615	31,382
Utilities	135,094	167,922	37,210	-27,891	23,509

APPENDIX C-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	315,969	504,355	87,030	22,265	79,091
Retail Trade	1,174,753	1,663,659	323,571	10,172	155,163
Food & Bakery	81,349	277,977	49,950	6,091	40,586
Eating/Drinking	200,902	392,249	55,336	109,089	26,922
General Merchan.	191,935	230,770	52,866	-52,410	38,379
Motor Vehicles	197,563	228,300	54,416	-30,131	6,452
Other Retail	403,004	534,363	111,003	-35,906	56,263
FIRE	329,023	567,702	90,625	85,928	62,126
Banking & CU	109,966	210,877	30,289	48,609	22,013
Insurance/Real Estate	219,057	356,825	60,337	37,072	40,360
Services	2,249,498	3,255,542	619,542	200,314	186,389
Business Serv.	99,892	254,276	27,514	82,825	44,045
Repair Service	121,499	181,202	33,465	-5,068	31,306
Priv. Household	161,518	95,530	44,488	-105,387	-5,089
Other Personal Services	255,200	245,009	70,292	-74,130	-6,353
Entertainment	49,913	76,942	13,748	15,975	-2,694
Hospitals	219,967	399,074	59,761	80,179	42,167
Health Services	140,532	269,857	38,708	75,910	14,707
Elem. & Second.	532,682	817,531	146,721	54,704	83,424
Other Education	27,085	30,672	7,460	-4,961	1,088
Welfare/Relig.	102,496	206,197	28,231	55,680	19,790
Legal	161,880	199,530	44,588	-35,104	28,166
Public Adminis- tration	376,634	479,722	103,739	18,957	18,306

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX C-3 and 4

OCCUPATION OF EMPLOYED PERSONS AND  
COMPONENTS OF CHANGE FOR S/S

1970-1980

West South Central Region

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
	Region Total	6,877,503	10,114,829	1,894,325	74,600	1,268,400	3,237,326
Manage/Prof.	1,574,948	2,453,833	433,800	225,123	219,962	878,885	55.80
Mgrs & Adminis.	617,490	1,010,136	170,080	194,571	27,995	392,646	63.59
Prof. Special	957,458	1,443,697	263,720	44,321	178,198	486,39	50.78
Engineers	96,492	213,620	26,578	48,793	41,767	117,128	121.39
Physicians	42,960	53,986	11,833	3,462	-2,656	11,026	25.67
Health Workers	95,559	135,254	26,321	12,592	783	39,695	41.54
Teachers	237,740	481,430	65,483	134,337	43,871	243,690	102.50
Other Tech.	487,707	559,407	134,333	-136,228	73,595	71,700	14.70
Sales Occupa.	510,472	1,089,551	140,603	264,288	174,248	579,079	113.44
Clerical	1,144,311	1,672,174	315,187	-56,585	269,261	527,863	46.13
Craftsmen	979,869	1,530,939	269,893	-86,430	367,607	551,070	56.24
Operators	794,318	774,142	218,785	-325,571	86,610	-20,176	-2.54
Transportation	289,229	394,321	79,665	-47,272	72,699	105,092	36.34
Laborers	347,947	639,385	95,838	113,201	82,399	291,438	83.76
EM Mgr & Lab	292,328	321,743	80,518	27,482	-23,421	29,615	10.13
Farm Manager	153,522	148,604	42,286	-55,998	8,795	-4,918	-3.20
Farm Laborer	138,806	173,339	38,232	43,157	-46,856	34,533	24.88
Serv. Occupa.	944,081	1,238,541	260,036	15,388	19,036	294,460	31.19
Cleaning Occ.	165,938	275,993	45,706	33,087	31,26	110,055	66.23
Food	244,453	403,274	67,332	74,688	16,801	158,821	64.97
Protective	72,829	132,853	20,060	19,946	20,018	60,024	82.42
Other	295,799	347,994	81,474	-42,841	13,562	52,195	17.65
Private Hse	165,062	78,428	45,464	-126,089	-6,009	-86,634	-52.49

\*Component calculated by formula in Appendix B.

APPENDIX D  
INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
THE MOUNTAIN REGION  
1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	2,964,487	4,897,354	1,932,867	65.02
Agri. & Forest	175,614	199,093	23,479	13.37
Mining	87,238	162,257	75,019	85.99
Construction	202,863	385,473	182,610	90.02
Manufacturing	373,138	596,816	223,678	59.95
Total Durables	231,139	402,159	171,020	73.99
Furniture/ Lumber	29,504	44,997	15,493	52.51
Primary Metals	31,294	39,100	7,806	24.94
Fab. Metals	26,032	35,903	9,871	37.92
Machinery excep Electrical	35,818	81,570	45,752	127.73
Electrical	44,613	73,143	28,530	63.95
Motor Vehicles	23,644	47,514	23,870	100.96
Other Durables	40,234	79,932	39,698	98.67
Total Non- Durables	141,999	194,657	52,658	37.08
Food & Kindred	49,343	61,118	11,775	23.86
Textile Mills	15,490	24,359	8,869	57.26
Print/Publish	31,868	57,615	25,747	80.79
Chemicals	12,747	19,989	7,242	56.81
Other Non- Durables	32,551	31,576	-975	-3.00
Transportation	209,650	372,205	162,555	77.54
Railroads	37,419	39,312	1,893	5.06
Truck Service	40,361	75,241	34,880	86.42
Other transport.	33,487	95,776	62,289	186.01
Communication	42,937	76,670	33,733	78.56
Utilities	55,446	82,206	26,760	48.26



APPENDIX D -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	118,946	198,624	79,578	66.99
Retail Trade	523,550	851,287	327,737	62.60
Food & Bakery	70,535	124,969	54,434	77.17
Eating/Drinking	115,454	245,521	130,067	112.66
General Merchan.	74,124	91,199	17,075	23.04
Motor Vehicles	86,854	112,192	25,338	29.17
Other Retail	176,583	277,406	100,823	57.10
FIRE	142,811	304,347	161,536	113.11
Banking & CU	51,394	113,591	62,197	121.02
Insurance/Real Estate	91,417	190,756	99,339	108.67
Services	1,130,677	1,827,252	696,575	61.61
Business Serv.	56,767	146,218	89,451	157.58
Repair Service	49,885	79,503	29,618	59.37
Priv. Household	34,586	24,772	-9,814	-28.38
Other Personal Services	138,600	201,473	62,873	45.36
Entertainment	41,439	85,706	44,267	106.82
Hospitals	101.84	181,516	79,676	78.24
Health Services	62,562	125,941	63,379	101.31
Elem. & Second.	281,680	429,344	147,664	52.42
Other Education	15,915	17,355	1,440	9.05
Welfare/Religious	46,924	98,252	51,328	109.39
Legal	80,164	110,863	30,699	38.30
Public Adminis- tration	220,315	326,309	105,994	48.11

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX D-1

EMPLOYMENT AND COMPONENTS OF CHANGE  
FOR S/S -- 1981-1984  
IN THE MOUNTAIN REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF. SPEC.
	1981	1984						
Total	3,603,652	3,862,363	7.18	151,353	35,649	71,709	100.00	1.00
Agriculture	20,471	21,881	6.90	859	2,805	-2,252	.57	1.24
Mining	177,423	131,730	-25.75	7,452	-28,831	-24,307	3.41	2.78
Construct.	286,595	304,346	6.19	12,037	-33,904	39,607	7.87	1.47
Manufact.	564,872	553,520	3.30	23,725	-54,228	49,144	15.10	.61
Transport.	244,054	249,791	2.35	10,250	-18,719	14,204	6.47	1.07
Wholesale	249,032	251,154	.85	10,459	-4,457	-3,885	6.50	.94
Retail	825,294	890,296	7.88	34,662	22,448	7,923	23.05	1.11
FIRE	245,935	267,743	8.87	10,329	7,869	3,615	6.93	.94
Services	951,474	1,108,775	17.74	39,962	124,262	4,567	28.71	1.10
Unclass.	38,502	53,127	37.98	1,617	18,404	-5,398	1.37	1.20

## APPENDIX D-1 (Continued)

TOTAL NUMBER OF BUSINESS ESTABLISHMENTS AND PAYROLL DATA\*  
BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
MOUNTAIN REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE	% CHANGE	PAYROLL OF BUS. ESTAB.		TOTAL CHANGE	% CHANGE
	1981	1984			1981	1984		
Total	254,960	322,342	67,382	26.42	52,545,714	65,236,372	2,690,657	24.15
Agriculture	2,803	3,852	1,049	37.42	224,305	248,295	23,990	10.70
Mining	4,265	4,576	311	7.29	4,510,512	3,888,002	-622,510	-13.80
Construct.	26,520	32,329	5,793	21.83	5,172,759	6,096,014	923,255	17.85
Manufact.	12,520	15,915	3,395	27.12	10,546,771	13,248,420	2,701,649	25.62
Transpor.	8,916	11,252	2,336	26.20	4,090,639	5,947,243	1,856,604	45.39
Wholesale	20,074	22,920	2,846	14.18	4,261,639	4,990,228	728,798	17.10
Retail	66,629	78,884	12,255	18.39	7,208,689	8,996,166	1,787,477	24.80
FIRE	24,301	29,228	4,927	20.27	3,638,587	4,910,690	1,272,103	35.00
Services	73,836	96,878	23,042	31.21	11,643,209	15,925,228	4,282,019	36.77
Unclass.	15,060	27,508	12,448	82.66	412,981	986,086	573,105	138.77

\* All data from County Business Patterns.

## APPENDIX D-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN MOUNTAIN REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	2,964,487	4,897,354	816,532	80,053	1,036,282
Agri. & Forest	175,614	199,093	48,371	-53,334	28,442
Mining	87,238	162,257	24,029	30,930	20,060
Construction	202,863	385,473	55,876	-4,082	130,816
Manufacturing	373,138	596,816	102,776	-63,698	184,599
Total Durables	231,139	402,159	63,664	-29,446	136,801
Furniture/ Lumber	29,504	44,997	8,127	-557	7,924
Primary Metals	31,294	39,100	8,620	-6,143	5,329
Fab. Metals	26,032	35,903	7,170	-7,866	10,567
Machinery excep Electrical	35,818	81,570	9,866	4,087	31,800
Electrical	44,613	73,143	12,288	-5,405	21,647
Motor Vehicles	23,644	47,514	6,512	-3,311	20,669
Other Durables	40,234	79,932	11,082	-9,683	38,3300
Total Non-Durables	141,999	194,657	39,112	-33,160	46,706
Food & Kindred	49,343	61,118	13,591	-8,508	6,693
Textile Mills	15,490	24,359	4,267	3,822	8,425
Print/Publish	31,868	57,615	8,77	299	16,670
Chemicals	12,747	19,989	3,511	164	3,567
Other Non- Durables	32,551	31,576	8,966	15,784	5,844
Transportation	209,650	372,205	57,746	21,907	82,903
Railroads	37,419	39,312	10,307	-13,778	5,364
Truck Service	40,361	75,241	11,117	6,181	17,58
Other transport	33,487	95,776	9,224	22,192	30,873
Communication	42,937	76,670	11,826	2,858	19,048
Utilities	55,446	82,206	15,272	-11,447	22,935

APPENDIX D-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	118,946	198,624	32,762	8,382	38,534
Retail Trade	523,550	851,287	144,205	4,533	178,998
Food & Bakery	70,535	124,969	19,428	2,369	32,637
Eating/Drinking	115,454	245,521	31,800	62,691	35,575
General Merchan.	74,24	91,199	20,417	-20,240	16,899
Motor Vehicles	86,854	112,192	23,923	-13,246	14,661
Other Retail	176,583	277,406	48,638	15,733	67,918
FIRE, Banking & CU	142,811 51,394	304,367 113,591	39,336 14,156	37,297 22,718	84,904 25,323
Insurance/Real Estate	91,417	190,756	25,180	15,471	58,689
Services	1,130,677	1,827,252	953,435	308,271	276,577
Business Serv.	56,767	146,218	15,636	47,068	26,747
Repair Service	49,885	79,503	13,740	-2,081	17,959
Priv. Household	34,586	24,772	9,526	-22,567	3,226
Other Personal Services	138,600	201,473	38,176	-40,260	64,958
Entertainment	41,439	85,706	11,414	13,263	19,590
Hospitals	101,840	181,516	28,051	37,634	13,991
Health Services	62,562	125,941	17,232	33,794	12,353
Elem. & Second.	281,680	429,344	77,585	28,927	41,152
Other Education	15,915	17,355	4,384	-2,915	-29
Welfare/Relig.	46,924	98,52	12,925	25,491	12,912
Legal	80,164	110,863	22,080	-17,384	26,003
Public Adminis- tration	220,315	326,309	60,683	11,089	56,400

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX D-3 and 4

OCCUPATION OF EMPLOYED PERSONS\* AND  
COMPONENTS OF CHANGE FOR S/S

1970-1980

Mountain Region

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
Region Total	2,964,487	4,897,354	816,532	72,650	1,043,685	1,932,867	65.20
Manage/Prof.	781,185	1,340,665	215,168	111,662	232,650	559,480	71.62
Mgrs & Adminis.	287,598	552,096	79,215	90,622	94,661	264,498	91.97
Prof. Special	493,587	788,569	135,953	22,848	136,181	294,982	59.76
Engineers	48,301	125,460	13,304	24,424	39,431	77,159	159.75
Physicians	21,907	32,120	6,034	-1,766	5,945	10,213	46.62
Health Workers	48,815	79,774	13,445	6,432	11,081	30,959	63.42
Teachers	113,148	248,598	31,165	63,935	40,350	135,450	119.71
Other Tech.	261,416	302,617	72,004	-73,020	42,217	41,201	15.76
Sales Occupa.	208,927	524,469	57,546	108,144	149,852	315,542	151.03
Clerical	503,951	792,167	138,807	-24,920	174,329	288,216	57.19
Craftsmen	393,672	680,086	108,432	-34,724	212,706	286,414	72.75
Operators	257,257	249,145	70,858	-105,443	26,473	-8,112	-3.15
Transportation	111,397	167,635	30,683	-18,207	43,762	56,238	50.48
Laborers	131,916	268,040	36,335	42,918	56,872	136,124	103.19
EM Mgr & Lab	146,599	178,415	40,379	-13,782	5,219	31,816	21.70
Farm Manager	81,908	77,670	22,561	-29,877	3,078	-4,238	-5.17
Farm Laborer	64,691	100,745	17,818	20,113	-1,878	36,054	55.73
Serv. Occupa.	429,583	696,732	118,323	7,002	141,824	267,149	62.19
Cleaning Occ.	83,539	152,580	23,010	16,657	29,374	69,041	82.65
Food	145,754	271,362	40,146	44,533	40,929	125,608	86.18
Protective	33,247	72,980	9,157	9,106	21,470	39,733	119.51
Other	132,762	179,687	36,568	-19,228	29,586	46,925	35.35
Private Hse	34,281	20,123	9,442	-26,187	2,587	-14,158	-41.30

\*Component calculated by formula in Appendix B.

APPENDIX E  
INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
THE PACIFIC REGION  
1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	9,871,290	14,153,239	4,281,949	43.38
Agri. & Forest	346,042	469,809	123,767	35.77
Mining	40,569	53,813	13,244	32.65
Construction	560,212	840,483	280,271	50.03
Manufacturing	2,086,051	2,775,095	689,044	33.03
Total Durables	1,431,343	1,941,052	509,709	35.61
Furniture/ Lumber	183,588	241,748	58,160	31.68
Primary Metals	75,162	91,728	16,566	22.04
Fab. Metals	203,608	161,346	-42,262	-20.76
Machinery excep Electrical	168,105	295,607	127,502	75.85
Electrical	222,671	357,464	134,793	60.53
Motor Vehicles	366,425	499,509	133,084	36.32
Other Durables	211,784	293,650	81,866	38.66
Total Non- Durables	654,708	834,043	179,335	27.39
Food & Kindred	178,411	219,511	41,100	23.04
Textile Mills	89,768	145,832	56,064	62.45
Print/Publish	131,080	198,494	67,414	51.43
Chemicals	64,987	97,904	32,917	50.65
Other Non- Durables	190,462	172,302	-18,160	-9.53
Transportation	717,205	1,033,483	316,278	44.10
Railroads	63,945	54,222	-9,723	-15.21
Truck Service	128,218	201,851	73,633	57.43
Other transport.	188,055	371,687	183,632	97.65
Communication	170,722	239,204	68,482	40.11
Utilities	166,265	166,519	254	0.15

APPENDIX E -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	445,907	628,198	182,291	40.88
Retail Trade	1,644,370	2,370,175	725,805	44.14
Food & Bakery	233,125	342,620	109,495	46.97
Eating/Drinking	357,560	688,620	331,060	92.59
General Merchan.	265,047	300,933	35,886	13.54
Motor Vehicles	23,447	272,081	36,634	15.56
Other Retail	553,191	765,921	212,730	38.46
FIRE	569,406	982,371	412,965	72.53
Banking & CU	189,574	361,631	172,057	90.76
Insurance/Real Estate	379,832	620,740	240,908	63.42
Services	3,461,528	4,999,812	1,528,284	44.43
Business Serv.	225,343	499,668	274,325	121.74
Repair Service	164,605	224,265	59,660	36.24
Priv. Household	123,650	101,813	-21,837	-17.66
Other Personal Services	326,950	369,502	42,552	13.01
Entertainment	129,718	212,446	82,728	63.78
Hospitals	333,064	586,735	253,671	76.16
Health Services	236,983	392,456	155,473	65.61
Elem. & Second.	782,658	1,105,502	322,844	41.25
Other Education	48,486	53,893	5,407	11.15
Welfare/Religious	159,391	324,906	165,515	103.84
Legal	291,300	372,104	80,804	27.74
Public Adminis- tration	639,380	765,522	117,142	18.32

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data



APPENDIX E-1  
 EMPLOYMENT AND COMPONENTS OF CHANGE  
 FOR S/S -- 1981-1984  
 IN THE PACIFIC REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF. SPEC.
	1981	1984						
Total	10,824,848	11,496,533	5.28	454,644	37,070	180,052	100.00	1.00
Agriculture	76,873	86,540	12.56	3,229	10,532	4,105	.75	1.67
Mining	63,913	77,363	21.04	2,684	-10,386	21,149	.67	.54
Construct.	645,745	613,631	-4.97	27,121	-76,392	17,177	5.34	.99
Manufact.	3,239,895	2,563,347	-20.88	136,075	311,029	-501,536	22.29	.89
Transpor.	701,592	709,995	1.19	29,467	-53,812	32,694	6.17	1.02
Wholesale	533,852	806,023	50.98	22,412	-9,556	259,292	7.01	1.01
Retail	2,258,174	2,431,915	7.69	94,843	61,422	17,388	21.15	1.01
FIRE	438,011	899,493	105.35	18,396	14,016	429,070	7.82	1.05
Services	2,757,776	3,146,021	14.20	115,826	360,165	-84,387	27.36	1.05
Unclass.	109,017	162,205	48.78	4,578	52,110	3,510	1.41	1.23

## APPENDIX E-1 (Continued)

TOTAL NUMBER OF BUSINESS ESTABLISHMENTS AND PAYROLL DATA\*  
BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
PACIFIC REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE	% CHANGE	PAYROLL OF BUS. ESTAB.		TOTAL CHANGE	% CHANGE
	1981	1984			1981	1984		
Total	699,919	857,003	157,084	22.44	178,870,182	222,907,231	44,037,049	24.62
Agriculture	9,153	11,742	2,589	28.29	928,531	1,143,884	215,353	23.19
Mining	1,813	2,145	332	.30	1,939,470	2,213,187	273,717	14.11
Construct.	56,443	67,357	10,614	18.71	14,278,116	15,406,425	1,128,309	7.90
Manufact.	53,443	60,253	6,810	12.74	53,181,401	62,623,568	9,442,167	17.75
Transpor.	24,799	29,347	4,548	18.34	15,999,789	19,083,785	3,083,996	19.27
Wholesale	53,300	62,021	8,769	16.47	13,384,319	19,130,079	5,745,760	42.93
Retail	173,300	199,620	26,320	15.19	22,868,949	28,281,606	5,412,657	23.67
FIRE	69,364	78,150	8,786	12.67	14,303,977	18,530,980	4,227,003	29.55
Services	218,851	277,363	58,512	26.74	39,225,204	53,961,630	14,736,426	37.57
Unclass.	39,255	69,005	29,750	75.78	1,477,477	2,532,087	1,054,610	71.38

\* All data from County Business Patterns.

## APPENDIX E-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN THE PACIFIC REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	9,871,290	14,153,239	2,718,927	119,490	1,443,531
Agri. & Forest	346,042	469,809	95,313	-105,093	133,546
Mining	40,569	53,813	11,174	14,384	-12,314
Construction	560,212	840,483	154,304	-11,273	137,240
Manufacturing	2,086,051	2,775,095	574,577	-356,106	470,572
Total Durables	1,431,343	1,941,052	394,246	-182,343	297,806
Furniture/ Lumber	183,588	241,748	50,567	-3,469	11,062
Primary Metals	75,162	91,728	20,702	-14,753	10,617
Fab. Metals	203,608	161,346	56,081	-61,524	-36,820
Machinery excep Electrical	168,105	295,607	46,302	19,180	62,020
Electrical	222,671	357,464	61,332	-26,976	100,437
Motor Vehicles	366,425	499,509	100,927	-51,319	83,476
Other Durables	211,784	293,650	58,333	-50,972	74,505
Total Non-Durables	654,708	834,043	180,331	-152,889	-151,893
Food & Kindred	178,411	219,511	49,141	-30,764	22,723
Textile Mills	89,768	145,832	24,726	-22,151	53,490
Print/Publish	131,080	198,494	36,104	1,231	30,079
Chemicals	64,987	97,904	17,900	835	14,18
Other Non- Durables	190,462	172,302	52,460	-92,357	2,736
Transportation	717,205	1,033,483	197,545	74,942	43,791
Railroads	63,945	54,222	17,613	-23,545	-3,791
Truck Service	128,218	201,851	35,316	19,636	18,681
Other transport	188,055	371,687	51,797	124,625	7,210
Communication	170,722	239,204	47,023	11,366	10,093
Utilities	166,265	166,519	45,796	-34,326	-11,215

APPENDIX E-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	445,907	628,198	122,820	31,421	28,050
Retail Trade	1,644,370	2,370,175	452,922	14,238	258,646
Food & Bakery	233,125	342,620	64,211	7,830	37,453
Eating/Drinking	357,560	688,620	98,486	194,154	38,421
General Merchan.	265,047	300,933	73,004	-72,374	35,256
Motor Vehicles	235,447	272,081	64,851	-35,909	7,692
Other Retail	553,191	765,921	152,370	-49,288	109,648
FIRE, Banking & CU	568,406	982,371	156,836	148,706	107,423
Insurance/Real Estate	189,574	361,631	52,216	83,799	36,043
	379,832	620,740	104,620	64,280	72,008
Services	3,461,528	4,999,812	953,935	308,271	276,577
Business Serv.	225,343	499,668	62,068	486,843	25,414
Repair Service	164,605	224,265	45,338	-6,866	21,188
Priv. Household	123,650	101,813	34,058	-80,679	24,784
Other Personal Services	326,950	369,502	90,954	-94,972	47,784
Entertainment	129,718	212,446	35,729	41,518	5,481
Hospitals	333,064	586,735	91,738	123,082	38,850
Health Services	236,983	392,456	65,274	128,009	37,810
Elem. & Second.	782,658	1,105,502	215,574	80,375	26,895
Other Education	48,486	53,893	13,355	-8,881	933
Welfare/Relig.	159,391	324,906	43,902	86,588	63,739
Legal	291,300	372,104	80,235	-63,170	63,739
Public Adminis- tration	639,380	756,522	176,109	-32,182	-26,786

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

APPENDIX E-3 and 4  
OCCUPATION OF EMPLOYED PERSONS\* AND  
COMPONENTS OF CHANGE FOR S/S  
PACIFIC REGION  
1970-1980

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
Region Total	9,871,290	14,153,239	2,718,928	236,938	1,326,043	4,281,949	43.38
Manage/Prof.	2,604,893	3,972,549	717,486	372,343	277,827	1,367,656	52.50
Mgrs & Adminis.	920,099	1,664,106	253,430	289,923	200,654	744,007	80.86
Prof. Special	1,684,794	2,308,43	464,056	77,990	81,63	623,649	37.02
Engineers	222,310	405,326	61,233	112,416	9,367	183,016	82.32
Physicians	79,137	105,934	21,797	-6,378	11,378	26,797	33.86
Health Workers	166,850	231,623	45,957	21,986	-3,170	64,773	38.82
Teachers	325,163	620,740	89,562	183,736	22,279	295,577	90.90
Other Tech.	891,334	944,820	245,507	-248,971	56,949	53,486	6.00
Sales Occupa.	769,867	1,528,625	212,051	398,495	148,213	758,758	98.56
Clerical	1,892,955	2,548,109	521,392	-93,604	227,367	655,154	34.61
Craftsmen	1,308,143	1,771,709	360,312	-115,385	218,639	463,566	35.44
Operators	999,072	965,981	275,182	-409,495	101,222	-33,091	-3.31
Transportation	344,331	416,839	94,842	-56,278	33,944	72,508	21.06
Laborers	440,009	688,440	121,195	143,153	-15,917	248,431	56.46
EM Mgr & Lab	244,180	440,418	67,256	-22,956	151,937	196,238	80.37
Farm Manager	82,089	91,074	22,610	-29,943	16,317	8,985	10.95
Farm Laborer	162,091	349,344	44,646	50,396	92,211	187,253	115.52
Serv. Occupa.	1,267,840	1,820,529	349,211	20,666	182,812	552,689	43.59
Cleaning Occ.	227,288	359,904	62,604	45,320	24,692	132,616	58.35
Food	395,052	671,037	108,812	120,701	46,472	275,985	69.86
Protective	125,410	206,053	34,543	34,347	11,753	80,643	64.30
Other	403,708	501,975	111,197	-58,470	45,540	98,267	24.34
Private Hse	116,382	81,560	32,056	-88,903	22,025	-34,822	-29.92

\*Component calculated by formula in Appendix B.

## APPENDIX F

 INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
 THE SOUTH ATLANTIC REGION  
 1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total	1,146,523	15,811,450	4,350,927	37.96
Agri. & Forest	435,655	441,430	5,775	1.33
Mining	91,421	129,922	38,501	42.11
Construction	828,808	1,118,291	29,483	34.93
Manufacturing	2,756,988	3,278,350	521,362	18.91
Total Durables	1,002,474	1,474,724	362,250	32.56
Furniture/ Lumber	233,149	290,953	57,804	24.79
Primary Metals	85,361	112,872	27,511	32.23
Fab. Metals	116,086	123,127	7,041	6.07
Machinery excep Electrical	113,978	219,363	105,385	92.46
Electrical	168,278	258,341	90,063	53.52
Motor Vehicles	188,525	213,821	25,296	13.42
Other Durables	207,097	256,247	49,150	23.73
Total Non- Durables	1,654,514	1,803,626	149,112	9.01
Food & Kindred	184,684	211,402	26,718	14.47
Textile Mills	833,367	909,922	76,555	9.19
Print/Publish	134,551	197,998	63,447	47.15
Chemicals	179,436	218,218	38,782	21.61
Other Non- Durables	322,476	266,086	-56,390	-17.49
Transportation	763,100	1,138,116	375,016	49.14
Railroads	85,641	79,089	-6,372	-7.46
Truck Service	150,661	239,648	88,987	59.06
Other transport.	172,153	344,149	171,996	99.91
Communication	164,637	246,057	81,420	49.45
Utilities	190,008	229,173	39,165	20.61

APPENDIX F -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	434,758	631,538	196,780	45.26
Retail Trade	1,779,817	2,524,162	744,345	41.82
Food & Bakery	278,339	421,931	143,592	51.59
Eating/Drinking	290,770	633,093	423,323	201.80
General Merchan.	308,245	331,197	22,952	7.45
Motor Vehicles	275,105	326,539	51,434	18.70
Other Retail	627,358	811,402	184,044	29.34
FIRE	520,759	904,511	383,752	73.69
Banking & CU	177,003	343,142	166,139	93.86
Insurance/Real Estate	343,756	561,396	217,613	63.30
Services	3,849,217	5,645,130	1,795,913	46.66
Business Serv.	166,504	431,035	264,531	158.87
Repair Service	163,092	209,187	46,095	28.26
Priv. Household	271,000	159,976	-111,024	-40.97
Other Personal Services	414,225	431,124	16,899	4.08
Entertainment	90,448	169,980	79,532	87.93
Hospitals	355,870	685,404	329,534	92.60
Health Services	206,419	395,241	188,822	91.48
Elem. & Second.	817,465	1,262,249	444,784	54.41
Other Education	48,647	55,977	7,330	15.07
Welfare/Religious	168,339	325,637	157,298	93.44
Legal	277,621	351,376	73,755	26.57
Public Adminis- tration	869,587	1,167,944	298,357	34.31

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX F-1

EMPLOYMENT AND COMPONENTS OF CHANGE  
FOR S/S -- 1981-1984  
IN SOUTH ATLANTIC REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF.	
	1981	1984						SPEC.	SPEC.
Total	11,713,633	12,768,359	9.00	491,973	16,611	548,150	100.00	1.00	
Agriculture	60,486	69,630	15.12	2,540	8,287	-1,682	.55	1.20	
Mining	123,350	98,050	-20.15	5,181	-20,044	-10,435	.77	.61	
Construct.	864,823	899,264	3.98	36,323	-102,309	100,406	7.04	1.32	
Manufact.	3,071,029	3,074,774	.12	128,983	-294,819	169,520	24.08	.97	
Transpor.	736,439	778,887	5.76	30,930	-56,485	67,973	6.10	1.02	
Wholesale	747,175	692,275	-7.34	31,381	-13,374	-72,850	5.42	.78	
Retail	2,507,221	2,768,145	10.41	105,303	68,196	87,502	21.68	1.05	
FIRE	800,805	878,416	9.69	33,634	25,626	18,338	6.58	.93	
Services	2,698,420	3,238,106	19.99	113,342	352,440	73,672	25.36	.97	
Unclass.	102,705	270,812	163.00	5,069	49,093	114,702	2.12	1.86	



## APPENDIX F-1 (Continued)

TOTAL NUMBER OF BUSINESS ESTABLISHMENTS AND PAYROLL DATA\*  
 BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
 SOUTH ATLANTIC REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE		% CHANGE	PAYROLL OF BUS. ESTAB.		TOTAL CHANGE		% CHANGE
	1981	1984	1984	1981		1981	1984	1984	1981	
Total	783,834	911,233	127,399	159,377,371	16.25	207,121,809	47,744,438	29.95		
Agriculture	7,846	10,627	2,781	603,786	35.44	833,328	229,542	38.02		
Mining	2,933	3,055	122	2,594,444	4.16	2,597,306	2,862	.11		
Construct.	70,905	85,100	14,195	12,924,954	20.12	15,661,253	2,736,299	21.17		
Manufact.	113,031	48,756	-64,275	48,276,889	-56.86	58,563,247	10,286,358	21.31		
Transpor.	25,029	29,489	4,460	4,855,032	17.81	18,552,979	3,697,947	24.9		
Wholesale	57,230	65,756	8,526	12,675,696	14.95	16,586,201	3,910,505	30.85		
Retail	203,744	238,741	34,997	21,530,185	17.18	27,930,844	6,400,659	29.73		
FIRE	68,058	80,708	12,650	11,646,454	18.59	16,051,596	4,405,142	37.82		
Services	299,144	275,821	23,323	33,135,195	-7.79	48,149,849	15,014,654	4.53		
Unclass.	37,847	73,150	35,303	34,263,940	93.27	32,068,734	-2,195,206	-6.41		

\* All data from County Business Patterns.

## APPENDIX F-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN THE SOUTH ATLANTIC REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	11,460,523	15,811,450	3,156,661	456,337	1,650,603
Agri. & Forest	435,655	441,430	119,308	132,308	18,087
Mining	91,421	129,922	25,181	32,413	-19,093
Construction	828,808	1,118,291	228,285	-16,677	77,875
Manufacturing	2,756,988	3,278,350	759,379	-470,640	232,6203
Total Durables	1,102,474	1,474,724	306,417	-141,722	197,554
Furniture/ Lumber	233,149	290,953	64,218	-4,405	-2,009
Primary Metals	85,361	112,872	23,512	-16,755	20,755
Fab. Metals	116,086	123,127	31,974	-35,077	10,144
Machinery excep Electrical	113,978	219,363	31,394	13,004	60,987
Electrical	168,278	258,341	46,350	-20,387	64,100
Motor Vehicles	188,525	213,821	51,927	-26,403	-227
Other Durables	207,097	256,247	57,042	-49,844	41,952
Total Non-Durables	1,654,514	1,803,626	455,716	386,367	79,763
Food & Kindred	184,684	211,402	50,869	-31,846	7,695
Textile Mills	833,367	909,922	229,541	205,641	52,655
Print/Publish	134,551	197,998	37,060	1,263	25,123
Chemicals	179,436	218,218	49,423	2,307	-12,948
Other Non- Durables	322,476	226,086	88,822	-156,372	11,160
Transportation	763,100	1,138,116	210,187	69,585	95,245
Railroads	85,641	79,089	23,539	-31,467	1,556
Truck Service	150,661	239,648	41,498	23,073	24,416
Other transport	172,153	344,149	47,417	114,087	10,492
Communication	164,637	246,057	45,347	10,960	25,112
Utilities	190,008	229,173	52,335	-39,228	26,058

APPENDIX F-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	434,758	631,538	119,749	30,636	46,395
Retail Trade	1,779,817	2,524,162	490,229	15,411	238,706
Food & Bakery	278,339	421,931	76,665	9,349	57,578
Eating/Drinking	290,770	633,093	57,779	113,904	251,640
General Merchan.	308,245	331,197	84,902	-84,170	22,219
Motor Vehicles	275,105	326,539	75,774	-1,957	17,617
Other Retail	627,358	811,402	172,798	-55,896	67,141
FIRE	520,759	904,511	143,437	136,002	104,314
Banking & CU	177,003	343,142	48,753	78,242	39,144
Insurance/Real Estate	343,756	561,369	94,683	58,175	64,755
Services	3,849,217	5,645,130	1,060,074	-120,480	856,451
Business Serv.	166,504	431,035	45,861	138,057	80,613
Repair Service	163,092	209,187	44,922	-6,803	7,977
Priv. Household	271,000	159,976	74,644	-176,822	8,845
Other Personal Services	414,225	431,124	114,093	120,323	23,129
Entertainment	90,448	169,980	24,913	28,949	25,670
Hospitals	355,870	685,404	98,020	131,510	100,004
Health Services	206,419	395,241	56,86	111,500	20,467
Elem. & Second.	817,465	1,262,249	225,161	83,950	135,674
Other Education	48,647	55,977	13,399	-8,910	2,841
Welfare/Relig.	168,339	325,637	46,367	91,449	19,482
Legal	277,621	351,376	76,467	-60,203	57,491
Public Adminis- tration	869,587	1,167,944	239,517	43,769	102,608

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX F-3 and 4

OCCUPATION OF EMPLOYED PERSONS\* AND  
COMPONENTS OF CHANGE FOR S/S  
SOUTH ATLANTIC REGION  
1970-1980

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
Region Total	11,460,523	15,811,450	3,156,661	-44,917	1,239,182	4,350,927	37.96
Manage/Prof.	2,566,083	4,052,250	706,796	366,795	412,575	1,486,167	57.92
Mgrs & Adminis.	956,583	1,672,359	263,479	301,419	150,878	715,776	74.83
Prof. Special	1,609,500	2,379,891	443,317	74,504	252,569	770,391	47.87
Engineers	154,723	316,826	42,617	78,239	41,247	162,103	104.77
Physicians	69,363	97,263	19,105	-5,590	14,385	27,900	40.22
Health Workers	164,924	258,469	45,426	21,732	26,387	93,545	56.72
Teachers	360,517	754,888	99,300	203,713	91,358	394,371	109.39
Other Tech.	859,973	952,445	236,869	-240,211	95,814	92,472	10.75
Sales Occupa.	786,939	1,572,432	216,753	407,331	161,409	785,493	99.82
Clerical	1,962,934	2,646,683	540,666	-97,064	240,147	683,749	34.83
Craftsmen	1,632,009	2,072,436	449,517	-143,952	134,862	440,427	26.99
Operators	1,664,601	1,542,073	458,494	-682,279	101,257	-122,528	-7.36
Transportation	451,641	536,400	124,399	-73,817	34,177	84,759	18.77
Laborers	573,491	952,056	157,961	186,580	34,024	378,565	66.01
EM Mgr & Lab	346,497	418,361	95,438	-32,575	9,000	71,864	20.74
Farm Manager	155,477	146,902	42,824	-56,711	5,312	-8,575	-5.52
Farm Laborer	191,020	271,459	52,614	59,391	-31,566	80,439	42.11
Serv. Occupa.	1,476,328	2,018,759	406,637	24,063	111,732	542,431	36.74
Cleaning Occ.	266,396	454,986	73,376	53,118	62,097	188,590	70.79
Food	360,418	641,345	99,273	110,119	71,535	280,927	77.79
Protective	138,159	253,205	38,054	37,839	39,153	115,046	83.27
Other	428,417	532,240	118,002	-62,049	47,869	103,823	24.23
Private Hse	282,938	136,983	77,932	-216,133	-7,753	-145,955	-51.59

\*Component calculated by formula in Appendix B.

## APPENDIX G

INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
THE EAST SOUTH CENTRAL REGION

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	4,459,452	5,752,100	1,292,648	28.99
Agri. & Forest	235,734	192,074	43,660	18.52
Mining	51,001	101,167	50,166	98.36
Construction	313,396	374,815	61,419	19.60
Manufacturing	1,253,188	1,448,172	194,984	15.56
Total Durables	609,527	745,134	135,607	22.25
Furniture/ Lumber	122,041	139,999	17,958	14.71
Primary Metals	73,266	87,376	14,110	19.26
Fab. Metals	87,899	82,071	-5,828	-6.63
Machinery excep Electrical	68,416	118,899	50,483	73.79
Electrical	89,784	117,238	27,454	30.58
Motor Vehicles	69,595	98,367	28,772	41.34
Other Durables	98,526	101,184	2,658	2.70
Total Non- Durables	643,661	703,038	59,377	9.22
Food & Kindred	88,271	99,015	10,744	12.17
Textile Mills	261,738	294,684	32,946	12.59
Print/Publish	49,328	67,344	18,016	36.52
Chemicals	84,711	93,834	9,123	10.77
Other Non- Durables	159,613	148,161	-11,452	-7.17
Transportation	292,601	427,235	134,634	46.01
Railroads	40,890	41,251	361	0.88
Truck Service	63,314	101,802	38,488	60.79
Other transport.	47,393	86,323	38,930	82.14
Communication	50,945	78,873	27,928	54.82
Utilities	90,059	118,986	28,927	32.12

APPENDIX G -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	169,968	242,327	72,359	42.57
Retail Trade	661,458	883,433	221,975	33.56
Food & Bakery	110,957	159,064	48,107	43.36
Eating/Drinking	100,676	198,258	97,582	96.93
General Merchan.	103,457	117,797	14,340	13.86
Motor Vehicles	115,184	129,533	14,349	12.46
Other Retail	231,184	278,781	47,597	20.59
FIRE	165,297	269,963	104,666	63.32
Banking & CU	62,913	112,364	49,451	78.60
Insurance/Real Estate	102,384	157,599	55,215	53.93
Services	1,313,809	1,812,914	496,105	37.67
Business Serv.	45,220	107,797	65,577	155.32
Repair Service	60,301	76,693	16,392	27.18
Priv. Household	120,724	58,675	-62,049	-51.40
Other Personal Services	148,223	134,262	-13,961	-9.42
Entertainment	24,626	38,995	14,369	58.35
Hospitals	147,061	260,884	113,823	77.40
Health Services	73,496	145,205	71,709	97.57
Elem. & Second.	330,154	471,823	141,669	42.91
Other Education	16,336	18,637	2,301	14.09
Welfare/Religious	63,194	111,646	48,452	76.67
Legal	80,578	85,434	4,856	6.03
Public Adminis- tration	206,896	302,863	95,967	46.38

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX G-1

EMPLOYMENT AND COMPONENTS OF CHANGE  
FOR S/S -- 1981-1984  
IN EAST SOUTH CENTRAL REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF. SPEC.
	1981	1984						
Total	4,032,918	4,157,115	3.08	169,383	-76,080	30,972	100.00	1.00
Agriculture	16,638	17,940	10.12	684	2,232	-1,268	.43	.95
Mining	88,638	72,916	-17.73	3,723	-14,404	-5,035	1.75	1.40
Construct.	237,493	222,435	-6.34	9,975	28,095	3,064	5.35	1.10
Manufact.	1,332,295	1,287,342	-3.37	55,956	-127,900	-100,854	30.97	1.25
Transpor.	227,062	232,444	2.37	9,537	-17,416	13,260	5.39	.15
Wholesale	506,702	280,736	-44.60	21,281	-9,070	-238,201	6.75	.97
Retail	781,363	847,397	8.45	32,817	21,253	11,955	20.39	.98
FIRE	228,111	238,152	4.40	9,581	7,300	-6,843	5.72	.77
Services	1,587,114	906,718	54.44	24,659	76,677	218,289	21.81	.83
Unclass.	27,848	51,035	83.26	1,170	13,311	8,705	1.22	1.07

## APPENDIX G-1 (Continued)

TOTAL NUMBER OF BUSINESS ESTABLISHMENTS AND PAYROLL DATA\*  
 BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
 EAST SOUTH CENTRAL REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE	% CHANGE	PAYROLL OF 1981	BUS. ESTAB. 1984	TOTAL CHANGE	% CHANGE
	1981	1984						
Total	252,546	300,649	48,103	19.04	53,599,094	65,018,436	11,419,342	21.31
Agriculture	2,267	2,844	577	25.45	165,556	198,446	32,890	19.87
Mining	2,701	2,852	151	5.59	2,022,227	2,059,111	36,884	1.82
Construct.	20,719	22,430	1,711	8.26	3,517,486	3,850,401	332,915	9.46
Manufact.	16,741	18,479	1,738	8.38	20,513,959	23,721,877	3,207,918	15.63
Transpor.	10,410	11,741	1,331	12.78	4,349,444	5,083,647	734,203	16.78
Wholesale	21,605	23,252	1,647	7.63	4,424,584	5,270,177	845,593	19.11
Retail	75,796	85,386	9,590	12.65	6,399,345	7,990,043	1,590,698	24.86
FIRE	20,913	23,155	2,242	10.72	3,153,644	4,108,803	955,159	30.29
Services	68,213	85,209	16,996	24.92	8,695,306	12,114,521	3,419,215	39.32
Unclass.	13,181	25,301	12,120	91.95	357,543	621,411	263,868	73.80

\* All data from County Business Patterns.



## APPENDIX G-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN EAST SOUTH CENTRAL REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	4,459,452	5,752,100	1,228,302	-64,970	129,316
Agri. & Forest	235,734	192,074	64,930	-71,592	-36,998
Mining	51,001	101,167	14,048	18,083	18,036
Construction	313,396	374,815	86,321	-6,306	-18,596
Manufacturing	1,253,188	1,448,172	345,175	-213,929	63,738
Total Durables	609,527	745,134	167,887	-77,650	45,370
Furniture/ Lumber	122,041	139,999	33,615	2,306	-13,351
Primary Metals	73,266	87,376	20,180	-14,381	8,311
Fab. Metals	87,899	82,071	24,211	-26,560	-3,479
Machinery excep Electrical	68,416	118,899	18,844	7,806	23,833
Electrical	89,784	117,238	24,730	-10,877	13,601
Motor Vehicles	69,595	98,367	19,169	9,747	19,350
Other Durables	98,526	101,184	27,138	-23,713	-767
Total Non-Durables	643,661	703,038	177,289	-150,310	32,398
Food & Kindred	88,271	99,015	24,313	-15,221	1,652
Textile Mills	261,738	294,684	72,093	-64,586	25,440
Print/Publish	49,328	67,344	13,587	463	3,966
Chemicals	84,711	93,834	23,333	1,089	-15,299
Other Non- Durables	159,613	148,161	43,963	77,398	21,982
Transportation	292,601	427,235	80,593	30,574	23,466
Railroads	40,890	41,251	11,263	-15,056	4,154
Truck Service	63,314	101,802	17,439	9,696	11,353
Other transport	47,393	86,323	13,054	31,408	-5,531
Communication	50,945	78,873	14,032	3,392	10,504
Utilities	90,059	118,986	24,806	18,593	22,714

APPENDIX G-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	169,968	242,327	46,816	11,977	13,566
Retail Trade	661,458	883,433	182,191	5,727	34,057
Food & Bakery	110,957	159,064	30,562	3,727	13,818
Eating/Drinking	100,676	198,258	27,730	54,667	15,185
General Merchan.	103,457	117,797	28,496	-28,250	14,094
Motor Vehicles	115,184	129,533	31,726	-17,567	190
Other Retail	231,184	278,781	63,677	-20,598	4,518
FIRE	165,297	269,963	45,529	43,169	15,968
Banking & CU	62,913	112,364	17,329	27,810	4,313
Insurance/Real Estate	102,384	157,599	28,200	17,327	9,688
Services	1,313,809	1,812,914	362,649	117,327	16,065
Business Serv.	45,220	107,797	11,629	35,327	18,941
Repair Service	60,301	76,693	16,609	-2,515	2,298
Priv. Household	120,724	58,675	33,252	-78,770	-16,531
Other Personal Services	148,223	134,262	40,826	-43,056	-11,732
Entertainment	24,626	38,995	6,783	7,882	-296
Hospitals	147,061	260,884	40,506	54,346	18,971
Health Services	73,496	145,205	20,244	39,700	11,766
Elem. & Second.	330,154	471,823	90,937	33,905	16,827
Other Education	16,336	18,637	4,500	-2,992	794
Welfare/Relig.	63,194	111,646	17,406	34,330	-3,284
Legal	80,578	85,434	22,194	-17,474	135
Public Adminis- tration	206,896	302,863	56,987	-10,414	49,394

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX G-3 and 4

OCCUPATION OF EMPLOYED PERSONS\* AND  
COMPONENTS OF CHANGE FOR S/S  
EAST SOUTH CENTRAL REGION  
1970-1980

	1970		1980		NET SHARE EST. 1970		IND. MIX EST. 1970		LOCAL SHARE 1970		TOTAL CHANGE REGION		% CHANGE	
Region Total	4,459,452		5,752,100		1,228,302		-95,981		160,327		1,292,648		28.99	
Manage/Prof.	882,187		1,273,428		242,988		126,100		22,154		391,241		44.35	
Mrgs & Adminis.	339,619		496,870		93,544		107,014		-43,307		157,251		46.30	
Prof. Special	542,568		776,558		149,444		25,116		59,431		233,990		43.13	
Engineers	48,699		91,535		13,414		24,626		4,797		42,836		87.96	
Physicians	25,138		30,068		6,924		-2,026		32		4,930		19.61	
Health Workers	60,013		85,826		16,530		7,908		1,375		25,813		43.01	
Teachers	148,318		281,914		40,852		83,808		8,935		133,596		90.07	
Other Tech.	260,400		287,215		71,724		-72,736		27,827		26,815		10.30	
Sales Occupa.	286,085		547,197		78,799		148,082		34,231		261,112		91.27	
Clerical	636,874		858,173		175,419		-31,493		77,372		221,299		34.75	
Craftsmen	645,451		796,259		77,782		-56,932		29,959		150,808		23.36	
Operators	774,424		735,648		213,306		-317,417		65,336		-38,776		-5.01	
Transportation	205,863		234,055		56,702		-33,647		5,136		28,192		13.69	
Laborers	244,491		413,129		67,342		79,543		21,753		168,638		68.98	
EM Mgr & Lab	208,476		192,973		57,422		-19,599		-53,326		-15,503		-7.44	
Farm Manager	124,432		98,387		34,273		-45,388		-14,931		-26,045		-20.93	
Farm Laborer	84,044		94,586		23,149		26,130		-38,737		10,542		12.54	
Serv. Occupa.	575,601		701,238		158,542		9,382		-42,288		125,637		21.83	
Cleaning Occ.	106,078		163,051		29,218		21,151		6,604		56,973		53.71	
Food	131,198		214,309		36,137		40,085		6,889		83,111		63.35	
Protective	47,807		77,950		13,168		13,093		3,882		30,143		63.05	
Other	166,630		195,715		45,896		-24,133		7,322		29,085		17.45	
Private Hse	123,888		50,213		34,123		-94,637		-13,162		-73,675		-59.47	

\*Component calculated by formula in Appendix B.

## APPENDIX H

 INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
 THE MIDDLE ATLANTIC REGION  
 1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	1,451,871	15,690,571	1,170,700	8.06
Agri. & Forest	196,352	193,031	-3,321	-1.72
Mining	57,670	67,632	9,962	14.73
Construction	740,222	669,127	-71,095	-10.63
Manufacturing	4,185,234	3,798,131	-387,103	-10.19
Total Durables	2,309,319	2,166,029	-143,290	-6.62
Furniture/ Lumber	93,767	103,275	9,508	9.21
Primary Metals	330,869	300,696	-30,173	-10.03
Fab. Metals	258,355	223,004	-35,351	-15.85
Machinery excep Electrical	383,216	450,543	67,327	14.94
Electrical	466,612	389,616	-76,996	-19.76
Motor Vehicles	233,789	218,298	-15,491	-7.10
Other Durables	542,711	480,597	-62,114	-12.92
Total Non- Durables	1,875,915	1,632,102	-243,813	-14.94
Food & Kindred	234,612	219,424	-15,188	-6.92
Textile Mills	574,504	468,113	-106,391	-18.52
Print/Publish	302,142	340,809	38,667	11.35
Chemicals	256,576	301,971	45,395	15.03
Other Non- Durables	508,081	301,785	-206,296	-68.36
Transportation	1,080,837	1,236,851	156,014	12.61
Railroads	106,828	83,367	-23,461	-28.14
Truck Service	202,013	228,667	26,654	11.66
Other transport.	293,630	469,018	175,388	37.39
Communication	228,382	248,607	20,225	8.14
Utilities	249,984	207,192	-42,792	-20.65

APPENDIX H -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	595,599	696,823	101,224	14.53
Retail Trade	2,202,364	2,377,590	170,226	7.17
Food & Bakery	379,567	412,565	32,998	8.00
Eating/Drinking	405,763	607,991	202,228	33.26
General Merchan.	395,067	341,807	-53,260	-15.58
Motor Vehicles	226,648	235,438	8,790	3.73
Other Retail	795,319	774,789	-20,530	-2.65
FIRE	895,688	1,102,954	207,266	18.79
Banking & CU	289,779	420,829	131,050	31.14
Insurance/Real Estate	605,909	682,125	76,216	11.17
Services	4,565,905	5,553,432	987,527	21.63
Business Serv.	321,842	546,509	224,667	41.11
Repair Service	206,929	197,90	-9,339	-4.73
Priv. Household	145,594	101,080	-44,514	-44.04
Other Personal Services	402,144	324,105	-78,039	-24.08
Entertainment	121,812	169,331	47,519	28.06
Hospitals	536,625	806,981	270,356	33.50
Health Services	284,578	483,277	198,699	41.11
Elem. & Second.	1,042,927	1,296,926	253,999	19.58
Other Education	64,428	68,490	4,062	5.93
Welfare/Religious	236,343	377,676	141,333	37.42
Legal	450,576	384,233	-66,343	-17.27
Public Adminis- tration	752,107	797,234	45,127	5.66

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX H-1

EMPLOYMENT AND COMPONENTS OF CHANGE  
FOR S/S -- 1981-1984  
IN THE MIDDLE ATLANTIC REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF. SPEC.
	1981	1984						
Total	12,583,068	13,001,308	3.32	528,488	76,903	100.00	1.00	
Agriculture	24,481	37,017	51.21	1,028	3,354	8,155	.28	.62
Mining	63,217	53,556	-15.28	2,655	-10,272	2,042	.41	.33
Construct.	500,204	506,060	1.17	21,009	-59,174	44,008	3.89	.73
Manufact.	3,588,661	3,237,937	-9.77	150,724	344,511	-156,824	24.90	1.00
Transpor.	821,535	836,999	1.88	34,504	-63,012	43,952	6.43	1.07
Wholesale	919,287	945,509	2.85	38,610	-16,455	4,045	7.27	1.05
Retail	2,185,410	2,350,558	7.56	91,787	59,443	13,987	18.08	.87
FIRE	1,094,119	1,179,519	7.80	45,953	35,012	4,376	9.07	1.22
Services	3,297,598	3,742,261	13.48	138,499	430,666	-124,687	28.78	1.10
Unclass.	87,556	111,892	27.79	24,336	3,677	41,852	.86	.49

## APPENDIX H-1 (Continued)

TOTAL NUMBER OF BUSINESS ESTABLISHMENTS AND PAYROLL DATA\*  
BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
MIDDLE ATLANTIC REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE	% CHANGE	PAYROLL OF BUS. ESTAB. 1981	BUS. ESTAB. 1984	TOTAL CHANGE	% CHANGE
	1981	1984						
Total	739,624	860,566	120,942	16.35	204,093,854	251,714,964	47,621,110	23.33
Agriculture	6,644	8,534	1,890	28.47	376,523	558,731	182,208	48.39
Mining	1,996	2,132	136	6.81	1,531,733	1,629,447	97,714	6.38
Construct.	55,699	63,469	7,770	13.95	10,220,108	12,535,264	2,315,156	22.65
Manufact.	60,314	62,395	2,081	3.45	69,863,761	75,046,538	5,182,777	7.42
Transport.	28,520	31,663	3,143	11.02	18,288,309	21,707,797	3,419,488	18.70
Wholesale	67,283	73,264	5,981	8.89	18,556,464	23,128,868	4,572,404	24.64
Retail	192,148	215,667	23,519	12.24	19,921,243	24,878,320	4,957,077	24.88
FIRE	71,364	79,592	8,228	11.53	19,986,535	28,911,218	8,924,683	44.65
Services	219,308	265,322	46,014	20.98	44,552,477	60,900,602	16,348,125	36.69
Unclass.	36,348	58,528	22,180	61.02	1,397,301	2,418,178	1,020,877	73.06

\* All data from County Business Patterns.

## APPENDIX H-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN THE MIDDLE ATLANTIC REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	14,519,871	15,690,571	3,999,322	45,985	-2,874,607
Agri. & Forest	196,352	193,031	54,083	-59,632	2,171
Mining	57,670	67,632	15,884	20,447	-27,837
Construction	740,222	669,127	203,885	-14,895	-267,639
Manufacturing	4,185,234	3,798,131	1,152,772	-714,453	-864,875
Total Durables	2,309,319	2,166,029	636,074	-294,192	-494,651
Furniture/ Lumber	93,767	103,275	25,827	-1,772	-15,423
Primary Metals	330,869	300,696	91,134	-64,946	-59,389
Fab. Metals	258,355	223,004	71,161	-78,066	-34,049
Machinery excep Electrical	383,216	450,543	105,552	43,722	-92,009
Electrical	466,612	389,616	128,523	-56,530	-164,205
Motor Vehicles	233,789	218,298	64,394	-32,743	-48,242
Other Durables	542,711	480,597	149,483	-130,619	-89,006
Total Non-Durables	1,875,915	1,632,102	516,598	-438,069	-358,864
Food & Kindred	234,612	219,424	64,621	-40,455	-40,405
Textile Mills	574,504	468,113	158,240	-141,764	-3,096,741
Print/Publish	302,142	340,809	83,221	2,836	-51,778
Chemicals	256,576	301,971	70,671	3,299	-35,398
Other Non- Durables	508,081	301,785	139,945	-246,373	-240,888
Transportation	1,080,837	1,236,851	297,703	112,938	-274,307
Railroads	106,828	83,367	29,424	-39,335	-20,153
Truck Service	202,013	228,667	55,642	30,938	-63,033
Other transport	293,630	469,018	80,877	194,590	-165,665
Communication	228,382	248,607	62,905	15,204	-59,530
Utilities	249,984	207,192	68,855	-51,611	-68,875



APPENDIX H-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	595,599	696,823	164,050	41,970	-119,501
Retail Trade	2,202,364	2,372,590	606,614	19,069	-467,671
Food & Bakery	379,567	412,565	104,547	12,749	-86,938
Eating/Drinking	405,763	607,991	111,762	220,328	-197,127
General Merchan.	395,067	341,807	108,816	-107,877	-62,498
Motor Vehicles	226,648	235,438	62,427	-34,567	-19,399
Other Retail	795,319	774,789	219,061	-70,860	-169,275
FIRE	895,688	1,102,954	246,706	233,918	-312,308
Banking & CU	289,779	420,829	79,816	128,093	117,669
Insurance/Real Estate	605,909	682,125	166,890	102,540	201,730
Services	4,565,905	5,553,432	1,257,623	406,623	-676,719
Business Serv.	321,842	546,509	88,647	266,855	-223,195
Repair Service	206,929	197,590	56,996	-8,632	-58,145
Priv. Household	145,594	101,080	40,102	-94,997	-9,222
Other Personal Services	402,144	324,105	110,766	-116,814	-90,781
Entertainment	121,812	169,331	33,552	-38,988	-38,356
Hospitals	536,625	806,981	147,807	198,307	-166,333
Health Services	284,578	483,277	78,384	153,718	115,098
Elem. & Second.	1,042,927	1,296,926	287,262	107,104	-190,111
Other Education	64,428	68,490	17,746	-11,801	-2,124
Welfare	236,343	377,676	65,098	128,391	-105,045
Legal	450,576	384,233	124,106	-97,709	-104,194
Public Adminis- tration	752,107	797,234	207,159	-37,855	-126,731

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

APPENDIX H-3 and 4

OCCUPATION OF EMPLOYED PERSONS\* AND  
COMPONENTS OF CHANGE FOR S/S  
MIDDLE ATLANTIC REGION  
1970-1980

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
Region Total	14,519,871	15,690,571	3,999,323	7,319	-2,835,942	1,170,700	8.06
Manage/Prof.	3,451,258	4,260,514	950,607	493,322	-634,673	809,256	23.45
Mrgs & Adminis.	1,174,209	1,669,357	323,422	369,993	-198,266	495,148	13.79
Prof. Special	2,277,049	2,591,157	627,186	105,405	-418,483	314,108	50.37
Engineers	231,154	347,577	63,669	116,888	-64,134	116,423	4.91
Physicians	119,928	125,815	33,033	-9,666	-17,480	5,887	4.91
Health Workers	240,735	319,981	66,308	31,722	-18,783	79,246	32.92
Teachers	478,143	771,366	131,699	270,178	-108,654	293,223	61.33
Other Tech.	1,207,089	1,026,418	332,478	-337,169	-175,981	-180,671	-14.97
Sales Occupa.	1,069,531	1,502,525	294,589	553,605	-415,201	432,994	40.48
Clerical	2,963,010	3,061,655	816,125	-146,517	570,963	98,645	3.33
Craftsmen	1,932,993	1,822,480	532,420	-170,500	-472,432	-110,513	-5.72
Operators	2,038,588	1,482,814	561,504	-835,567	-281,711	-555,774	-27.26
Transportation	559,102	511,649	153,998	-91,381	-110,070	-47,453	-8.49
Laborers	582,409	812,912	160,418	189,481	-119,396	230,503	39.58
EM Mgr & Lab	149,296	199,944	41,122	-14,036	23,562	50,648	33.92
Farm Manager	84,574	75,993	23,295	-30,849	-1,027	-8,581	-10.15
Farm Laborer	64,722	123,951	17,827	20,123	21,279	59,229	91.51
Serv. Occupa.	1,773,684	2,036,078	488,540	28,911	-255,057	262,394	14.79
Cleaning Occ.	346,147	437,259	95,342	69,020	-73,250	91,112	26.32
Food	478,064	657,932	131,677	146,064	-97,873	179,868	37.62
Protective	235,060	300,846	64,744	64,378	-63,336	65,786	27.99
Other	558,183	554,639	153,745	-80,843	-76,446	-3,544	-0.63
Private Hse	156,230	85,402	43,032	-119,343	5,483	-70,828	-45.34

\*Component calculated by formula in Appendix B.

## APPENDIX I

 INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
 THE NEW ENGLAND REGION  
 1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	4,750,972	5,702,735	951,763	20.03
Agri. & Forest	70,390	72,501	2,111	3.00
Mining	5,905	5,384	-521	-8.82
Construction	271,788	259,392	-12,396	-4.56
Manufacturing	1,497,267	1,609,105	111,838	7.47
Total Durables	915,980	1,076,331	160,351	17.51
Furniture/ Lumber	47,413	55,677	8,264	17.43
Primary Metals	54,846	55,475	629	1.15
Fab. Metals	111,875	123,544	11,669	10.43
Machinery excep Electrical	175,491	253,556	78,065	44.48
Electrical	187,707	202,313	14,606	7.78
Motor Vehicles	140,764	159,302	18,538	13.17
Other Durables	197,884	226,462	28,578	14.44
Total Non- Durables	581,287	532,774	-48,513	-8.35
Food & Kindred	54,093	53,714	-379	-0.70
Textile Mills	148,935	129,310	-19,625	-13.18
Print/Publish	83,820	106,844	23,024	27.47
Chemicals	43,598	61,712	18,114	41.55
Other Non- Durables	250,841	181,194	-69,647	-27.76
Transportation	252,755	331,444	78,689	31.13
Railroads	16,274	13,272	-3,002	-18.45
Truck Service	53,598	61,996	8,398	15.67
Other transport.	49,683	118,802	69,119	139.12
Communication	67,234	76,226	8,992	13.37
Utilities	65,606	61,148	-4,458	-6.80

APPENDIX I -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	186,545	207,371	20,826	11.16
Retail Trade	735,252	868,416	133,164	18.11
Food & Bakery	126,760	153,010	26,250	20.17
Eating/Drinking	131,653	226,907	95,254	72.35
General Merchan.	124,621	105,823	-18,798	-15.08
Motor Vehicles	83,751	92,368	8,617	10.29
Other Retail	268,467	290,308	21,841	8.14
FIRE	257,660	365,847	108,187	41.99
Banking & CU	76,907	123,360	46,453	60.40
Insurance/Real Estate	180,753	242,487	61,734	34.15
Services	1,473,410	1,983,275	509,865	34.60
Business Serv.	74,527	152,978	78,451	105.27
Repair Service	59,158	68,373	9,215	15.58
Priv. Household	43,171	29,931	-13,240	-30.67
Other Personal Services	120,317	113,475	-6,842	-5.69
Entertainment	29,609	47,680	18,071	61.03
Hospitals	194,616	293,383	98,767	50.75
Health Services	110,552	201,005	90,453	81.82
Elem. & Second.	383,856	524,741	140,885	36.70
Other Education	25,647	27,706	2,059	8.03
Welfare/Religious	65,466	120,710	55,244	84.39
Legal	139,045	129,714	-9,331	-6.71
Public Adminis- tration	227,446	273,579	46,133	20.28

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX I-1

EMPLOYMENT AND COMPONENTS OF CHANGE  
FOR S/S -- 1981-1984  
IN THE NEW ENGLAND REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF. SPEC.
	1981	1984						
Total	4,742,599	5,084,256	7.20	199,189	16,818	125,650	100.00	1.00
Agriculture	15,106	17,846	18.13	634	2,070	35	.35	.80
Mining	4,500	4,435	-1.44	189	-731	477	.08	.69
Construct.	197,515	210,778	6.71	8,295	-23,366	28,324	4.15	.77
Manufact.	1,536,509	1,478,399	-3.78	-58,110	64,533	-147,505	29.08	1.17
Transpor.	220,244	233,098	5.83	9,250	-16,893	20,483	4.58	.76
Wholesale	276,473	293,381	6.11	11,612	4,949	10,230	5.77	.84
Retail	889,935	979,911	10.11	37,377	24,206	28,388	19.27	.93
FIRE	349,399	382,790	9.56	14,675	11,181	7,547	7.53	1.02
Services	1,226,507	1,432,320	16.78	51,513	160,181	-5,887	28.17	1.07
Unclass.	26,411	51,343	94.40	1,109	12,624	11,198	1.01	.88

## APPENDIX I-1 (Continued)

TOTAL NUMBER OF BUSINESS ESTABLISHMENTS AND PAYROLL DATA\*  
 BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
 NEW ENGLAND REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE	% CHANGE	PAYROLL OF BUS. ESTAB.		TOTAL CHANGE	% CHANGE
	1981	1984			1981	1984		
Total	265,505	322,009	56,504	21.28	69,494,385	91,623,661	22,129,276	31.84
Agriculture	3,246	4,127	881	27.14	202,080	257,858	55,778	27.60
Mining	311	316	5	1.61	110,194	143,003	32,809	29.77
Construct.	25,150	29,403	4,253	16.91	3,979,126	4,816,682	837,556	21.05
Manufact.	23,262	25,114	1,852	7.96	27,393,433	32,989,704	5,596,271	20.43
Transpor.	9,208	10,313	1,105	12.00	4,332,845	5,452,849	1,120,004	25.85
Wholesale	19,225	21,216	1,991	10.36	5,157,137	6,652,910	1,495,773	29.00
Retail	72,489	82,722	10,233	14.12	7,465,403	10,034,713	2,569,310	34.41
FIRE	20,602	23,380	2,778	13.48	5,670,541	8,108,531	2,437,990	43.00
Services	80,342	98,625	18,283	22.76	14,697,619	21,902,076	7,204,457	49.01
Unclass.	11,570	26,793	15,223	132.00	414,010	1,265,335	851,325	205.62

\* All data from County Business Patterns.

## APPENDIX I-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN THE NEW ENGLAND REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	4,750,972	5,702,735	1,308,597	-35,918	-320,915
Agri. & Forest	70,390	72,501	19,388	-21,377	4,100
Mining	5,905	5,384	1,626	2,094	4,241
Construction	271,788	259,392	74,861	-5,469	-81,788
Manufacturing	1,497,267	1,609,105	412,404	-255,596	-44,970
Total Durables	915,980	1,076,331	252,296	-116,690	24,745
Furniture/ Lumber	47,413	55,677	13,059	-896	-3,900
Primary Metals	54,846	55,475	15,107	-10,766	-3,712
Fab. Metals	111,875	123,544	30,815	-33,805	14,659
Machinery excep Electrical	175,491	253,556	48,337	20,022	9,706
Electrical	187,707	202,313	51,702	-22,741	-14,355
Motor Vehicles	140,764	159,302	38,772	-19,714	-519
Other Durables	197,884	226,462	54,505	-47,626	21,700
Total Non-Durables	581,287	532,774	160,108	-135,744	-72,878
Food & Kindred	54,093	53,714	14,899	-9,328	-5,951
Textile Mills	148,935	129,310	41,022	-36,751	-23,896
Print/Publish	83,820	106,844	23,087	787	-850
Chemicals	43,598	61,712	12,009	561	5,545
Other Non- Durables	250,841	181,194	69,091	121,635	526,454
Transportation	252,755	331,444	69,618	26,411	-17,340
Railroads	16,274	13,272	4,482	-5,992	-1,492
Truck Service	53,598	61,996	14,763	8,208	-14,573
Other transport	49,683	118,802	13,685	32,925	22,509
Communication	67,234	76,226	18,519	4,476	-14,003
Utilities	65,606	61,148	18,070	-13,545	-8,984

APPENDIX I-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	186,545	207,371	51,382	13,145	-43,701
Retail Trade	735,252	868,416	202,516	6,366	-75,718
Food & Bakery	126,760	153,010	34,914	4,258	-12,922
Eating/Drinking	131,653	226,907	36,262	71,487	-12,495
General Merchan.	124,621	105,823	34,325	-34,029	-19,094
Motor Vehicles	83,751	92,368	23,068	-12,773	-1,678
Other Retail	268,467	290,308	73,946	23,920	28,185
FIRE	257,660	365,847	70,969	67,291	-30,073
Banking & CU	76,907	123,360	21,183	33,996	-8,726
Insurance/Real Estate	180,753	242,487	49,786	30,589	-18,642
Services	1,473,410	1,983,275	405,833	131,217	-27,184
Business Serv.	74,527	152,978	20,528	61,794	-3,871
Repair Service	59,158	68,373	16,294	-2,468	-4,612
Priv. Household	43,171	29,931	11,891	-28,168	3,037
Other Personal Services	120,317	113,475	33,140	-34,949	-5,032
Entertainment	29,609	47,680	8,155	9,477	439
Hospitals	194,616	293,383	53,605	71,919	-26,757
Health Services	110,552	201,005	30,450	59,716	287
Elem. & Second.	383,856	524,741	105,728	39,420	-4,264
Other Education	25,647	27,706	7,064	-4,698	-308
Welfare/Relig.	65,466	120,710	18,032	35,564	1,648
Legal	139,045	129,714	38,298	-30,152	-17,477
Public Adminis- tration	227,446	273,579	62,647	-11,448	-5,066

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data



## APPENDIX I-3 and 4

 OCCUPATION OF EMPLOYED PERSONS\* AND  
 COMPONENTS OF CHANGE FOR S/S  
 NEW ENGLAND REGION  
 1970-1980

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
	Region Total	4,750,972	5,702,735	1,308,597	-32,732	324,103	951,763
Manage/Prof.	1,101,441	1,622,722	328,168	170,304	-67,141	431,331	36.20
Mgrs & Adminis.	405,060	617,199	111,569	127,634	-27,064	212,139	52.37
Prof. Special	756,381	1,005,573	208,336	35,013	5,843	249,192	32.95
Engineers	96,196	157,214	26,496	48,644	-14,122	61,018	63.43
Physicians	36,724	41,179	10,115	-2,960	-2,700	4,455	12.13
Health Workers	97,553	124,666	26,870	12,855	-12,616	27,108	27.79
Teachers	165,825	311,466	45,674	93,701	6,266	145,641	87.83
Other Tech.	390,083	371,053	107,444	-108,959	-17,514	-19,030	-4.77
Sales Occupa.	321,383	528,148	88,521	166,353	-48,109	206,765	64.34
Clerical	881,826	1,013,340	242,888	-43,605	-67,769	131,514	14.91
Craftsmen	666,735	707,840	183,644	-58,810	-83,730	41,105	6.17
Operators	746,261	634,553	205,548	-305,874	-11,383	-111,708	-14.97
Transportation	149,038	149,665	41,051	-24,359	-16,065	627	0.42
Laborers	178,547	245,043	49,179	58,089	-40,771	66,496	37.24
EM Mgr & Lab	44,112	77,002	12,150	-4,147	24,887	32,890	74.56
Farm Manager	21,720	19,464	5,983	-7,923	-316	-2,256	-10.39
Farm Laborer	22,392	57,538	6,168	6,962	22,066	35,146	156.96
Serv. Occupa.	571,629	724,372	157,448	9,317	-14,022	152,743	26.72
Cleaning Occ.	109,001	142,911	30,023	21,734	-17,847	33,910	31.11
Food	167,660	257,762	46,180	51,226	-7,303	90,102	53.74
Protective	68,261	96,521	18,802	18,695	-9,237	28,260	41.40
Other	185,173	202,608	51,004	-26,819	-6,750	17,435	9.42
Private Hse	41,534	24,570	11,440	-31,727	3,323	16,964	-40.84

\*Component calculated by formula in Appendix B.

## APPENDIX J

 INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
 THE EAST NORTH CENTRAL REGION  
 1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total	15,456,519	17,858,338	2,401,819	15.54
Agri. & Forest	440,184	446,280	6,096	1.38
Mining	66,237	91,550	25,313	38.22
Construction	778,896	809,478	30,582	3.93
Manufacturing	5,207,926	5,151,749	-56,177	-1.08
Total Durables	3,774,056	3,738,048	-36,008	-0.95
Furniture/ Lumber	150,008	178,524	28,516	19.01
Primary Metals	473,084	481,921	8,837	1.87
Fab. Metals	462,345	440,463	-21,882	-4.73
Machinery excep Electrical	779,455	850,509	71,054	9.12
Electrical	529,591	488,324	-41,267	-7.79
Motor Vehicles	857,126	888,427	31,301	3.65
Other Durables	522,447	409,880	-112,567	-21.55
Total Non- Durables	1,433,870	1,413,701	-20,169	-1.41
Food & Kindred	29,579	319,661	22,082	7.42
Textile Mills	107,681	90,308	-17,373	-16.13
Print/Publish	284,583	322,024	37,441	13.16
Chemicals	200,406	254,668	54,262	27.08
Other Non- Durables	543,621	427,040	-116,581	-21.45
Transportation	957,820	1,197,330	239,510	25.01
Railroads	151,606	126,936	24,670	-16.27
Truck Service	238,618	311,363	72,745	30.49
Other transport.	146,111	298,949	152,838	104.60
Communication	188,178	224,293	36,115	19.19
Utilities	233,307	235,789	2,482	1.06

APPENDIX J -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	585,543	732,263	146,720	25.06
Retail Trade	2,446,307	2,907,979	461,672	18.87
Food & Bakery	381,130	431,223	50,093	13.14
Eating/Drinking	489,485	841,788	352,303	71.97
General Merchan.	457,711	407,939	-49,772	-10.87
Motor Vehicles	317,05	338,974	21,939	6.92
Other Retail	800,946	888,055	87,109	10.88
FIRE	673,913	980,322	306,409	45.47
Banking & CU	238,404	380,778	142,374	59.72
Insurance/Real Estate	435,509	599,544	164,035	37.67
Services	4,299,693	5,541,387	1,241,694	28.87
Business Serv.	224,470	426,506	202,036	90.01
Repair Service	188,987	214,101	25,114	13.29
Priv. Household	144,447	87,684	-56,763	-39.30
Other Personal Services	420,702	367,672	-53,030	-12.61
Entertainment	100,082	145,889	45,807	45.77
Hospitals	550,057	838,858	288,801	52.50
Health Services	296,392	543,258	246,866	83.29
Elem. & Second.	1,126,878	1,450,642	323,764	28.73
Other Education	57,261	63,133	5,872	10.25
Welfare/Religious	216,917	376,013	159,096	73.34
Legal	342,670	311,525	-31,145	-9.09
Public Adminis- tration	630,830	716,106	85,276	13.52

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

APPENDIX J-1  
 EMPLOYMENT AND COMPONENTS OF CHANGE  
 FOR S/S -- 1981-1984  
 IN EAST NORTH CENTRAL REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF. SPEC.
	1981	1984						
Total	13,763,029	13,715,027	-.35	577,894	105,923	-519,981	100.00	1.00
Agriculture	35,147	43,275	23.12	1,476	4,859	1,855	.32	.68
Mining	87,671	79,440	9.39	3,682	-14,246	2,332	.58	.50
Construct.	572,082	500,529	-12.51	24,029	-67,677	-27,918	3.65	.68
Manufact.	4,856,701	4,239,250	-12.71	203,981	-466,234	-355,025	30.91	1.25
Transpor.	730,166	715,013	-2.07	30,666	-56,003	10,222	5.21	.87
Wholesale	916,702	921,402	.51	38,501	-16,408	-17,417	6.72	.97
Retail	2,736,996	2,778,258	1.51	114,953	74,446	-148,071	20.26	.98
FIRE	902,680	924,413	2.41	37,913	28,886	-45,044	6.74	.91
Services	2,854,439	3,393,611	18.89	119,886	372,790	46,527	24.74	.95
Unclass.	70,445	119,836	70.11	2,832	33,673	12,758	.87	.76

## APPENDIX J-1 (Continued)

TOTAL NUMBER OF BUSINESS ESTABLISHMENTS AND PAYROLL DATA\*  
BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
EAST NORTH CENTRAL REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE	% CHANGE	PAYROLL OF BUS. ESTAB.		TOTAL CHANGE	% CHANGE
	1981	1984			1981	1984		
Total	765,155	886,751	121,596	15.89	226,793,305	261,937,464	35,144,159	15.50
Agriculture	7,038	8,745	1,707	24.25	475,498	640,585	165,087	34.72
Mining	3,255	3,614	359	11.02	2,135,128	2,437,534	302,406	14.16
Construct.	64,300	67,294	3,005	4.67	12,469,693	12,917,852	448,159	3.59
Manufact.	62,332	66,370	4,038	6.48	100,081,945	110,041,715	9,932,770	9.92
Transport.	26,914	30,283	3,368	12.52	16,089,371	18,234,208	2,153,837	13.38
Wholesale	67,538	70,485	2,947	4.36	18,038,102	20,902,491	2,864,389	15.88
Retail	212,881	233,758	20,877	9.81	23,618,626	27,689,721	4,071,095	17.24
FIRE	68,420	74,800	6,380	9.32	14,116,322	15,915,675	1,799,353	12.75
Services	221,198	267,761	46,563	21.05	38,801,574	51,225,332	12,423,758	32.02
Unclass.	30,580	63,641	33,061	108.11	967,047	1,950,251	983,204	101.67

\* All data from County Business Patterns.

## APPENDIX J-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN EAST NORTH CENTRAL REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	15,456,519	17,858,338	4,257,310	-293,279	-1,562,212
Agri. & Forest	440,184	446,280	121,243	-133,683	18,536
Mining	66,237	91,550	18,244	-23,484	-16,416
Construction	778,896	809,478	214,537	-15,637	-168,602
Manufacturing	5,207,926	5,151,749	1,434,460	888,992	-601,602
Total Durables	3,774,056	3,738,048	1,039,518	-480,789	-594,737
Furniture/ Lumber	150,008	178,524	41,318	-2,834	-9,968
Primary Metals	473,084	481,921	130,305	-92,861	-2,607
Fab. Metals	462,345	440,463	127,347	-139,706	-9,524
Machinery excep Electrical	779,455	850,509	214,691	88,931	-232,568
Electrical	529,591	488,324	145,869	-64,160	-122,977
Motor Vehicles	857,126	888,427	236,085	-120,043	-84,741
Other Durables	522,447	409,880	143,902	-125,742	-130,727
Total Non-Durables	1,433,870	1,413,701	394,942	-334,841	-80,270
Food & Kindred	297,579	39,661	81,965	-51,313	-8,570
Textile Mills	107,681	90,308	29,659	-26,571	-20,461
Print/Publish	284,583	322,024	78,385	-2,672	-43,616
Chemicals	200,406	254,668	55,199	2,576	-3,514
Other Non- Durables	543,621	427,040	149,734	-263,607	-2,708
Transportation	957,820	1,197,330	263,820	100,084	-124,394
Railroads	151,606	126,936	41,758	-55,822	-10,606
Truck Service	238,618	311,363	65,724	36,544	-29,523
Other transport	146,111	298,949	40,244	96,828	15,765
Communication	188,178	224,293	51,831	12,528	-28,244
Utilities	233,307	235,789	64,262	-48,167	-13,612

APPENDIX J-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	585,543	732,263	161,281	41,261	-55,822
Retail Trade	2,446,307	2,907,979	673,805	21,181	-233,315
Food & Bakery	381,130	431,223	104,978	12,802	-67,686
Eating/Drinking	489,485	841,788	134,823	265,789	-48,308
General Merchan.	457,711	407,939	126,071	-124,983	-50,860
Motor Vehicles	317,035	338,974	87,323	-48,352	-17,033
Other Retail	800,946	888,055	220,611	-71,362	-62,140
FIRE	673,913	980,322	185,621	175,999	-55,212
Banking & CU	238,404	380,778	65,665	105,383	-28,675
Insurance/Real Estate	345,509	599,544	119,956	73,703	-29,623
Services	4,299,693	5,541,387	383,103	329,917	326,129
Business Serv.	224,470	426,506	61,828	186,119	-45,911
Repair Service	188,987	214,101	52,054	7,883	-19,057
Priv. Household	144,447	87,684	39,786		
Other Personal Services	420,702	367,672	115,877	-122,205	-46,702
Entertainment	100,082	145,889	27,566	32,033	-13,792
Hospitals	550,057	838,858	151,506	203,271	-65,976
Health Services	296,392	543,258	81,638	160,100	5,129
Elem. & Second.	1,112,878	1,450,642	310,385	115,725	-102,346
Other Education	57,261	63,133	15,772	-10,488	588
Welfare/Relig.	216,917	376,013	59,747	117,838	-18,489
Legal	342,670	311,525	94,384	74,309	51,220
Public Adminis- tration	630,830	716,106	173,754	31,751	56,727

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX J-3 and 4

 OCCUPATION OF EMPLOYED PERSONS\* AND  
 COMPONENTS OF CHANGE FOR S/S  
 EAST NORTH CENTRAL REGION  
 1970-1980

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
Region Total	15,456,519	17,858,338	4,257,310	-251,978	-1,603,513	2,401,819	15.54
Manage/Prof.	3,267,174	4,305,253	899,903	467,009	-328,833	1,038,079	31.77
Mgrs & Adminis.	1,131,387	1,708,368	311,627	356,500	-91,145	576,981	51.00
Prof. Special	2,135,787	2,596,885	588,277	98,866	-226,045	461,098	21.59
Engineers	239,634	366,213	66,004	21,176	-60,602	126,579	52.82
Physicians	100,106	110,883	27,573	-8,068	-8,728	10,777	10.77
Health Workers	227,405	319,190	62,636	29,965	-816	91,785	40.36
Teachers	493,710	825,700	135,986	278,975	-82,971	331,990	67.24
Other Tech.	1,074,932	974,899	296,077	-300,254	-95,856	-100,033	-9.31
Sales Occupa.	1,060,205	1,704,719	292,021	548,778	-196,285	644,514	60.79
Clerical	2,734,983	3,031,313	753,318	-135,241	-321,747	296,330	10.83
Craftsmen	2,276,459	2,291,963	627,023	-200,796	-410,723	15,504	0.68
Operators	2,549,049	2,094,073	702,104	-1,044,792	-112,288	-454,976	-17.85
Transportation	609,306	603,895	167,826	-99,792	-73,651	5,411	-0.89
Laborers	670,268	1,051,576	184,617	28,066	-21,375	381,308	56.89
EM Mgr & Lab	387,327	432,851	106,685	-36,413	-24,747	45,524	11.75
Farm Manager	278,216	252,473	76,631	-101,481	-893	-25,743	-9.25
Farm Laborer	109,111	180,38	30,053	33,924	7,290	71,267	65.32
Serv. Occupa.	1,901,748	2,342,695	523,813	30,997	-113,863	440,947	23.19
Cleaning Occ.	397,160	553,820	109,393	79,191	-31,924	156,660	39.45
Food	581,092	874,117	160,055	177,542	-44,572	293,025	50.43
Protective	178,304	254,973	49,112	48,833	-21,276	76,669	43.00
Other	594,644	584,459	163,787	-86,124	-87,849	-10,185	-1.71
Private Hse	150,548	75,326	41,467	-115,002	-1,687	-75,222	-49.97

\*Component calculated by formula in Appendix B.



## APPENDIX K

 INDUSTRIAL STRUCTURE OF EMPLOYMENT FOR  
 THE WEST NORTH CENTRAL REGION  
 1970 - 1980

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Total U.S.	6,192,983	7,658,739	1,465,756	23.67
Agri. & Forest	593,835	567,343	-26,492	-4.46
Mining	43,411	54,559	11,148	25.68
Construction	353,272	429,835	76,563	21.67
Manufacturing	1,212,253	1,457,496	245,243	20.23
Total Durables	679,198	892,277	213,079	31.37
Furniture/ Lumber	39,382	58,604	19,222	48.81
Primary Metals	34,507	48,034	13,527	39.20
Fab. Metals	100,474	107,188	6,714	6.68
Machinery excep Electrical	166,004	257,783	91,779	55.29
Electrical	98,942	139,307	40,365	40.80
Motor Vehicles	123,283	147,880	24,597	19.95
Other Durables	116,606	133,481	16,875	14.46
Total Non- Durables	533,055	565,219	32,164	6.03
Food & Kindred	179,112	194,528	15,416	8.61
Textile Mills	55,239	53,430	-1,809	-3.27
Print/Publish	101,115	129,496	28,381	28.07
Chemicals	51,562	66,062	14,500	28.12
Other Non- Durables	146,027	121,703	-24,324	-16.66
Transportation	425,633	573,686	148,053	34.78
Railroads	82,664	83,577	913	1.10
Truck Service	102,768	145,817	43,049	41.89
Other transport.	65,634	137,232	71,598	109.09
Communication	76,287	103,369	27,082	35.50
Utilities	98,280	103,691	5,411	5.51

APPENDIX K -- Continued

INDUSTRY (A)	EMPLOYMENT 1970 (B)	EMPLOYMENT 1980 (C)	TOTAL CHANGE (D)	PERCENT CHANGE (E)
Wholesale Trade	280,147	375,733	95,586	34.12
Retail Trade	1,071,627	274,993	203,366	18.98
Food & Bakery	150,800	180,236	29,436	19.52
Eating/Drinking	207,117	346,845	139,845	67.46
General Merchan.	166,432	164,133	-2,299	-1.38
Motor Vehicles	161,107	172,081	10,974	6.81
Other Retail	386,171	384,698	-1,473	-0.38
FIRE	283,830	420,042	136,212	47.99
Banking & CU	97,493	154,866	57,373	58.85
Insurance/Real Estate	186,337	265,176	78,839	42.31
Services	1,928,975	2,505,052	576,077	29.81
Business Serv.	80,334	159,609	79,275	98.68
Repair Service	85,532	106,167	20,635	24.13
Priv. Household	81,326	41,999	-39,327	-48.36
Other Personal Services	184,199	187,682	3,483	1.89
Entertainment	43,546	60,101	16,555	38.02
Hospitals	250,622	371,712	121,090	48.32
Health Services	144,951	269,578	124,727	86.05
Elem. & Second.	516,216	654,418	138,202	26.77
Other Education	29,479	28,174	-1,305	-4.43
Welfare/Religious	104,345	174,841	70,496	67.56
Legal	129,968	123,484	-6,484	-4.99
Public Adminis- tration	278,457	327,187	48,730	17.50

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

APPENDIX K-1  
 EMPLOYMENT AND COMPONENTS OF CHANGE  
 FOR S/S -- 1981-1984  
 IN WEST NORTH CENTRAL REGION

INDUSTRY	EMPLOYMENT		% CHANGE	NAT'L SHARE	IND. MIX	LOCAL SHARE	% of 1984	COEF. SPEC.
	1981	1984						
Total	5,581,469	5,656,281	1.34	234,422	32,676	-192,286	100.00	1.00
Agriculture	18,755	21,396	14.08	788	2,569	-716	.37	.82
Mining	58,165	48,869	-15.98	2,443	-9,452	-2,286	.86	.68
Construct.	295,066	261,622	-11.33	12,393	-34,906	-10,917	4.62	.86
Manufact.	1,382,123	1,316,534	-4.75	58,049	-132,684	8,984	23.28	.94
Transpor.	356,307	359,748	.96	14,965	-27,329	15,784	6.36	1.06
Wholesale	465,595	457,748	-1.68	19,555	8,334	-19,043	8.09	1.17
Retail	1,207,912	1,231,022	1.91	50,732	32,855	-60,516	21.76	.06
FIRE	399,122	419,880	5.20	16,763	12,772	-8,781	7.42	10.00
Services	1,356,693	1,481,785	9.22	56,981	177,84	-109,078	26.19	1.00
Unclass.	41,731	57,713	38.30	1,753	19,947	-5,717	1.02	.90

APPENDIX K-1 (Continued)

TOTAL NUMBER OF BUSINES ESTABLISHMENTS AND PAYROLL DATA\*  
BY MAJOR INDUSTRY GROUP FOR 1981 AND 1984  
WEST NORTH CONTROL REGION

INDUSTRY	NO. OF ESTAB.		TOTAL CHANGE		% CHANGE		PAYROLL OF BUS. ESTAB. 1981	1984	TOTAL CHANGE	% CHANGE
	1981	1984	1984	1984	1984	1984				
Total	377,342	438,481	61,139	16.20	79,708,448	94,995,885	15,287,437	19.18		
Agriculture	3,898	4,828	930	23.85	221,627	285,596	63,969	28.86		
Mining	2,566	2,804	238	9.28	1,414,525	1,296,654	117,871	-8.33		
Construct.	35,075	37,274	2,199	6.27	5,554,735	6,035,471	480,736	8.65		
Manufact.	21,874	23,629	1,755	8.02	26,000,053	29,959,121	3,959,068	15.23		
Transport.	17,456	20,197	2,741	15.70	7,156,135	8,510,057	1,353,922	18.92		
Wholesale	39,169	40,837	1,668	4.26	8,170,006	9,363,159	1,193,153	14.60		
Retail	105,492	115,926	10,434	9.89	9,672,360	11,399,193	1,726,833	17.85		
FIRE	33,511	37,092	3,581	10.69	6,008,733	7,778,156	1,769,423	29.45		
Services	101,228	123,661	22,433	22.16	14,914,591	19,636,791	4,722,200	31.66		
Unclass.	16,969	32,233	15,264	89.95	397,657	731,687	334,030	83.99		

\* All data from County Business Patterns.

## APPENDIX K-2

EMPLOYMENT AND COMPONENTS OF CHANGE  
IN WEST NORTH CENTRAL REGION  
1970 - 1980

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Total	6,192,983	7,658,739	1,705,782	-59,514	-180,512
Agri. & Forest	593,835	567,343	163,565	-180,347	-9,710
Mining	43,411	54,559	11,957	15,391	-16,200
Construction	353,272	429,835	97,304	-7,109	-13,633
Manufacturing	1,212,253	1,457,496	333,900	-206,941	118,284
Total Durables	679,198	892,277	187,077	-86,525	112,527
Furniture/ Lumber	39,382	58,604	10,847	-744	9,119
Primary Metals	34,507	48,034	9,505	-6,773	10,796
Fab. Metals	100,474	107,188	27,674	-30,360	9,400
Machinery excep Electrical	166,004	257,783	45,724	18,940	27,115
Electrical	98,942	139,307	27,252	-11,987	25,099
Motor Vehicles	123,283	147,880	33,857	-17,266	7,906
Other Durables	116,606	133,481	32,118	-28,065	2,918
Total Non-Durables	533,055	565,219	146,824	-124,480	9,821
Food & Kindred	179,112	194,528	49,334	-30,885	-3,033
Textile Mills	55,239	53,430	15,215	-13,631	-3,393
Print/Publish	101,115	129,496	27,851	949	-419
Chemicals	51,562	66,062	14,202	663	-365
Other Non- Durables	146,027	121,703	40,221	-70,810	6,265
Transportation	425,633	573,686	117,235	44,475	-13,657
Railroads	82,664	83,577	22,769	-30,437	-8,582
Truck Service	102,768	145,817	28,306	15,739	-996
Other transport	65,634	137,232	18,078	43,496	10,024
Communication	76,287	103,369	21,012	5,079	991
Utilities	98,280	103,691	27,070	-20,290	-1,369

APPENDIX K-2 -- Continued

INDUSTRY (A)	TOTAL COVERED EMPLOYMENT		COMPONENTS OF CHANGE		
	1970	1980	NATIONAL SHARE	INDUSTRY MIX	LOCAL SHARE
Wholesale Trade	280,147	375,733	77,163	19,741	-1,318
Retail Trade	1,071,627	274,993	295,167	9,279	101,054
Food & Bakery	150,800	180,236	41,536	5,065	-17,165
Eating/Drinking	207,117	346,845	57,048	112,464	-29,784
General Merchan.	166,432	164,133	45,842	-45,446	-2,695
Motor Vehicles	161,107	172,081	44,375	-24,571	-8,830
Other Retail	386,171	384,698	106,366	-34,407	-73,432
FIRE	283,830	420,042	78,178	-74,125	-16,091
Banking & CU	97,493	154,866	26,853	43,095	-12,576
Insurance/Real Estate	186,337	265,176	51,324	31,534	-4,020
Services	1,928,975	2,505,052	531,313	171,872	-127,119
Business Serv.	80,334	159,609	22,127	66,609	-9,461
Repair Service	85,532	106,167	23,559	-3,568	644
Priv. Household	81,326	41,999	22,400	-53,064	-8,664
Other Personal Services	184,199	187,682	50,735	53,506	6,253
Entertainment	43,546	60,101	11,994	13,938	-9,377
Hospitals	250,622	371,712	69,031	92,616	-40,557
Health Services	144,951	269,678	39,925	78,297	6,505
Elem. & Second.	516,216	654,418	142,185	53,013	-56,996
Other Education	29,479	28,174	8,120	-5,400	-4,025
Welfare/Relig.	104,345	174,841	28,741	56,684	-14,929
Legal	129,968	123,484	35,798	28,184	-14,098
Public Adminis- tration	278,457	327,187	76,698	-14,015	-13,952

\*Employment data taken from Bureau of the Census,  
Department of Commerce 1970 and 1980 Census Data

## APPENDIX K-3 and 4

 OCCUPATION OF EMPLOYED PERSONS\* AND  
 COMPONENTS OF CHANGE FOR S/S  
 WEST NORTH CENTRAL REGION  
 1970-1980

	1970	1980	NET SHARE EST. 1970	IND. MIX EST. 1970	LOCAL SHARE 1970	TOTAL CHANGE REGION	% CHANGE
Region Total	6,192,983	7,658,739	1,705,782	34,151	-274,177	1,465,756	23.60
Manage/Prof.	1,400,794	1,852,335	385,832	200,229	-134,520	451,541	32.23
Mrgs & Adminis.	539,104	743,060	148,490	169,871	-114,405	203,956	37.83
Prof. Special	861,960	1,109,275	237,342	39,888	-29,645	247,585	28.73
Engineers	70,000	126,936	19,281	3,397	2,258	56,936	81.34
Physicians	43,483	46,468	11,977	-3,505	-5,487	2,985	6.86
Health Workers	102,968	140,658	28,361	13,568	4,239	37,690	36.60
Teachers	217,856	379,530	60,006	123,101	21,433	161,674	74.21
Other Tech.	427,483	415,683	117,745	-119,406	-10,139	-11,800	-2.76
Sales Occupa.	429,909	762,491	118,413	222,527	8,359	332,582	77.36
Clerical	1,084,300	1,227,784	298,657	-53,617	-101,556	143,484	13.23
Craftsmen	772,679	920,463	212,825	-68,154	3,113	147,784	19.13
Operators	672,480	606,559	185,226	-275,633	24,485	-65,921	-9.80
Transportation	238,028	274,754	65,562	-38,904	10,068	36,726	15.43
Laborers	257,469	414,561	70,917	83,765	2,410	157,092	61.01
FM MGR & Lab	560,730	549,351	154,446	-52,715	-113,110	-11,379	-2.03
Farm Manager	444,106	388,103	122,324	-161,991	-16,336	-56,003	-12.61
Farm Laborer	116,624	161,248	32,123	36,260	-23,759	44,624	38.26
Serv. Occupa.	836,594	1,050,441	230,430	13,636	-30,218	213,847	25.56
Cleaning Occ.	159,955	227,899	44,058	31,894	-8,008	67,944	42.48
Food	269,882	393,798	74,336	82,458	-32,877	123,916	45.91
Protective	53,160	79,934	14,642	14,559	-2,428	26,774	50.36
Other	272,365	312,063	75,020	-39,447	4,126	39,698	14.58
Private Hse	81,232	36,747	22,874	-62,052	-4,807	-44,485	-54.76

\*Component calculated by formula in Appendix B.

APPENDIX L  
COEFFICIENT OF SPECIALIZATION

The coefficient of specialization is a method used to determine basic industries in a particular industrial structure. The calculation of the coefficient is as follows:

$$\frac{\text{Total Employment in the Region in the Industry}}{\text{Total Regional Employment}} \quad \cdot \quad \frac{\text{Total Employment in the Nation in the Industry}}{\text{Total National Employment}}$$

It is assumed that the industries with a coefficient of greater than one are basic industries, and those industries with a coefficient of less than one are nonbasic.

This coefficient was used in Chapter IV to determine basic industries in each region's industrial structure. This coefficient of specialization is only one way among many to determine a region's basic industries.



APPENDIX M  
 COEFFICIENTS OF SPECIALIZATION/LOCALIZATION\*  
 FOR UNITED STATES INDUSTRIES  
 BY GEOGRAPHIC REGIONS

1980

INDUSTRY	GEOGRAPHIC REGIONS OF THE UNITED STATES								
	NE	MA	ENC	WNC	SA	ESC	WSC	PAC	MT
Agriculture/Forestry	.45	.44	.88	2.62	.99	1.18	1.43	1.17	1.44
Mining	.09	.41	.49	.68	.78	1.67	3.40	.36	3.15
Construction	.77	.73	.77	.95	1.20	1.11	1.43	1.01	1.34
Manufacturing	1.26	1.08	1.29	.85	.92	1.12	.79	.87	.54
Transportation	.80	1.09	.92	1.03	.99	1.02	1.06	1.01	1.05
WHolesale Trade	.84	1.03	.95	1.14	.92	.98	1.15	1.03	.94
Retail Trade	.95	.94	1.01	1.01	.99	.95	1.02	1.04	1.08
FIRE	1.06	1.16	.91	.91	.95	.78	.93	1.15	1.03
Service	1.05	1.06	.94	.85	4.27	.25	1.01	1.19	1.31

\*Coefficients of Specialization computed by mathematical formula in Appendix L.

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