



**Successful Adjustment to Economic
Restructuring in the Nonmetro
Northeast: 1950-1990**

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October, 2002

Rural Development Paper No. 13

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Successful Adjustment to Economic Restructuring in the Nonmetro Northeast: 1950-1990

*Stephen M. Smith and Kathleen Miller**

Abstract: Changes in the economic structure of rural America have caused continuing concern about the ability of rural areas to maintain an employment base and viable, dynamic economies. This study finds that the vast majority of Northeast nonmetro counties had both employment and income growth throughout the 1950-1990 period. Counties that were most likely to be successful underwent shifts from traditional resource and manufacturing economies to service and diversified structures. While the results support previous research showing that economies which do not shift to growing industrial sectors will fall behind, a key result is the importance of a diversified economy.

I. INTRODUCTION

The impacts of changes in the economic structure in rural America from agriculture and natural resources to manufacturing, and currently to services, have been the overriding theme in rural areas since the 1950s. These well-documented changes seem to strike relentlessly at the economic bases of rural areas. After a brief respite in the 1970s, secular decline returned in the 1980s, and remained problematic through the early 1990s (Reid and Long 1988; Falk and Lyson 1991; Henry 1993). Historically, the "rural problem" has stemmed from the long run decline in agriculture and other natural resource-based industries, on which rural economies initially were based. While this trend continued in the 1980s (Economic Research Service 1993), the nature of the rural economy had changed sufficiently that the principal cause of economic stress in much of nonmetropolitan America in the 1980s was attributed to the poor performance of rural manufacturing (Brown and Deavers 1988; Long 1988; Reid and Long 1988). At the same time, another major structural shift was taking place. From 1975 to 1989, 89 percent of the net employment growth in nonmetropolitan counties was in service-producing industries. By 1989, two-thirds of the employment in nonmetro counties was in these industries (Smith 1993).

Transitions in economic structure are a natural product of economic change, to which all societies must adapt (Fisher 1935; Kuznets 1966; Singlemann 1978). The continuing concern -- in the rural communities, by government at all levels, and in academic studies -- is about the ability of rural areas to successfully adjust to these changes in economic structure; to maintain an employment base and a viable and dynamic economy (Drabenstott and Smith 1995). Previous work has documented the broad shifts in county industrial structure from extractive industries to manufacturing and later to service industries (Bender et al. 1985; Cook and Hady 1993). These studies, however, did not examine the particular adjustment patterns that took place, the extent to which these adjustments resulted in maintaining the employment and income base, and what factors may be related to a "successful" adjustment.

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The Northeast United States¹ provides a particularly good case study of these adjustments, as the region began the transition from an agricultural base earlier, and has undergone the range of structural change more completely than other regions². Following World War II, extractive industries were replaced by manufacturing as the dominant employer of the rural Northeast. In 1950, only 53 of the 177 nonmetro counties (1974 Beale code definition) could be considered specialized in agriculture (Kreahling 1994). By the 1970s, no Northeast nonmetro counties were dependent on agriculture, and manufacturing dominated (Bender et al. 1985; Kreahling 1994). During the 1970's and early 1980's, however, much of this manufacturing employment was lost to other regions and other countries. The Northeast was the only region during the 1970s to show a decrease in manufacturing employment (Taylor 1983). Manufacturing employment between 1970 and 1990 declined dramatically, while service employment grew. The downward trend in manufacturing is expected to continue in the Northeast, contrary to the rest of the nation (Crandall 1993). These transitions affected rural areas in different ways; some communities adapted to these changes, while others experienced continuous economic stress.

The purpose of this study is to examine the specific types of economic transitions that occurred from 1950 to 1990 in nonmetropolitan counties in the Northeast, and to determine the role these transitions and other factors played in whether or not counties successfully adapted. There are two specific research objectives. The first is to identify the specific types of economic transitions that occurred. The transitions will be identified through an examination of how the county employment structure changed from 1950 to 1970 and 1970 to 1990. The second objective is to use regression analysis to determine factors related to the success that rural Northeast counties had in adapting to the economic transitions. A definition of success is developed, based on changes in employment and income in the counties over the 40-year period.

II. THE CONTEXT: CHANGING ECONOMIC STRUCTURE

Three issues form the context, or motivation, for this study. One derives from the historical literature on the structural changes in national economies, and implications for economic progress. The second is a more pragmatic, “grassroots” concern with transitions away from traditional rural economic bases, and the commonly-perceived negative effects of these changes on rural employment and income. A third is the influence of a diversified economic structure on the economic welfare of rural areas.

The structural shifts of national economies, with international comparisons, has been a topic for decades among those concerned with economic change and growth. Early investigation was by

¹Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia.

²For example, by 1950 only 5.2 percent of Northeast employment was in agriculture, vs. 18.3, 28.6, and 15.6 percent in the North Central, South, and West regions, respectively (Taylor 1983). In nonmetro counties in 1970, the traditional rural resource-based industries of agriculture, forestry, fisheries and mining made up only 5.2 percent of total Northeast nonmetro employment vs. 13.2, 10.5, and 13.7 percent in the other regions (Hines, Brown and Zimmer 1975). Furthermore, nonmetro manufacturing, the industry that replaced much of the lost nonmetro extractive employment from 1950-1980, declined by 15 percent in the Northeast during the 1980s, vs. a 0.8 percent decline in the Midwest and increases in the other regions (Economic Research Service 1993).

A.G.B. Fisher (1935) and Colin Clark (1940), who classified economies into primary, secondary and tertiary sectors. The primary sector is composed of agriculture, forestry, fishing and mining; the secondary of manufacturing, construction and utilities; and the tertiary of the wide spectrum of service industries. In the course of economic development it is assumed that there is a sequential shift of employment from agriculture and other extractive industries to manufacturing, and finally to services (Singlemann 1978). According to Fisher, the shifts of employment toward secondary and tertiary production are the inescapable reflection of economic progress. Clark found a firmly established generalization within countries that a high average level of real income per head was always associated with a high proportion of the working population engaged in tertiary (services) industries.

Kuznets (1966) and Singlemann (1978) extended this research to the post-World War II industrial economies. Kuznets states that modern economic growth is characterized by rapid shifts in the industrial structure of product, and consequently by rapid shifts in shares of labor attached to various sectors (p. 493). These shifts are necessary to attain high rates of economic growth. Singlemann concurs, concluding that in advanced industrial countries after World War II, the level of per capita income is primarily associated with an increase in the proportion employed in social and producer services. Thus, the implication is that a "successful" modern economy is a positive function of shifts away from the previous structure, initially the extractive industries, and later away from manufacturing.

The changes in economic structure documented at the national and international levels have been equally as great in rural areas of the United States. The structural transformations that have taken place in rural economies over the past several decades have raised concern about the ability of local economies to successfully adapt to changes; to maintain population, employment and income levels. A constant focus is the extractive sectors of agriculture, mining and forestry, which historically characterized rural economies. Employment in agriculture decreased approximately five-fold from 1950 to 1990, and mining employment, though fluctuating, has become a minuscule part of the rural economy (Mills 1995). Income in these sectors also has shown annual compound real rates of decrease in rural U.S. as a whole (Weber 1995). The changes occurring in the economies of rural areas have influenced the movement of population into and out of nonmetro areas. Between 1950 and 1970, over half of all nonmetro counties in the United States declined in population. Beale (1990) notes a relationship between population change and the dependence of an area on agriculture and mining. For example, 94 percent of the counties in the North Central Region with 50 percent or more of workers employed in agriculture or mining in 1960 witnessed population decreases during the 1960's. Beale found a 0.56 percentage point decline in population for every percentage point increment in employment in agriculture and mining. Conversely, during the same decade, population increased in the 84 percent of counties with less than 20 percent of workers employed in agriculture or mining.

Many rural communities found manufacturing to be a successful replacement for declining extractive industry employment. The decentralization of manufacturing following World War II created an abundance of job opportunities for rural residents displaced by declines in agriculture and other natural resource industry sectors (Barkley 1993). However, trends in manufacturing employment reversed after the late 1970's. Many manufacturing firms relocated in other regions or other countries, and many rural workers were once again displaced. During the recession of the

1980's, for example, rural areas, which accounted for about a quarter of all manufacturing employment before the recession, absorbed half of all manufacturing job losses (Reed, 1989).

Service industries have been on the increase since the 1960's, possibly offering opportunities to rural workers displaced by declines in manufacturing employment (Smith 1993; Glasmeier and Howland 1995). Although service sector employment has grown considerably in nonmetro as well as metro areas, the types of services growing in each region are quite different. Most of the service sector growth in rural areas has been in low-wage and part-time jobs (Glasmeier and Howland 1995). Porterfield (1990) shows that during the early 1980's, rural areas gained in lower-paying service sectors, such as eating and drinking places and grocery stores, while losing in manufacturing, natural resources, and construction, which are relatively higher-paying sectors. Miller and Bluestone (1988) studied location quotients for 45 service industries, and found only 10 to be rural-oriented. These included primarily low-paying service sectors. Seven service industries were identified as ubiquitous, and the remaining 28 were identified as urban and large urban-oriented. The higher-paying services tend to agglomerate in urban areas, where an adequate market and specialized labor can be found (Miller and Bluestone, 1988). This is also one of the main conclusions drawn by Glasmeier and Howland (1995). Thus, it appears that most rural residents are missing out on the growth of high-paying service jobs, and are left with few other opportunities.

Because employment opportunities are an important determinant of incomes, shifts in the industrial structure of a rural economy also may have a direct influence on income levels. Contrary to the Fisher-Clark-Kuznets-Singlemann conclusions for nations as a whole, there is the perception that the rise in service employment has affected rural incomes adversely, because rural services tend to be low-wage and/or part-time (Bloomquist et al. 1993; Gorham 1992; Lichter and McLaughlin 1995). Tomaskovic-Devey (1987) studied the relationship between poverty rates and the structure of economic opportunity in South Carolina counties. He found that the volume of agricultural sales was highly significant and positively related to poverty, while the proportion of employment in service industries was found to be only slightly significant but positive. Williams (1991) found that the hypothesis that poverty is likely to be higher in the service sector is true only in comparison to transformative (manufacturing and construction) industries, not extractive industries. Thus, the income impacts of the shift to services are somewhat ambiguous.

This leads to the third context for the paper – the role of a diversified economic structure. The need for and the impacts of diversification is a more recent focus of research. In nonmetro areas the interest in economic diversification has increased because of unstable and generally declining employment opportunities in the traditional resource-based and manufacturing industries, upon which rural areas depend more heavily than metro areas.

The research on diversification has focused primarily on the link between regional economic welfare (lower unemployment, increases in employment and income, and the stability of those measures) and the diversity of the economic structure. The main theoretical context used has been portfolio theory, where trade offs among those goals have been examined (Board and Sutcliffe 1991; Brown and Pheasant 1985, 1987; Harper and St.Louis 1999; Lande 1994; Malizia and Ke 1993; Schoening and Sweeney 1992; Smith and Gibson 1988). Local development policy in this context leads to a focus on an economic structure that meets both the goals of stability and growth. The overall conclusion of this literature is that the goals would be attained by maintaining a more diverse economic structure.

A key aspect of this literature that relates to the first two contexts presented above is that an economic structure that is both competitive and diverse is important (Malizia and Ke 1993). That is, the portfolio of industries must also include those that are growing. Diverse areas tend to have more industries that can remain relatively healthy during difficult times and retain their employment levels. As change occurs, the presence of other industries allows workers losing jobs in declining industries to gain them in the newer, growing, more competitive industries.

III. DATA AND METHODOLOGY

The study covers the 177 nonmetropolitan counties in the Northeast United States (1974 Beale Code designation), which includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia. Data were obtained from the Census of Population for 1950, 1960, 1970, 1980 and 1990.

The first objective of this study is to identify and examine the economic transition patterns in each nonmetropolitan county of the region. A transition is defined as a shift in the dominant industry of the county between census years, where the dominant industry is defined in terms of the percent of total county employment in the industry. A county may have experienced one or more transitions over a time period, or may have remained specialized in the same industry.

Five broad industry sectors were examined: (1) Agriculture, forestry and fisheries, (2) Mining, (3) Manufacturing, (4) Ubiquitous Services and (5) Producer Services. Aggregations in the Census of Population did not allow a more detailed industrial classification. The 1980 and 1990 Censuses only disaggregate manufacturing to durable and nondurable manufacturing. Agriculture, forestry, and fisheries are aggregated with mining in the 1980 Census. For 1980, then, employment in each of agriculture, forestry and fisheries, and in mining was calculated as the average of 1970 and 1990 employment.

Although the Census does provide a more disaggregated classification of the services sector, only two groups of services are used in this study, ubiquitous and producer. Ubiquitous services include wholesale and retail trade; personal, entertainment and recreation services; health services; education services; and transportation, communications and public utilities. Producer services include finance, insurance and real estate; business and repair services; and professional and related services. Such a classification, although still somewhat aggregated, will allow comparison with earlier research that found per capita incomes positively associated with shifts to producer services (Singlemann 1978).

Employment levels at which a county is considered specialized in an industry were selected with three criteria in mind. First, the employment level had to be sufficiently high to ensure that the county was indeed specialized in that industry sector. Second, there had to be a sufficient number of counties specialized in the industry to permit statistical analysis. Third, overlaps between industries were to be minimized. The employment specialization levels are as follows:³

³Other, but similar categorizations can be found in Bender et al. (1985) for the nation as a whole, and in Smith and Gibson (1988) for a single state.

Agriculture, Forestry and Fisheries	20 percent of total employment
Mining	20 percent of total employment
Manufacturing	25 percent of total employment
Ubiquitous Services	50 percent of total employment
Producer Services	20 percent of total employment

The dominant industry in each county in 1950, 1960, 1970, 1980, and 1990 was determined. Counties that did not meet the requirement for any of these five industry sectors were defined as diversified. Counties that met the requirements for more than one industry were placed in the industry with the higher percent of total employment.

The second objective of the study is to determine the relationship of type of economic transition undergone, plus certain county characteristics, to success in adapting to economic transitions. Success is measured by percent change in (1) total county employment, and (2) real median family income (in 1983 dollars). A “successful” county is defined as one that has experienced growth in either of these two measures equal to or greater than the mean percent change of all nonmetro counties in the region. The mean percent change was chosen as the standard because all Northeast nonmetro counties had overall employment growth, and too few counties had income decreases to permit statistical analysis. Success is measured, therefore, relative to other nonmetro counties in the region. Drabentstott and Smith (1995) recently have used this same definition of success in connection with their examination of rural economic change.

IV. PATTERNS OF ECONOMIC TRANSITIONS AND SUCCESS

Both employment and income measures are used because success in one may not necessarily imply success in the other. As the economic structure changes, employment may increase in certain industry sectors, but this may be in industries or jobs that pay less than the previous employment sources. That is one of the concerns motivating research by Bloomquist et al. (1993), Drabentstott and Smith (1995), Gorham (1992), and Lichter and McLaughlin (1995). Thus, factors related to both employment and income success will be examined.

Table 1 shows that, in general, Northeast nonmetro counties could be termed to have adapted “successfully,” despite major structural changes and declines in the traditional economic bases of agriculture, forestry, mining and manufacturing. These counties experienced impressive increases in real median family income and employment from 1950 to 1990. Table 1 also shows, however, distinct differences both between the success measures and the 1950-1970 and 1970-1990 sub-periods. The mean percent change in real family income for all nonmetro counties in the Northeast was 143.6 percent from 1950-1990. Most of this occurred during 1950-1970, when the increase was 115.4 percent. The increase from 1970 to 1990 was only 12.3 percent. For counties both above and below the mean income change, average income changes were positive and strong for the entire period, and for 1950-1970. For 1970-1990, the average annual change in median real family income was 23.9 percent for counties above the mean. For counties below the mean, the average annual real income change was only 2.3 percent.

TABLE 1
Mean Percent Change in Real Median Family Income (1983 dollars)
and Total County Employment Among Northeast Nonmetro Counties

Employment	All Nonmetro Counties		Nonmet. Co. Above Mean		Nonmet. Co. Above Mean	
	Income	Employment	Income	Employment	Income	Employment
1950-1990	143.6% (n=177)	75.4% (n=177)	195.6% (n=74)	162.4% (n=67)	106.3% (n=103)	22.4% (n=110)
1950-1970	115.4 (n=188)	11.4 (n=177)	142.0 (n=78)	34.6 (n=85)	94.4 (n=99)	-10.1 (n=92)
1970-1990	12.3 (n=177)	50.1 (n=177)	23.9 (n=82)	85.4 (n=71)	2.3 (n=95)	26.4 (n=106)

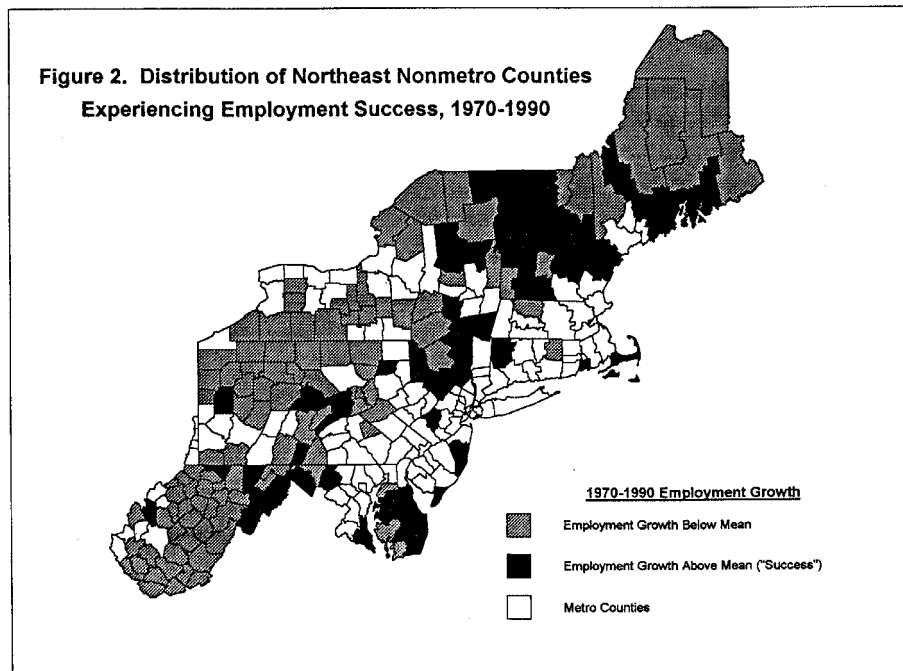
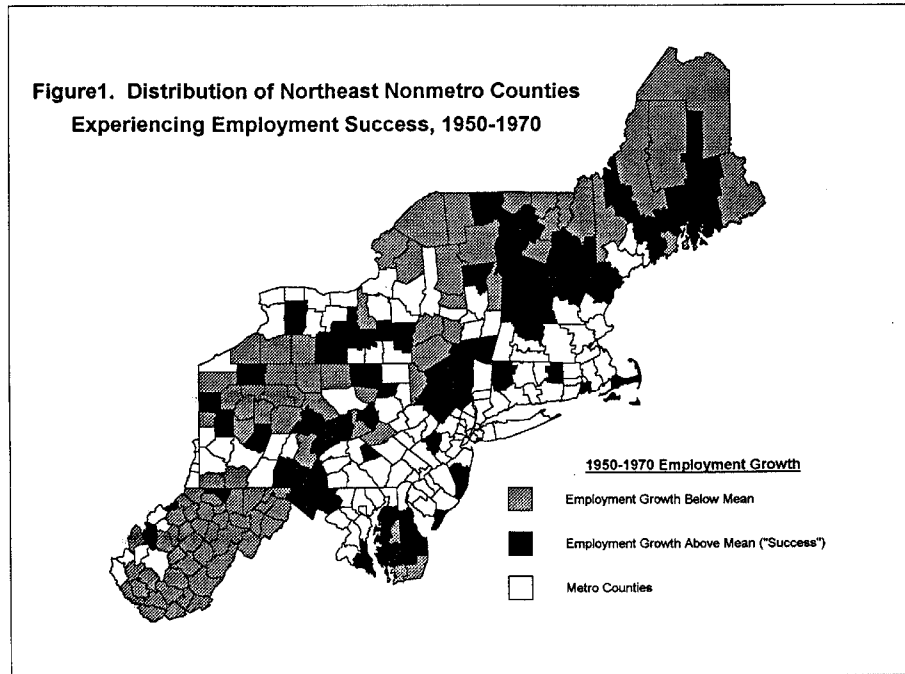
The mean percent employment change among all nonmetro counties over the 1950-90 time period was 75.4 percent. Among nonmetro counties with employment change greater than the mean, the average employment change was a 162.4 percent increase. Even among counties below the mean, the average change was a 22.4 percent increase. During the first part of the time period (1950-1970), however, the mean among all counties was much lower (11.4 percent), and was negative among counties below the mean. The 1950-1970 decades were characterized by large declines in agricultural and mining employment, and movement of population out of rural areas. During the 1970s (the decade of the population turnaround) and the 1980s, mean employment change increased to 50.1 percent, and both groups of counties (those above and below the mean) had positive average employment changes.

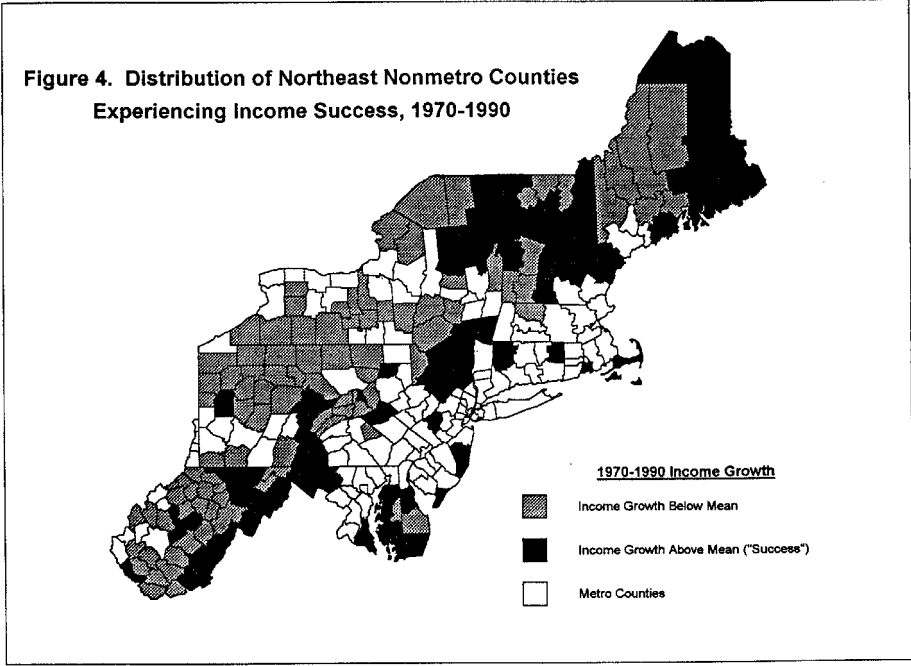
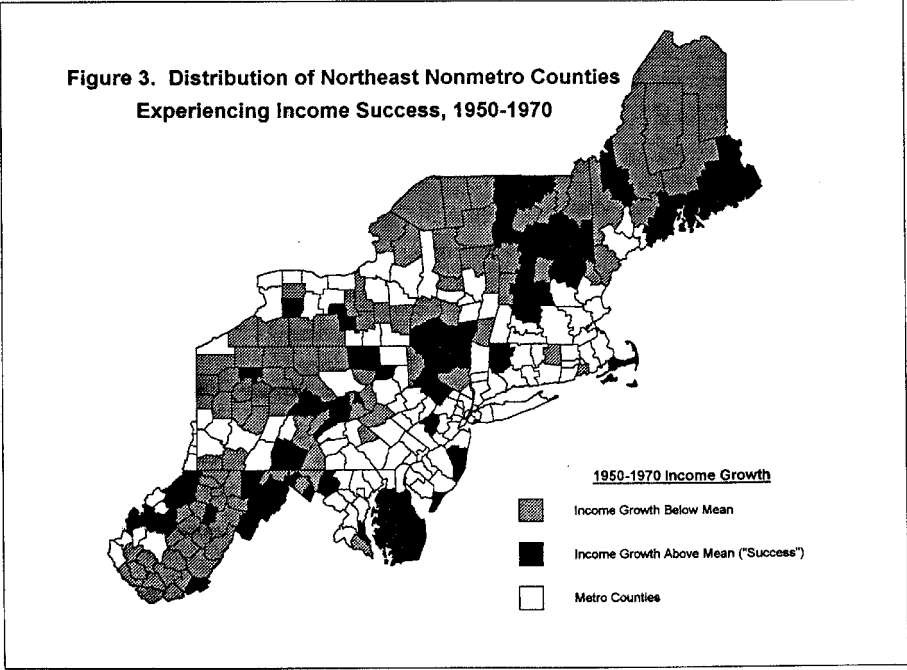
The 1950-70 period was one of great changes from the extractive economic base. Employment increased only slightly, but the average real median family income increased greatly. Even in the counties below the mean, where average employment decreased, real median family income almost doubled. An explanation is that in this period the structural change was from a low-income agricultural economy to higher paid manufacturing jobs, as well as the remaining agriculture being more profitable. Because of the large losses in agricultural employment in all counties, net employment increases were not large, but the average income per family increased considerably.

The 1970-1990 period, on the other hand, had sizeable employment growth, but only slight real income growth. The 1970s were years of growth, but the 1980s were years of general decline and stagnation. In the latter part of the period, the losses were in the higher paid manufacturing jobs, and the large gains were in the service industries, but not in the high paid producer services (see Table 2). Also, while manufacturing employment decreased generally in the region, several counties had net manufacturing increases. The types of jobs, however, were in the lower paying industries. These income/employment growth differences corroborate previous research conclusions that, while employment may be growing, it often takes two wage earners in a family to maintain a middle-class life style (Bluestone and Harrison 1988; Gorham 1991; Levy 1988; Oregon 1984)

Figures 1 to 4 show the distribution of the successful and unsuccessful counties. The counties having employment growth above the mean are grouped similarly in both time periods, generally near the major metropolitan areas of Washington/Baltimore/Wilmington, New York, and New England. The 1950-1970 employment success counties are somewhat more dispersed than in the 1970-1990 period, and include counties in western parts of Maryland, Pennsylvania, and New

York. A change in the latter period is that a group of employment-success counties appears in eastern West Virginia. The income-success counties are distributed somewhat similarly, though more concentrated. An interesting difference is that West Virginia in both periods had income-success counties that were not employment-success counties.





The number of Northeast nonmetro counties specializing in each industry sector in each census year 1950 to 1990 is shown in Table 2. The number of extractive industry counties declined dramatically between 1950 and 1990. In 1950, 74 counties were specialized in either agriculture, forestry and fisheries, or mining. In 1990, only three counties were specialized in mining, and none in agriculture, forestry and fisheries. The total number of manufacturing-specialized counties increased

from 74 in 1950 to 100 in 1970, but dropped to 39 by 1990. In 1950, only four counties were specialized in services, increasing to 26 in 1970, and 72 by 1990. No counties were specialized in producer services until 1990, when seven made this transition (most near the Boston metro area.)

TABLE 2
Number of Northeast Nonmetropolitan Counties Specialized in each Industry Sector

	1950	1960	1970	1980	1990
Agriculture, forestry fisheries	53	17	1	0	0
Mining	21	13	8	5	3
Manufacturing	74	97	100	78	39
Ubiquitous Services	4	7	26	38	72
Producer Services	0	0	0	0	7
Diversified	25	43	42	56	56

A more detailed view of the transitions and their relationship to employment and income success is shown in Table 3. The tables show particular transitions of industry specialization, categorized by employment and income success (percent change above or below the mean) for the 1950-1970 and 1970-1990 periods. In general, these results conform to the Fisher/Clark/Kuznets/Singlemann literature, which shows that economies not shifting to the growing industries of a particular era (manufacturing in 1950-1970, and services/diversified in 1970-1990) will tend to fall behind or stagnate. Clearly, however, undergoing a transition does not explain all of success, or lack of, as not all counties that make a particular transition are either successful or not.

In each period, the large majority of counties that did not shift from specialization in the traditional industry (extractive in the early period and manufacturing in the later period) were not successful in both employment and income. A majority of counties initially specialized in extractive industries had employment increases below the mean, regardless of type of transition, but those shifting to manufacturing and diversified specializations had income changes above the mean. However, even in the 1950-1970 period, there were indications that maintaining a manufacturing specialization was not sufficient to guarantee “success”. A majority were successful in employment increases above the mean, but this was decidedly not the case for income. The shifts to services in both periods had mixed results. This likely reflects the fact that the service growth was in the lower paying ubiquitous category⁴. In the 1970-1990 period, the counties initially manufacturing specialized had distinctly weaker performances than the diversified and services counties, in both employment and income change. Counties maintaining a diversified economy were generally more successful. Again, however, it is clear that a particular transition did not completely explain success.

⁴The two service categories, ubiquitous and producer, were combined because no counties became specialized in producer services through 1980, and only seven by 1990 (and most of these were concentrated around the Boston metro region).

TABLE 3
Number of Northeast Nonmetropolitan Counties Experiencing Employment and Income Success, 1950-1970,
by Type of Economic Transition.

Transition Pattern		Employment Change 1950-1970		Income Change 1950-1970	
		Above Mean	Below Mean	Above Mean	Below Mean
Extractive (no shift)	<i>n=9</i>	1	8	1	8
Extractive & Manufacturing	<i>n=28</i>	9	19	20	8
Extractive & Diversified	<i>n=28</i>	10	18	16	12
Extractive & Services	<i>n=9</i>	3	6	2	7
Manufacturing (no shift)	<i>n=67</i>	38	29	20	47
Diversified (no shift)	<i>n=12</i>	8	4	6	6
Diversified & Services	<i>n=9</i>	5	4	4	5
Other transition patterns ^a	<i>n=15</i>	11	4	9	6
Total	<i>n=177</i>	85	92	78	99

Transition Pattern		Employment Change 1970-1990		Income Change 1970-1990	
		Above Mean	Below Mean	Above Mean	Below Mean
Manufacturing (no shift)	<i>n=39</i>	10	29	11	28
Manufacturing & Diversified	<i>n=33</i>	14	19	16	17
Manufacturing & Services	<i>n=28</i>	10	18	10	18
Diversified (no shift)	<i>n=20</i>	13	7	16	4
Diversified & Service	<i>n=22</i>	11	11	13	9
Services (no shift)	<i>n=25</i>	11	14	14	11
Other transition patterns ^a	<i>n=10</i>	2	8	2	8
Total	<i>n=177</i>	71	106	82	95

^aThis category contains a variety of transitions, including counties making three shifts over 20 years, that were too few to permit statistics analysis.

V. REGRESSION MODELS

To further explore the factors related to success in responding to industrial restructuring, regression models were developed. As Table 3 clearly show, the economic transitions by themselves do not entirely explain success or lack thereof. A second set of variables, drawn from previous research and location theory, is added to examine the influence of transitions in the presence of other explanatory factors. Thus, success in employment and income growth is hypothesized to be a function not only of the type of economic transition in a county, but also of several characteristics of the county and county population.

EMPLOYMENT SUCCESS = f (Economic transition, Metro adjacency status, Median age of population in base year, Education level of population in base year, Women's labor force participation rate change)

INCOME SUCCESS = f (Economic transition, Metro adjacency status, Median age of population in base year, Education level of population in base year, Percent employment change over the time period, Women's labor force participation rate change)

Logit models will be estimated with employment or income success equal to one if a county experienced a percent change in total county employment or real median family income equal to or greater than the mean percent change of all nonmetro counties in the region, and zero otherwise (from Table 1). Success will be examined for the 1950-1970, and 1970-1990 sub-periods. There are several reasons for this division. First, there are distinct differences in the patterns of population change between these two time periods, which are related to employment change. The first two decades of the time period were characterized by the movement of population out of rural areas toward cities, while the 1970s were characterized by relatively rapid movement of population into rural areas.

Second, employment trends in individual industries were different in the two time periods. During the 1950s and 1960s, employment in agriculture declined rapidly as a result of labor-saving technologies (Reimund and Petrusis 1988). Mining employment declined during the 1950s and 1960s due to technological change, increased competition, and reduced demand, then coal mining employment rebounded in the 1970s due to the oil crisis (Weber, Castle and Shriver 1988; Weber 1995). Growth in the service sectors did not begin to accelerate until the 1960s, and shifts toward services are not common until after 1970 (Smith 1993). Growth in nonmetro manufacturing employment during the 1950s and 1960s was substantial, as manufacturing decentralized out of urban centers toward rural areas with cheaper land and labor (Barkley 1993). During the 1970s and 1980s, manufacturing industry began to move out of the Northeast, causing dramatic declines in manufacturing employment, particularly in the 1980s.

Third, using the two sub-periods separately allows the examination of transition categories which occurred in too few counties over the whole 1950-1990 time period. For example, only three nonmetro counties remained specialized in mining over the whole time period, so these counties cannot be analyzed as an independent group. However, between 1950 and 1970, nine nonmetro counties remained specialized in extractive industries (one in agriculture, forestry and fisheries, and eight in mining). Likewise, only two nonmetro counties remained specialized in services over the whole time period, but between 1970 and 1990, 25 nonmetro counties remained specialized in services. The regression models will therefore contain different sets of transitions.

The economic transitions are measured as dummy variables, each equal to one if the county experienced the particular economic transition, and zero otherwise. The transitions are identified through objective one. Only those transitions that occurred in a number of counties sufficient for analysis are included, with all others grouped together. The use of the transitions is based on conclusions by Clark (1940), Kuznets (1966) and Singlemann (1978) that economic progress only comes through transitions from the previous structure to the growing sectors of a particular era. In this context a key transition hypothesized to relate to “success” in the first time period is from extractive-based activities to manufacturing. In the second time period, greater success should be related to transitions from manufacturing to service or diversified structures.

Measures of adjacency classify nonmetro counties as being adjacent to a small, medium, large, or not adjacent to, a metro area⁵, based on 1974 Beale Codes. Counties adjacent to metro areas are expected to be more successful in terms of employment and income growth. Rapidly growing producer services generally have agglomerated in metro areas, and decentralization of these

⁵Large metro areas are those with a population of 1,000,000 or more in 1974. Medium metro areas are those of population between 250,000 and 1,000,000. Small metro areas are those of population less than 250,000.

producer services would most likely occur in adjacent nonmetro areas (Smith 1993; Glasmeier and Howland 1995). Adjacent nonmetro counties also may have the advantage over nonadjacent counties in the decentralization of high-technology manufacturing. Such manufacturing facilities require highly skilled labor, and adjacent counties can offer such labor as well as cheaper land, lower taxes, and proximity to urban markets. Recent research supports these hypotheses about such “spillover” effects (Barkley et al. 1994; Henry and Drabenstott 1996). On the other hand, Tweeten and Brinkman (1976, p. 435) suggested that the largest metropolitan areas will not have a positive influence on the success of adjacent nonmetro counties. They argued that cities of over one million population experience diseconomies in providing services for and meeting the needs of the metro population, and thus are ineffective growth centers.

The next set of variables - population age and education, and women’s labor force participation -- are based on standard location theory (Richardson 1979), which identifies key production factors driving industry location. These variables are proxies for the availability and quality of labor. That is, can an area supply the needed labor? The availability and quality of a local labor force is important during changes in the economic structure. Skill requirements change, and there must be a fit for the newer industries to take hold. For example, for industries seeking lower skilled workers to perform routine manufacturing operations, or fill low-level service positions, the availability of workers is the critical issue. For higher technology manufacturing, or producer services, a more highly educated labor force is demanded.

The first labor force measure, median age of the population in the base year, is expected to have a negative impact. In many rural counties, the median age of the population is increasing because much of the working age population has migrated out of the county, and the phenomenon of “aging in place” characterizes the demography. Such counties would be less successful in attracting economic activity. The exception may be counties with large retirement populations, which may have experienced growth in many services for the aging population.

The median education of the population in the base year is expected to have a positive effect on employment and income growth. Industries with low skill requirements also experienced growth during the time period, so the relationship may not be linear. In the first time period (1950-1970), counties with low education levels may still have experienced substantial growth in manufacturing, but in types which required low-skilled labor. In the second time period (1970-1990), though, growth in low-skilled manufacturing was not as widespread, and the growing industries required a more highly-skilled workforce. At the same time, the considerable growth of the broad services industries in the 1970-1990 period would provide increased employment opportunities for lower skilled workers.

In addition to the standard factors expected to influence employment and income change, a major social change occurred after World War II. This is the increase in women working outside the home, particularly married women. The percentage of women participating in the labor force increased from 39 percent in 1965 to 58 percent in 1993 (Hayghe 1994). Both labor demand and labor supply issues will be involved in determining whether or not this factor influences the employment and income success of a county. Within the context of labor supply as a factor in growth of economic activity, the availability of women is a significant factor. As discussed earlier, lower paying service industries grew the most in rural counties, and these tend to employ more women. Also, there is evidence that lighter assembly locates where women are available (Smith and Barkley 1989). On the labor demand side, as there is growth in the industries that employ more

women, this would attract them into the labor force, leading to increased employment and income. The increasing role of services in the economy is particularly relevant here, as women more frequently work in service industries. (Economic Research Service 1992). As rural job opportunities declined in the traditionally male-oriented industries, rural families increasingly relied on the earnings of women. The expectation is that increased women's labor force participation will positively contribute to employment and income success.

The percent change in total county employment is expected to positively influence income success. Areas that experienced employment growth would also experience income growth. The choice of this variable is based on conclusions by Clark (1940), Kuznets (1966) and Singlemann (1978) that the new and growing industry sectors at any given time are associated with newer (higher) skills and thus higher wages. In the 1950-70 period, this would have been in manufacturing, and in the 1970-90 period, in services and perhaps high tech manufacturing. If the transition to such industries in the Northeast follows this pattern, then we should find a positive relationship, with the implication that the new jobs are in higher wage industries.

VI. REGRESSION RESULTS

Employment Success

The regression results for employment success in Northeast nonmetro counties between 1950-1970 and 1970-1990 are shown in Tables 4 and 5, respectively. Model I in each table examines only the relationship between the type of economic transition and likelihood of success. From 1950-70, considering only the effects of transition type, the counties that were initially extractive-based were less likely to be successful than those with a diversified base. The least likely to be successful were counties that made no shift from the extractive base. Counties shifting to a service base, or those that remained in manufacturing, were not significantly different than diversified counties. An explanation may be that those counties initially extractive-based in 1950 did not have the factors that would attract the growing industries of this period. As Figure 1 shows, those counties with employment growth below the mean ("unsuccessful") are located in more isolated, and mountainous, parts of the region.

From 1970-90, the counties not shifting from the "traditional" manufacturing base were the least likely to be successful. The manufacturing counties shifting to a service base also were unsuccessful relative to diversified economies. In these counties, the service shift resulted more from a decrease in manufacturing employment, rather than an increase in service employment, thus simply shifting proportions. Counties shifting from manufacturing to a diversified structure, and those starting out and remaining in the diversified and service categories were comparable to the diversified counties in success.

The important point is that when examining only the type of transition, there is evidence that the historical findings for nations as a whole also hold at the county level -- a successful economy is one that makes the transition from the traditional industries to the "modern" ones. Furthermore, the results clearly indicate that a diversified economic structure is important to success. The low psuedo R^2 indicates, however, that there are other factors besides type of transition that explain success.

TABLE 4
Regression Results of Employment Success, 1950 - 1970, Northeast Nonmetro Counties

Variable Name	Model I	Model II
Intercept	0.693 ^a (0.612)	-10.653*** (3.296)
Economic Transition ^b		
Ext (no shift)	-2.773** (1.225)	-0.508 (1.445)
Ext-Mnfg	-1.440** (0.734)	-0.488 (0.874)
Ext-Div	-1.281* (0.728)	-0.451 (0.880)
Ext-Serv	-1.386 (0.935)	0.096 (1.083)
Mnfg (no shift)	-0.423 (0.660)	-0.152 (0.748)
Div-Serv	-0.470 (0.908)	0.630 (1.103)
Other Transitions	0.318 (0.846)	1.114 (0.956)
Adjacency ^c		
Medium		-1.245** (0.640)
Small		-1.153 (0.752)
Nonadjacent		-2.150*** (0.623)
Median Age 1950		0.212*** (0.074)
Median Education 1950		0.538** (0.252)
Change in Female Labor Force Participation 1950-70		0.013* (0.007)
Chi Square	18.99***	53.82***
Pseudo R ²	.097	.240
N	177	177

^aParameter Estimate and Standard Error; Significance Level ***=0.01, **=0.05, *=0.10

^bBase of comparison is Diversified (no shift)

^cBase of comparison is adjacent to large metro area

Model II investigates success in the presence of both the type of transition and the socio-economic factors described above. The inclusion of the other factors results in the transitions not being statistically significant in explaining employment success in 1950-70. The keys to employment success in this period were the measures of markets and labor force -- (1) counties being adjacent to a large metro area; (2) an older population in the younger working age years⁶; (3) a more educated population; and (4) greater female labor force participation.

⁶While the age squared term was not significant, graphical analysis of the data indicated that the positive influence existed only for the younger workforce between the ages of 20 and 38 years. This makes sense during a time of considerable manufacturing growth, when such workers would be in demand.

TABLE 5
Regression Results of Employment Success, 1970-1990, Northeast Nonmetro Counties

Variable Name	Model I	Model II
Intercept	0.619 ^a (0.469)	-14.372*** (4.235)
Economic Transition ^b		
Mnfg (no shift)	-1.684*** (0.595)	-1.858*** (0.683)
Mnfg-Div	-0.924 (0.586)	-1.016 (0.656)
Mnfg-Serv	-1.207** (0.613)	-2.023*** (0.700)
Div-Serv	-0.619 (0.634)	-1.050 (0.729)
Serv (no shift)	-0.860 (0.618)	-1.826** (0.779)
Other	-2.005** (0.919)	-0.996 (1.108)
Adjacency ^c		
Medium		-1.118* (0.587)
Small		-1.390 (0.709)
Nonadjacent		0.033 (0.533)
Median Age 1970		0.012 (0.060)
Median Education 1970		1.358*** (0.309)
Change Female Labor Force Participation 1970-90		0.0210 (0.013)
Chi Square	11.82**	42.56***
Pseudo R ²	.063	.194
N	177	177

^aParameter Estimate and Standard Error; Significance Level ***=0.01, **=0.05, *=0.10

^bBase of comparison is Diversified (no shift)

^cBase of comparison is adjacent to large metro area

In the 1970-90 period, however, the effects of the type of transition remain statistically significant when controlling for other county characteristics. The most consistent result is that counties remaining specialized in manufacturing were less likely to be successful at generating employment growth. Also, there is evidence that shifts to a service specialization did not lead to success. That is, the type of service economy, or the fact that such a specialization may have resulted from simply a decline in other employment, indicate that rural areas may not benefit from the general service growth in the economy.

Adjacency to a large metro area continues to result in greater likelihood of employment success. This is contrary to the suggestion by Tweeten and Brinkman (1976) that large metro areas do not function efficiently as growth centers, but supports the more recent findings of Barkley et al. (1994) and Henry and Drabenstott (1996).

Age and women's labor force participation are no longer significant factors in the 1970-90 period. Whereas a younger work force would be more advantageous when heavier manual-oriented manufacturing industries are prevalent, such labor is less necessary in the modern economy. (And

in this period, much of the region had lost, or was in the process of losing a large proportion of its traditional manufacturing base.) The lack of influence of women's labor force participation is more difficult to explain. The expectation would be that the growth of the service sector in this period would demand more women in the labor force. One explanation may be the fact that in many rural counties the increased dominance of the service sector resulted from declines in other industries, and not from sizeable growth itself. Thus, there would not be an increased demand for labor; the service jobs that women would take were already occupied. Another explanation may be that increasing women's labor force participation had run its course; that the change in the rate of participation was too small to matter. Hayghe (1994) points out this trend. The annual growth rate in women's labor force participation increased through the 1970s, but decreased considerably in the 1980s. Finally, and importantly, education becomes a more statistically significant positive influence on employment success in the 1970-90 period, likely reflecting the changing labor force requirements in the modern high-tech and information-oriented economy.

Income Success

The regression results for income success -- percent change in real median family income -- are shown in Tables 6 and 7. The effects of economic transitions on income success again are apparent, and support the hypothesis suggested by the Fisher/Clark/Kuznets/Singelmann literature. The results from Model I, where only the economic transitions are included, show that the counties that did not shift out of the traditional economic base were the least likely to have income success in both time periods. From 1950-70, counties remaining extractive-specialized were statistically significantly less likely to have had income success. For the 1970-90 period, the same was especially true of manufacturing-specialized counties, but also included all the transition types except diversified. In the 1970-90 period, the income effects of transitions are similar to those for employment success; a diversified economic base was related to greater likelihood of success.

When the other county characteristics are included, slightly different results emerge, but with similar conclusions. The transitions remained significant factors in the 1950-70 period, with the counties making the transition from an extractive to a manufacturing or diversified specialization more likely to have had income success. From 1970-90, however, the transitions were not significant factors in income success when other variables were included. An explanation may be that by the later period the structural shifts out of the relatively low paying extractive industries had been completed, and income differences among industries in rural areas were not significant.

Counties more likely to have had income success in 1950-70 were the most rural (adjacent to small metro areas or nonadjacent), contrary to the results for employment success. An explanation is that these counties were initially extractive-specialized, with lower incomes, so similar income increases will show up as larger percentage increases in these counties. By the 1970-90 period, however, relationships to metro areas appeared to make little difference, certainly for the most rural counties.

Age was a positive influence on income success in 1950-70, as with employment, but again only in the younger working age range of 20-38 years. In the 1970-90 period, however, an older population in that age range was a negative influence, but reversed thereafter, perhaps indicating a positive influence of experience. This may also indicate the effect of in-migrating retirees to higher amenity rural counties. Such retirees tend to have higher incomes than the average of the receiving population.

TABLE 6
Regression Results of Real Median Family Income Success, 1950 - 1970, Northeast Nonmetro Counties

Variable Name	Model I	Model II
Intercept	-284E-17 ^a (0.577)	55.132** (25.270)
Economic Transition ^b		
Ext (no shift)	-2.079* (1.208)	1.809 (3.074)
Ext-Mnfg	0.916 (0.713)	3.685*** (1.076)
Ext-Div	0.288 (0.692)	2.912*** (1.054)
Ext-Serv	-1.253 (0.988)	0.350 (1.379)
Mnfg (no shift)	-0.854 (0.636)	0.026 (0.860)
Div-Serv	-0.223 (0.885)	-0.660 (1.681)
Other	0.406 (0.782)	0.209 (1.061)
Adjacency ^c		
Medium		-0.254 (0.805)
Small		3.001*** (1.032)
Nonadjacent		1.975*** (0.803)
Median Age 1950		0.452*** (0.105)
(Median Age 1950) ²		d
Median Education 1950		-15.195*** (5.436)
(Median Education 1950) ²		0.778*** (0.283)
Change Female Labor Force Participation 1950-70		0.017* (0.010)
Employment Change 1950-70		0.068*** (0.014)
Chi Square	24.440***	110.21***
Pseudo R ²	.121	.384
N	177	177

^a Parameter Estimate and Standard Error; Significance Level ***=0.01, **=0.05, *=0.10

^b Base of comparison is Diversified (no shift)

^c Base of comparison is adjacent to large metro area

^d Inclusion of this variable causes age to be nonsignificant.

TABLE 7
Regression Results of Real Median Family Income Success, 1970 - 1990, Northeast Nonmetro Counties

Variable Name	Model I	Model II
Intercept	1.386** ^a (0.559)	66.078*** (20.470)
Economic Transition ^b		
Mnfg (no shift)	-2.321*** -0.687	-0.687 (1.032)
Mnfg-Div	-1.447** (0.659)	-0.179 (0.998)
Mnfg-Serv	-1.974*** (0.684)	0.069 (1.058)
Div-Serv	-1.019 -0.031	-0.031 (1.052)
Serv (no shift)	-1.145* (0.689)	-0.657 (1.129)
Other	-2.773*** (0.968)	-2.151 (1.871)
Adjacency ^c		
Medium		-1.450* (0.866)
Small		-0.621 (1.001)
Nonadjacent		-0.546 (0.819)
Median Age 1970		-4.097*** (1.298)
(Med Age 1970) ²		0.070*** (0.022)
Median Education 1970		-0.903*** (0.352)
Change Female Labor Force Participation 1970-90		-0.020 (0.018)
Employment Change 1970-90		0.097*** (0.017)
Chi Square	21.714***	121.33***
Pseudo R ²	.109	.407
N	177	177

^a Parameter Estimate and Standard Error; Significance Level ***=0.01, **=0.05, *=0.10

^b Base of comparison is Diversified (no shift)

^c Base of comparison is adjacent to large metro area

Median education was negatively related to the likelihood of income success in both periods, contrary to its effect on employment. In the earlier period, examination of the effects of the squared term shows that the negative effect ends as education rises above 10 years of schooling. An explanation is that the growing manufacturing industries in the earlier period required mainly low skilled workers, who are found in greater concentration in the smaller, more rural counties. This relationship appears to persist in the later period, when low wage service and routine assembly manufacturing dominate these sectors of rural economies. This result illustrates a continuing conundrum in rural areas. The available human resources may attract jobs, but they are not necessarily the jobs that provide the desired incomes.

The impact of female labor force participation rates on income success is similar to that for employment. There is a slight positive influence in the earlier period, but not significant in 1970-90. Explanations may be that either participation rates had reached the level where further increases did not have significant impact, or that while the growing service sector in rural areas may provide more employment opportunities for women, it does not necessarily lead to significant increases in family income. This may be a result of the combination of low wages in this sector and the loss of higher paying jobs in the traditional male-oriented industries, as discussed in Oregon Joint Legislative Committee Report (1984).

Finally, total employment change over the time period is a strongly positive influence on county income success in both time periods. Thus, increasing employment opportunities, regardless of the industries in which they occur, are related to improvements in median family income.

VIII. SUMMARY AND CONCLUSIONS

The historical course of economic development has been a sequential shift of employment from agriculture and other extractive industries to manufacturing, and finally to services (Singelmann 1978). Fisher (1935) believed that these shifts are an inescapable reflection of economic progress, and Clark (1940), Kuznets (1966) and Singelmann (1978) concluded that such shifts are necessary to reach higher levels of income and economic growth. However, in rural areas these changes from the historical economic bases cause continual concern about employment opportunities and the general economic and social welfare. The particular concern is about the ability of rural areas to adjust to the changes and to maintain or increase employment and income. More recent research has focused on the need to maintain a more diverse economic structure. Such diversity has been found to lead to lower unemployment, increases in employment and income, and greater stability.

The purpose of this study was to examine the specific types of economic transitions that occurred in Northeast nonmetro counties from 1950 to 1990, and to determine factors related to the level of "success" in adapting to these transitions. Success was defined as having percent changes in employment or real median family income greater than or equal to the mean for all Northeast nonmetro counties.

The study used Census of Population data to examine economic transitions from 1950 to 1990, focusing on the 1950-1970 and 1970-1990 sub-periods. The major structural transitions found were from extractive (agriculture, mining, forestry) specializations to manufacturing in the 1950-70 period, and then out of manufacturing and into services and diversified specializations after 1970. The results showed that the perception of greatly declining nonmetro employment opportunities and incomes because of this economic restructuring was not true in the Northeast. From 1950 to 1990, only 28 of 177 nonmetro counties had absolute employment declines. The average county employment increase was 75 percent, and the average county real median family income increased by 144 percent.

The results also showed that the type of economic transition influenced success. Interestingly, while shifts out of the traditional economic base were important, the transition associated with the greatest employment and income success was a shift to a diversified economic structure. Although services have been the growth areas of the economy, shifts to service specializations *per se* were not necessarily related to employment or income success. One reason is that a seeming shift to services often was because of declines in other sectors. A second reason, particularly related to income success, is that the types of services prevalent and growing in rural areas are lower paying. From 1950-70, structural transitions associated with less likelihood of success were counties initially

extractive-specialized and counties remaining so. From 1970-90, counties with the least likelihood of success were those remaining in manufacturing, and those initially in manufacturing. Thus, there is some support for the Fisher/Clark/Kuznets/Singlemann hypothesis that economies must shift from traditional industries to be successful. At the same time, the key “transition” associated with success seems to be shifting to a diversified economy.

The transitions themselves, however, were not the sole influences on employment and income success. Metropolitan adjacency plus quantity and quality of the labor force, also were important influences. The position effects of adjacency to large[r] metropolitan areas supports recent findings on spillover affects. A working age population in the 20-38 age range was positively related to employment and income success in the earlier period, when manufacturing was the growth industry, but age was not an influence on employment in the later period when services were the growth industry. In the 1970-90 period, age was a negative influence on income success, but only through the younger working age years, perhaps indicating an effect of more wealthy in-migrating retirees. Education was a positive influence on employment change in both periods, but was negatively related to income changes in both periods. The negative education effects ended after about the tenth grade, however. This may imply that the growing industries in rural areas were seeking lower educated or lower skill workers, whether this was the growing manufacturing in the earlier period or the growing service industries in the later period. The increase in women’s labor force participation rate positively influenced employment and income success, but only in the 1950-70 period. The lack of influence in the 1970-90 period lends support to the contention that the growing rural service sector, which employs largely women, may provide employment, but may not improve family income when traditionally male-oriented jobs are lost in other sectors.

One major conclusion to be drawn from this study is that the lament that losing an agricultural and natural resource employment base, or a traditional manufacturing base, is the “problem” and cause of rural decline is not supported by our results. On the contrary, nonmetro counties that did not shift employment specializations from the “old” to the “new” and growing industrial sectors were the least likely to be successful in increasing employment and income. The results also support the historical findings for nations as a whole, that economies that do not shift to growing industries will fall behind. At the same time, a second major conclusion is that counties with more diversified economic structures were most “successful”. This was true even in earlier decades in the Northeast.

The results of this study also are relevant to rural economic development policy. The results show that rural economies which shift to the growing industrial sectors during a given time period do better in terms of employment and income. Nevertheless, rural economic development efforts commonly focus on maintaining past economic specializations -- recruitment of manufacturing or increasing the profitability of agriculture. However, rather than attempting to resist change in the traditional economic base, or lamenting its occurrence, rural areas should attempt to facilitate change; to determine what the new industries need, and help prepare the local economy and residents for these industries. In particular, rural economic development efforts that attempt to diversify local economies are supported by this study.

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