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Building on Past Experiences: Creating a New Future for Distressed Counties

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Executive Summary

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Appalachia has seen a recent increase in the number of distressed counties within the Region, partly as a result of congressional action that added seven new counties to the Region, with three designated as distressed. Distressed counties are those with poverty and unemployment rates that are 150 percent or more of the national rates and a per capita market income (i.e. per capita income less transfer payments) that is no more than two-thirds of the national average. In FY 1999, 108 counties (27 percent) of the Appalachian Region's 406 counties are designated as distressed. This compares with the national rate of 13 percent (when not counting the Appalachian counties).

In light of these trends, the Appalachian Regional Commission (ARC) requested this study of the development experience of the distressed counties with the aim of identifying the lessons that might be learned from those counties that have changed socioeconomic status. The research consisted of four parts: the first phase examined the origins of the distressed counties program, its purposes, policies and objectives; the second part examined the common factors and trends of 21 counties that had left distressed status since 1988; the third stage analyzed ARC's method of determining and tracking distress and developed an alternative index that could be more completely updated on an annual basis; the final phase of research examined all ARC counties including the distressed counties to determine the major factors that predict persistent distressed status.

Case Studies

Nineteen of the 21 counties that moved out and stayed out of the severely distressed category share common themes. Many enjoyed an early foundation of agriculture based upon private land ownership, infrastructure investments including Interstate and Appalachian highways construction, and investments in educational institutions and medical facilities. These counties are located predominantly in the southern sub-region and have benefitted from manufacturing relocation over the post-war period. The counties tend to be either smaller urbanized areas or are adjacent to metropolitan areas. Almost 15 percent of the income circulating in these counties represents a net inflow of commuter incomes into the local jurisdiction.

An Alternative Distress County Indicator

Next, 399 of the ARC counties were examined based on the traditional distress measures and the differing experiences of distressed and non-distressed counties of the last 20 years. Because of the limits of the existing ARC distressed index, tied as it is to a county-level poverty rate updated only once every ten years, an alternative index is proposed based on unemployment rates, labor force participation rates (percent of population in the labor force), and dependency rates as measured by per capita transfer payments in relation to per-capita income. This alternative measure of economic health is very accurate in portraying and tracking

distressed county progress over time, and has the additional merit that it can be updated on an annual basis.

Factors Predicting Distressed Status

The study then analyzed the determinants of the economic status of all ARC counties for the 1994 period. The statistical analysis sought to predict economic status using 12 socioeconomic variables.

- Percentage of population with four-year college degrees, percentage of income from manufacturing, and percentage of net income from commuting were statistically significant and positively associated with county economic health.
- The percentage of population of single mothers with children under 17, the percentage of females in the labor force, and the percentage of population over 65 years of age have negative relationships with economic health.
- A higher percentage of establishments with fewer than ten employees and higher percentages of county income derived from the government sector have negative associations with economic health.
- Counties adjacent to a metro area were significantly and positively related to better economic health index scores.
- Conversely, residence within the central region had a negative relationship with economic health.

This analysis yields the following findings. Compared with more prosperous counties in the region, distressed counties have a higher dependent population consisting of single female-headed households with dependent children under the age of 17 and the population over 65. We know from national studies that single mothers have a higher incidence of very low incomes and poverty, and in order to work effectively in the wage-earning economy often require access to support programs such as child care services and health care.

Distressed counties lack manufacturing jobs. The association between poor economic health and the share of small establishments with ten or fewer employees also signifies two trends. First, the absence of larger employers may signal that small establishments represent high levels of self-employment. Second and related, given the major role branch plant employment has played in the development of the ARC over the last 30 years, by implication distressed counties have not shared equally in this source of employment growth.

Finally, low levels of women in the labor force signify impediments to female labor force participation. Such limitations include a lack of employment opportunities, social and cultural restrictions, and incompatibilities between the primary and secondary wage earners' work schedules. The geography of distressed counties is distinct and well-known. Distressed counties tend to be very rural, remote from metro areas or the edge of the region, and are not adjacent to metro areas.

Implications. The positive benefits of ARC programs have been muted by the fact that many distressed counties were unable to receive funds under the initial program design because remote, isolated counties did not qualify under the growth center strategy as set forth at the inception of the program. The fact that some distressed counties have left distressed status suggests that positive changes can and do take place. Thus, there is ample room to the take learning that has occurred over the last 30 years to amplify on the distressed counties program.

The development of an alternative economic index to identify, characterize, and track distressed counties allows for much greater precision in sorting out short- and long-term problems. An annual index helps to focus policy concerns on the underlying challenges facing distressed counties and should help better direct the pursuit of solutions tailored more precisely to systemic problems.

The high share of small establishments that are emblematic of distressed counties economic bases could be harnessed through the Commission's entrepreneurship initiative to develop a self-employment learning program. The most challenged entrepreneurs, those with limited incomes and in isolated areas, require considerable support services in addition to the more typical small firm support activities.

Another important difference that separates these poorer communities from those that are more resilient is the absence of social and community capital that is so necessary for developing livelihoods, incomes and quality of life. Social capital such as community leadership, entrepreneurial resources for managerial and technical assistance, access to health care and health education, and student mentoring programs for high school and college-bound students are key examples of an assets-based approach to economic development. The social capital approach complements ARC's leadership and entrepreneurship initiatives and emphasizes building community and individual assets to deepen the development potential of the region, and further capitalize its existing social and financial base.

Given the higher poverty rates among single, female-headed households and lower labor force participation rates, jobs programs also must serve the needs of women. Child care, in-home care for the elderly, and community mentoring are just a few examples of activities that could help support the labor market success for women. Such initiatives should extend beyond welfare-to-work activities.

Finally, the study recommended that the Local Development Districts be given incentives to partner with new players in their communities and obtain the training necessary to partner with foundations so that planning districts can leverage more private funding.

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Acknowledgements

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Building on Past Experience: Creating a New Future for Distressed Counties

Amy K. Glasmeier and Kurtis G. Fuellhart

Introduction

This report presents a detailed examination of Appalachian counties that have been designated as distressed by the Appalachian Regional Commission (ARC). The ARC designation of distressed is applied to counties that meet critical thresholds of high poverty and unemployment rates, and low levels of per-capita market income (personal income minus transfer payments). The Distressed Counties Program created in 1981 as part of the ARC's Finish-up Program has been operational since 1982. One of its main purposes is to authorize funds for a special set-aside to bring water and sewer services to the least advantaged counties in the ARC region. Since 1988, of the 90 counties designated distressed in 1988, 19 have left the distressed counties category.

This report on distressed Appalachian counties is divided into five parts. The first part describes both ARC and broader federal agency attempts to identify areas of highest economic and social need. The second part examines case studies of the 19 of the 21 counties that left and stayed out of distressed status over the 1988–1995 period. In the third part, we present a detailed examination of the entire set of ARC counties based on a descriptive analysis of statistical data from the last 20 years. We contrast the experiences of distressed and non-distressed counties. In the fourth part of the report we examine an alternative measure of economic health that could provide more accuracy in portraying and tracking distressed county progress over time. Because of the limits of the existing ARC distressed index, tied as it is to

the poverty rate, we propose an alternative index based on unemployment and labor force participation rates, levels of dependency in the population (percent of population in the labor force), and per-capita income. Using this index, we are able to identify counties in distress on an annual basis. In doing so here, we explore some of the characteristics of such counties in the hope of providing a clearer explanation of why many have failed to make progress toward economic health. Based on both statistical and case study evidence, the report concludes with a series of suggestions for augmenting the ARC's existing distressed counties policy to better enable counties to graduate from the program.[1]

Part I: The Origins and Evolution of the Distressed Counties Program

We begin this section with a brief overview of the use of special set-asides by federal agencies concerned with the fate and development options of areas of high economic need. We then discuss the history of the ARC program in this area, highlighting both the origins of the ARC Distressed Counties Program as well as the earlier discussions leading up to the Finish-up Program begun in 1981. We conclude this section with a discussion of some of the strengths and limitations of the ARC's distress designation.

1.0 Identification of Counties in Distress

Like the ARC, a number of federal agencies loosely involved in economic development provide special set-asides for rural areas in great need. A survey of other agencies' distressed area definitions requested by the ARC in 1995 suggests that a diverse set of agencies at the federal and state levels make distinctions among locations based on the severity of economic

[1] This study is based on case studies of 32 distressed counties and statistical analysis of data describing the distressed counties group.

circumstances (Fullenbaum and McNeill, 1995). Programs of the U.S. Department of Agriculture (USDA) maintain special set-aside provisions in rural development programs covering housing, electricity, water and sewer, empowerment zones, and enterprise communities. The Economic Development Administration (EDA), under numerous program titles, makes special provisions to fund projects in areas of economic distress. The Housing and Urban Development (HUD) Agency's Community Development Block Grant (CDBG) program contains a special provision for areas with persistent economic problems or distress. Other HUD programs that recognize special local circumstances include the Home Investment Partnership, urban revitalization, and Moving to Opportunity programs. Under its emergency food stamp and shelter program, the Federal Emergency Management Agency (FEMA) provides resources for areas with high levels of need. Finally, other agencies, including the Bureau of Indian Affairs, Tennessee Valley Authority (TVA), and the World Bank, acknowledge the special circumstances of distressed areas.

Within all 13 Appalachian states, economic development programs (either coupled with federal programs or freestanding state-funded programs) make special provisions for areas of economic distress. This practice also is common in states outside the ARC region. A designation of distress is most commonly linked with federal agency mandates such as the Enterprise Zone program.

No single indicator is used exclusively to define distress at the federal or state levels. Some programs use absolute measures such as the incidence of poverty in the population, while others identify distress based on area ranking or score (e.g., income levels or unemployment rates). The ARC survey is by no means totally inclusive, but it does provide a sense for the

variation in indicator usage across a range of programs, and states within and outside the ARC region. Based on their study, most states use absolute indicators of eligibility. Thus, incidence of poverty, population or migration measures, housing conditions, unemployment rates, and a variety of income measures within separate programs are combined to determine eligibility based on economic distress. A smaller sub-set of programs use ranked measures which include unemployment rates, poverty rates, and income levels. Other criteria such as quality of housing or access to education are used by programs providing aid in these areas. Regardless of rank or absolute measure, most measures of distress use some combination of employment, poverty, and income to designate distressed status.

The geographic unit of analysis varies by program area and shows a wide range of geographic eligibility. While counties are the basic unit of analysis, school districts, communities of a specific size (less than 10,000), political subdivisions of various sizes and types, tribal service areas, census tracts, metropolitan areas, states or state subregions, and housing developments qualify for special designation depending on program design and goals. Variation in the unit of analysis obviously makes determination of distress somewhat difficult, given that data on at least some of the indicators used to define local conditions are not readily available or not available in a timely fashion for most geographic aggregates. Perhaps the largest discrepancy plaguing most of these programs is use of the poverty level in the population. Poverty statistics are based on the decennial census. While the U.S. Department of Commerce, Bureau of the Census, provides intercensal estimates of poverty, these are not widely available and have certain geographic restrictions. Thus, one of the most important components of distressed designations, the poverty rate, does not co-vary in time with the

other indicators such as unemployment rate or levels of income. Given the potential susceptibility of places designated distressed to fluctuations in the business cycle, which can have short-term and direct impacts on poverty levels, the lack of timely data presents a serious problem.

The use of a special designation for areas of economic distress dates back several decades. USDA's loan and grant programs and EDA's basic program framework have used special designations for more than 25 years. ARC's program, along with the TVA, was established at approximately the same time in response to similar congressional mandates. Given the specificity of these programs it is interesting to note that none of them have been formally evaluated to determine whether such an action has made any headway in redressing the economic and social circumstances which led to the initiation designation (Fullenbaum and McNeill, 1995).

1.1 The Historical Basis of the Distressed County Designation: ARC and the Finish-up Program

On December 31, 1981, the eve of the new year, the 13 governors of the ARC filed with Congress, *A Report to Congress from the Appalachian Governors*, which "gave birth to the concept of a Distressed County Initiative" (Decker, 1994). At the time of the issuance of the Finish-up Program, the Administration, the Congress, and the public had come to focus on the need for a less costly national government and thus sought to reduce the size and number of domestic development agencies, including the ARC. Like many federal "development agencies" during the 1980s the ARC began to feel pressure to articulate a "finish-up" strategy designed to identify within limits a plan to bring the agency's mission to completion (*Appalachia*, 1984).

Yet, the defining moment for the creation of the distressed county designation cannot be understood outside the pressures the agency felt as it stared down its possible imminent demise. Creation of the designation can be understood as a final effort to secure some level of support for those counties in the 13-state region that had not benefitted from the early days of the program due to their small, rural, and remote conditions (*Appalachia*, 1984, p. 5; Appalachian Regional Commission, 1982). As stated in the 1981 report:

> There has been some criticism of the ARC in the past for failure to provide sufficient help to the most distressed counties in the Region. The Appalachian Regional Development Act, however, established ARC as an economic development agency and requires it to focus its investments where they can be expected to bring about the highest economic development returns. Few of these investment opportunities are found in the most distressed and underdeveloped counties (Appalachian Regional Commission, 1981, p. 39).

As if to stand apart from the agency's original mandate and place responsibility for the care of those areas and communities with problems not susceptible to this mandate with the federal government and the states, the document goes on,

> We believe, however, that in a finish-up program the Appalachian Regional Commission and the Federal government must assume some responsibility to assist these counties prior to the termination of the ARC, to give them some basis for hope in the future. We propose, therefore, that the Appalachian Regional Development Act be amended to authorize $15 million annually for five years to provide special assistance to the 60 or so most distressed and underdeveloped of the 397 (at the time) Appalachian counties (Appalachian Regional Commission, 1991, p. 39).

At the time of its creation, the Distressed Counties Program explicitly cited as an area of greatest need the provision of clean water and adequate sewers. Hence, the program's emphasis has been and continues to be primarily on support for water and sewer systems. The initiative set aside a share of existing funds, but did not step outside of the broad institutional mandates that had come to characterize the program after 1975.

Emphasis on water and sewer provision made sense in the program's early years. As the ARC noted in its spring 1984 issue of *Appalachia*, the agency's recurring magazine, "Previously, due to limited economic growth potential, these counties had been unable to qualify for most ARC or other kinds of development funding." Thus, basic infrastructure remained a critical and unaddressed need of these communities. A broader mandate, though discussed among the ARC staff, was difficult to justify given the very basic needs of the poorest parts of the region.

With the acceptance of the 1981 report, the Finish-up Program planned around a five-year cycle gave the Commission time, but more importantly it established the cycle of program development for a series of new initiatives, one of which was to provide special assistance to areas deemed of greatest need. The set-aside's mandate coincided with a drastic decline in overall program funds. Any hope of coupling substantial development funding with water and sewer funding was never realized. Funds were reduced from a high of approximately $135 million in 1976 for Area Development activities to $55 million in 1994. To gauge the significance of this decline, in the early 1970s, prior to the removal of categorical investment requirements in such realms as education and training, health and child development alone received $70 million per year, a large sum even by today's standards. An annual set-aside assured that a share of the agency's funds (approximately 20%of the Area Development funds regardless of the number of counties qualifying) would be targeted towards counties experiencing unusual economic hardship.

Unfortunately, implementation of the program did not emphasize the complex and multi-faceted needs of residents of counties with the most severe problems, nor were the

program targets able to counter or reduce the deeper underlying problems facing these areas. Distressed program funds have largely emphasized the provision of basic infrastructure. Relatively little of the set-aside resources have been targeted to the social needs of these communities. Nor were these funds of the type or magnitude to confront the deeper underlying problems that precipitated distressed counties' social needs, including the high level of absentee land ownership and therefore lack of local assets, the severe environmental degradation that accompanied countless years of strip mining and poor timber practices which contributed to health problems, and an elite power structure that restricted residents' abilities to seek out and demand access to institutions of community development and social change (Gaventa, 1980; Whisnant, 1994). To this day, the original program emphasis provides the backbone of assistance that aids the most economically disadvantaged counties in the region.

1.1.1 Justification for the Distressed Program. On the eve of the birth of the Distressed Counties Program, the ARC identified 900,000 Appalachians living in some 67 counties who had not appreciably benefitted from the overall program. More than three-fourths of those residents lived in 1,800 communities and "small settlements of 25 or more homes." These communities and literal clusters of homes ranged in size from between 25 to 50 families, to counties with a total population of 5,000–7,000 residents (Appalachian Regional Commission, 1981). Too small to benefit from the ARC's original economic development principle of "concentrated public investments made in the region in areas where there is the greatest potential for future growth, and where the expected return on public dollars would be the greatest" (Hansen, 1972, p. 268), and perhaps too isolated and too insular to request more from the public sector (Gaventa, 1980; Whisnant, 1994), these deeply distant, rural places

remained unaffected by the ARC's emphasis on concentrated investment, uniform infrastructure planning, and roads. The growth-center investment policies that characterized the early history of the program were designed to move people out of places of little potential to those having more. As Jim Pickford, ARC staff member, noted in testimony before the Commission in 1981, "We are basically dealing with those counties we bypassed in terms of projects that were funded" (Appalachian Regional Commission, 1982, p. 56).[2]

These enduring problems did not go unnoticed by ARC Washington staff. Indeed, over the course of the 1970s, internal documents attest to the recognition of very serious differences in social and economic conditions found in various parts of the region. Jerome Pickard, Geographer and Demographer at the ARC, experimented in the early 1970s with the development of indexes of distress, focusing on a variety of characteristics selected to capture differences within the region. He developed four indices: socioeconomic, labor force capacity, housing quality, and a composite of these three. His findings cast early light on the deep problems of the core distressed areas of the region (Pickard, 1974; see Table 3 for a rank order listing of counties based on Pickard's 1960s composite index). Although Pickard's findings were items of discussion within the Commission, another eleven years would pass before his seminal insights informed deliberations leading up to the creation of the Finish-up Program.

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[2] Further complicating, and in some sense diminishing, the significance of even the initial set-aside, the original computation of the distressed county measure was most noticeably affected by changes in the unemployment rate. Hence, through time, additions to the original 67 counties occurred as business cycle downturns and structural change led to increased unemployment over the subsequent two decades.

Thus, although precipitated by changes in national emphasis in the realm of welfare and poverty policies, the origins of the Distressed Counties Program date back much earlier in ARC history. The selection of identifying criteria for counties in distress was based on ongoing discussions of the region's problems inside the Commission. Similar concerns were present in debates occurring within and among federal and increasingly international agencies attempting to pare down the focus of development programs. The intent of the distressed measure was to develop an analytical method by which improvements in the conditions of counties could be tracked through time. While the specific measures used through time have changed and vary to some extent across different policy contexts, nonetheless, the overarching goal has been to establish a baseline that could be used to assess improvements (or declines) in local conditions.

Being created in the early 1980s, in an era in which federal deficits drastically reduced support for the ARC, the Commission's Distressed Counties Program was not originally empowered with the tools and resources to make major inroads towards resolving some of its communities' most pressing problems. Indeed, for these isolated communities, the full complement of ARC programs that emphasized people- and place-based mandates was desperately needed. The problems identified in the original ARC report still held—child, human development, and community development; unfortunately, the small amount of annual funds set aside for the most distressed areas was simply not enough to have a major impact on the most serious concerns confronting these communities. The comprehensive development support received by the larger and more urban counties in the region over the late 1980s and early 1990s was never made available to the most distressed locations. Although basic infrastructure has been provided in numerous places, nonetheless, by the end of the 1990s,

conditions found in many of these and the remaining distressed parts of the region differ little from those that described them in 1981.

1.2 Implementation of the ARC's Distressed Designation

The original ARC distressed designation was based on four measures: income, unemployment, poverty, and infant mortality rates. These measures were selected from a larger list of 12 indicators. Used until 1988, the set was pared down by one with the elimination of the infant mortality rate. This action was taken as the region's mortality rate converged with the national average.[3]

1.3 Benefits from Receipt of the Distressed Designation

Distress benefits represent adjustments made in existing program criteria for project funding. Those states with the distressed designation can receive 80 percent rather than the usual 50 percent in matching funds for projects from the ARC. This more generous match applies to all ARC funds and not just the distressed county set-aside. States also can and regularly do use their general Area Development allocations in conjunction with distressed status.

The level of funding available under the distressed county set-aside is determined annually. The formula for distribution includes "the area and number of qualifying counties in each state, their population; and the proportionate number of houses without plumbing in the

[3] Removal of the infant mortality indicator greatly improved the underlying relationship between the concept of distress and the ARC's designation. Mortality statistics are notoriously problematic, particularly in rural counties where small numbers and a high degree of inter-temporal variation make these statistics unreliable as predictors of underlying socioeconomic conditions. Normally, distressed county funds cannot be used for a smaller unit of analysis.

distressed counties for each state" (Decker, 1994, p. 2). Each factor is weighted equally in the formula. The distribution formula is voted on annually by all Commission members.

1.3.1 Eligible Counties. The number of counties designated distressed and the amount of annual funding for the set-aside have varied through time. Of the original 397 counties, 67 were given the original designation. Although the original cutoff procedure was loosely based upon a distribution of all counties into four groups of equal frequency (quartiles), the existing cutoff procedure set thresholds for the distress criteria and then the number of counties in each category was free to change with economic conditions.

Although the governors initially sought approximately $15 million annually for the program, the funding level has varied through time and makes up approximately 20 percent of the total funds available for Area Development. Given that the ARC budget has fluctuated over the life of the special designation, approximately $236 million have been spent in those counties exhibiting high levels of economic hardship. The vast bulk of these funds have been spent on water projects (85%; ARC, 1998). Since the set-aside was established, a number of modifications have been made in the original formulation. In 1994, 115 counties qualified. In 1998, 106 counties were designated as distressed. The enlarged list of counties was due to an increase in the flexibility of qualifying criteria, whereby a county that met two of three criteria could be eligible for special designation, provided it had at least twice the national poverty rate. This adjustment was made when it became evident that counties with high levels of discouraged workers experienced lower unemployment rates.

The poverty rate looms large as a major weight in the determination decision, although it is collected only once every ten years as part of the decennial census. The lack of timely data

on poverty is a double-edged sword. On the one hand, counties that should have cycled out of the designated distressed category status may have retained access to more generous funding levels simply because of the lag in the poverty variable. On the other hand, counties that experienced significant economic decline on an intercensal basis might have had difficulty securing funds in a timely fashion given the original criteria.

An ARC analysis to determine the extent of the distressed designation compared ARC distressed counties with all counties nationally. The measure proved to be quite conservative when applied to the nation as a whole. Only 525 of a total 3,140 counties would qualify under the ARC designation. Comparable counties included those in the Mississippi Delta, the Rio Grande border counties of Texas, the Mesabi range in Minnesota, as well as scattered areas associated with American Indian reservations. The majority of these so-called distressed counties are nonmetropolitan, with slower population and income growth rates than are found for the rest of the country. About one-quarter of the counties were highly dependent on manufacturing, while another and much smaller number were either dependent on mining or dominated by federal land ownership. Recent research by Mark Nord of the Economic Research Service, U.S. Department of Agriculture, re-examined the larger question of nationwide county distress and found a general decline in the number of counties in high-level distress over the 1960–1980 period (Nord, 1998). Based on adjusted income (income minus transfer payments), our results, emphasizing the 1980s and 1990s, indicate that conditions in ARC distressed counties diverged strongly from national trends. Income levels in distressed counties declined over the 1980–1995 period. Nord's later work confirmed our findings.

1.4 Summary

In summary, the use of special designations to identify areas of greatest need and the selection of criteria to capture differences across locations is a common, longstanding practice of development agencies. ARC's Distressed Counties Program can be seen as part of a larger movement in economic development to identify and track conditions in areas with persistent problems with the intent of providing special assistance. Over the last 18 years, the number of counties designated distressed has changed in response to national as well as local economic conditions.

Before turning to a region wide assessment of the distressed counties, a review of a sample of the 21 counties that have left the designation since 1988 is in order. From this set of successful experiences come insights that can inform a more comprehensive future Distressed Counties Program.

Part II: Case Studies of Formerly Distressed Counties

2.0 Introduction

We begin the analytical portion of this report by examining cases of success among formerly distressed counties. The designation of distress was designed to situate the more economically challenged counties within the context of larger national trends. In so doing we are able to examine through time the conditions of counties that share common characteristics. A second level of analysis can identify which, if any, counties left the distressed county group and to the extent possible help identify underlying factors that lay behind their improvement. Admittedly, this type of analysis can tell us something about changing conditions in a small subset of counties at a single point in time, but it cannot explain earlier changes that might

have occurred nor can it tell us about those that did not change. Nonetheless, by examining those counties which did leave the designation, we are able to determine the degree of similarity in the group's experience, and identify some of the unique attributes of these locations.

In the spring of 1997 and the spring of 1998, case studies were conducted for 14 of the 21 counties that had left the severely distressed category between 1988 and 1995.[4] Both statistical analysis and field research were completed for these counties. Professionals contacted in the field included local economic development practitioners, local political officials, and medical health, education, and community development professionals. In addition, we contacted LDD staff in local offices. The initial statistical analysis was quite general and covered the period 1970–1990.

We present highly condensed summaries of the 14 counties' experiences in Table 1. We separate those counties that have continued to remain undistressed from the two cases which returned to the distressed category over the 1995–1998 period. The 14 case studies were supplemented with more detailed statistical analysis of a set of variables that looked further back in time in an attempt to capture longer-term trends. This secondary analysis considered all 21 counties.

In addition to the case studies of successful transition counties, in the spring of 1998 we undertook a series of studies of distressed counties with a particular emphasis on children's

[4] Two counties, Doddridge and Pike, fell back to distressed status between 1996 and 1998; nonetheless, these two counties' experiences are reported here.

Table 1. Case Studies for 14 Counties

Bibb County, Alabama

In 1960, *Bibb County, Alabama,* was a poor, isolated, largely agricultural county with a poverty rate (43.2%) significantly above national averages and a per-capita income level half the national average. By 1994, the county's unemployment rate was 7.6 percent, still above the national average but converging on regional and national norms. Per-capita market income was 80 percent of the state average and climbing. The county has benefitted from highway construction and Alabama's industrial training programs, which have made the county's labor pool attractive to employers relocating to the region. Today, the location of a new Mercedes Benz manufacturing plant in the adjacent county is expected to add to the already significant amount of net local income from commuters traveling to job destinations outside the county (27%). Given growth in manufacturing both within and outside the county, Bibb is expected to add to the region's good economic fortunes.

Chickasaw County, Mississippi

Chickasaw County, Mississippi, has benefitted handsomely from the filtering of manufacturing employment from nearby Tupelo, a major manufacturing center in the northwest corner of the state. The county enjoys a high-quality transportation infrastructure, including an interstate, two state highways, and an historic parkway. Historically dependent on agriculture, Depression-era programs reduced the available crop land, thereby driving up land prices and stabilizing the agriculture sector. The county was an early site for southern industrial plants; textiles, furniture, and plastics firms offered jobs to county residents. Today, the county boasts 18 percent of the state's jobs in furniture manufacturing. These jobs account for 70 percent of the county's total manufacturing employment. People commute into Chickasaw for jobs in manufacturing; thus, it is one of the 21 counties that exports more income than it imports through commuter income. Income levels in 1990 were reaching state averages.

Cumberland County, Tennessee

Cumberland County, Tennessee, halfway between Nashville and Knoxville, sits atop fertile agricultural land of the Cumberland Plateau. Bisected by Interstate 40, Cumberland County has experienced a dramatic change in economic circumstances over the last 35 years. In 1960, like many Appalachian counties remote from metropolitan areas, more than 36 percent of Cumberland's population lived in poverty and many had an average per-capita income level less than half the national average. This forested county, blessed with rolling hills and abundant lakes, ponds, and streams, has turned its natural beauty into an asset. In the 1960s, mining and agriculture were mainstays of the local economy, along with timber and furniture manufacturing. In the intervening 38 years, the county's economy has been transformed into a destination for tourism and retirement-related activities. Within 50 minutes of Tennessee's major population centers, Cumberland attracts old and young alike. This growth has brought with it a rise in the per-capita income level, which is converging toward the state average, and poverty rates only two percentage points above the state average (18 vs. 16). The unemployment rate is converging on the state average.

Table 1. Case Studies for 14 Counties (cont.)

Marion, Tennessee

Marion, Tennessee, which is proximate to Chattanooga, began as a strong agricultural region with flat fertile land. The county experienced population growth throughout the post-war era, is served by several highways and an interstate, and has railroad access. The county has been a manufacturing center since the turn of the century, and has substantial infrastructure, including a technical community college. Net income due to commuting has increased over time.

Montgomery, Kentucky

Montgomery, Kentucky, which is proximate to Lexington, began as a strong agricultural region with flat land, has experienced population growth throughout the post-war period, and is serviced by several highways and an interstate as well as having railroad access. The county has embraced manufacturing jobs since the 1950s. Most of the housing stock in the 1950s was of sound construction. Net income from commuting has increased through time.

Monroe County, Tennessee

Monroe County, Tennessee, is located halfway between Knoxville and Chattanooga, on the southeast border of the state. The county is served by an interstate and several major state highways. Agriculture and manufacturing were equally important in the 1950s. As agriculture declined in the 1950s, manufacturing continued to grow. Commuting-related income has been a major component of local income since at least the 1970s.

Pendelton County, West Virginia

Pendelton County, West Virginia, has emerged from years of economic stagnation to become a region of West Virginia where poverty, unemployment rates, and income levels are converging on state averages. The experience of county residents is quite different today than in 1960, when almost half of the population lived in poverty and per-capita income was less than half the national average. Today, thanks to a growing tourist economy, modest increases in manufacturing employment, and an expanding service sector, unemployment rates are as low as 4.6 percent. Per-capita income figures are surprisingly robust ($16,839), equaling 92 percent of the state average. The county's educational attainment levels continue to climb, with student test scores above the national average. Most remarkable, poverty rates have fallen to 17 percent, almost three percentage points below the state average.

Table 1. Case Studies for 14 Counties (cont.)

Pickett County, Tennessee

Pickett County, Tennessee, demonstrates a slow but steady progression toward a bright economic future. In 1960, the county's poverty rate was 32 percent and average per-capita income was one-third the national level. Pickett, like its neighbors, Overton, Clay, and Fentress, all experienced substantial improvements over that time. Blessed with rich Cumberland Plateau soil and flat ground, agriculture was profitable and small settlements were possible. A combination of tourism-related, education, and transportation infrastructure investments, blended with a small population, have helped Pickett County develop a stable economy with a strong future. With its own manufacturing job growth and proximity to adjacent counties enjoying increased numbers of manufacturing and service jobs, many of Pickett's residents commute to employment opportunities. This commuting pays off; the county receives a net 18 percent of income from wages earned outside the area.

Polk County, Tennessee

Polk County, Tennessee, close to Chattanooga, is blessed with a large timber forest and beautiful rivers, has benefitted from TVA's dam developments, is serviced by several state and four-lane highways, and has railroad access. Manufacturing employment has been present since the 1950s and the county has gained jobs in the tourist industry. Net commuter income has doubled since the 1970s.

Preston County, West Virginia

Preston County, West Virginia, historically has enjoyed a coal-based economy. The county is mountainous with lush forests. Morgantown, a major university town, is close by (25 miles). The county is served by an interstate and a state highway, and has rail service in the southern portion. Preston County has been able to take advantage of its natural environment in attracting tourists. The county boasts two state forests, one national forest, a ski resort, white-water rafting, and other outdoor activities.

Pulaski County, Kentucky

Pulaski County, Kentucky, has both mountainous and flat topography. The county has benefitted from TVA dam projects and is served by a railroad and several state and federal highways. It has long embraced agricultural production, and moved into manufacturing at the turn of the century. Land has and continues to be privately held. Population growth over the post-war period has been strong. The county has a regional medical center.

Table 1. Case Studies for 14 Counties (cont.)

Randolph County, Alabama

Randolph County, Alabama, was well-positioned to benefit from post-war growth in the southern United States. Like Bibb, in the 1950s, Randolph County was primarily agricultural and relatively poor. The poverty rate was 49.3 percent and income was half the national average. Over the subsequent 35 years, economic development transformed the county's economic base into a services, tourist, and manufacturing center. In 1980, the county's poverty rate was 23 percent. A decade later, this rate had dropped substantially to barely above the state average (18% vs. 17%). The county's per-capita income level is within 80 percent of the state average. Net commuter income contributes 20 percent to the county's total income. Investments in tourism infrastructure and worker training have made Randolph an attractive destination location for vacationers and manufacturers alike.

Pike County, Kentucky

Pike County, Kentucky, is well known for its severe problems and the remarkable and heroic gestures made by the ARC (cutting down a mountain, re-routing a river, and re-routing railroad access), and the federal government more broadly, to redefine the economic options facing the county. Despite very large sums of money spent to bring jobs and provide access to the county, Pike remains distressed: its poverty rate has been as high as 25 percent and its unemployment rate, 10 percent—more than five percentage points above the national level.

Doddridge County, West Virginia

Doddridge County, West Virginia, fares little better, with an average per-capita income of less than $8,700 in 1990, a poverty rate of 23 percent, and an unemployment rate of almost 10 percent. Traditional resource jobs are being replaced with marginal service, textile, and government jobs. Many residents commute out of the county; 33 percent of net income is derived from such workers.

health. The results of this project suggest that many important challenges facing young children in the region relate to fundamental problems of insufficient quality schools, lack of access to health care, and the lack of stable economies in which to grown up and be a part. While we do not detail these case studies, we do return to issues of children's health and education in distressed counties in the conclusions to this report.

2.1 The Fortunate "21" Counties that Left the Distressed Category Between 1988 and 1995

Common among the case study counties that successfully transitioned from extreme distress was an early foundation of agriculture based upon private land ownership, infrastructure investments (including interstate and Appalachian highways construction), and investments in educational institutions and medical facilities. A brief examination of 21 counties suggests both impressionistically and factually that these counties shared a similar potential which helps explain their emergence from the distressed county group.

A picture of the fortunate 21 counties tells a story of a relatively homogeneous group of locations, many of which as early as the 1950s were destined to make major strides toward economic health. Table 2 presents a series of statistics about these counties. An obvious characteristic linking the 21 counties is their geographic location. More than half are located in the southern subregion of Appalachia. Set apart from the rest of Appalachia, this fortuitous location has been the beneficiary of the general decentralization of manufacturing over the post-war period. While the public sector in many of the ARC counties was an active recruiter of branch plants, nonetheless, manufacturing decentralization has unfolded as part of a larger process of reorganization of the national economy, and thus is the result of forces originating

Table 2. Statistics for 21 Counties

County Name	State	Population Change 1930–1990	ARC Sub-Region	ARC Distress 1988	ARC Distress 1998	Beale Code[a]	Per-Capita Market Income 1993	Poverty Rate 1990	Average Unemployment Rate 1993–1995	Income Earned Outside County %	Mean Travel Time to Work
Talladega	AL	0.69619267	South	1	2	4	$10,354	0.202	0.081	9.98	20.8
Randolph	AL	-0.2434012	South	1	2	7	10,775	0.189	0.082	16.65	23.0
Lawrence	AL	0.21754139	South	1	2	3	11,400	0.198	0.086	24.34	25.4
Fayette	AL	-0.0229898	South	3	3	6	11,023	0.203	0.073	10.27	20.3
Clay	AL	-0.2373368	South	1	3	9	11,829	0.174	0.075	12.38	22.3
Cherokee	AL	0.04050645	South	1	3	6	10,710	0.176	0.064	25.94	24.7
Bibb	AL	-0.1365736	South	1	2	6	10,150	0.212	0.088	27.17	26.8
Preston	WV	0.02768309	North	1	2	7	9,374	0.189	0.099	19.86	25.3
Doddridge	WV	-0.2935736	North	1	1	9	8,691	0.230	0.093	33.04	27.5
Polk	TN	-0.0907178	South	1	3	9	10,681	0.183	0.074	27.06	27.3
Pickett	TN	-0.1837934	Central	1	2	9	10,477	0.249	0.081	19.52	20.6
Overton	TN	0.01272194	Central	1	2	7	9,048	0.179	0.080	19.5	20.8
Monroe	TN	0.53749357	South	1	2	6	9,937	0.178	0.091	10.17	24.1
Marion	TN	0.50829107	South	1	3	2	10,863	0.193	0.066	28.33	28.7

Table 2. Statistics for 21 Counties
(cont.)

County Name	State	Population Change 1930–1990	ARC Sub-Region	ARC Distress 1988	ARC Distress 1998	Beale Code[a]	Per-Capita Market Income 1993	Poverty Rate 1990	Average Unemployment Rate 1993–1995	Income Earned Outside County %	Mean Travel Time to Work
Cumberland	TN	2.5354021	Central	1	3	7	10,253	0.181	0.075	4.46	20.7
Tippah	MS	0.10671026	South	1	3	7	9,727	0.226	0.060	5.77	22.0
Chickasaw	MS	-0.1190305	South	1	2	7	10,270	0.213	0.090	-1.98	19.3
Russell	KY	0.32908634	Central	1	2	9	9,145	0.256	0.091	-5.32	17.8
Pulaski	KY	0.53114478	Central	1	3	7	10,544	0.227	0.065	-1.65	19.1
Pike	KY	0.16506235	Central	1	1	7	10,339	0.254	0.102	-3.26	25.6
Montgomery	KY	0.7651801	Central	1	2	6	10,670	0.210	0.086	12.47	20.7
Mean		0.24502807					$10,298	0.2058	0.08101	14.03	22.99047619
s.d.		0.61404136						0.02607416	0.011589202	0.11497856	3.148952963

[a]Beale code descriptions can be found in Appendix A.

outside the region. A second, important characteristic binding these counties together is population growth based in part on interregional migration, which occurred over the post-war period. While some of the counties grew only minimally or not at all, only eight posted negative growth. Thus the majority experienced a positive change in population growth over the 1930–1995 period. Some posted rather remarkable rates of growth as illustrated by the standard deviation in population growth of the group, which was 61 percent—three times the average growth rate of 24 percent. To the extent emigration occurred, counties losing population may have actually benefitted from this decline in as much as it served to tighten labor markets and decrease unemployment rates through time.

These counties share other characteristics as well. More than one-third are either metropolitan (metro), have an urbanized area of at least 20,000, or are adjacent to metro areas. The benefit of this status is clearly seen in the amount of net income derived from employees who commute outside their county of residence for jobs. On average, almost 15 percent of the income circulating in these counties comes from outside the local jurisdiction (REIS Journey to Work Data 1970–1995). Residents are geographically proximate enough to other labor markets to find employment. For some counties the importance of this income source is significant. More than one-quarter of the counties' residents earn as much as 25 percent of their net income from outside their county of residence. Commuting times support these findings.

The group is surprisingly homogeneous on other measures. The average rate of poverty is 20 percent, several percentage points below the distressed group average, and the standard deviation is only 2 percentage points, suggesting considerable similarity within the group. Affinity within the group also is demonstrated when examining average per-capita income. The

average income level is $10,300, and the standard deviation is less than $800. Like the two previous measures, counties exhibit very similar unemployment rates of 8 percent with a standard deviation of one percentage point. The similarity in the group and the close levels of prosperity are more than coincidental. In many respects, given their geography and their previous economic history, the entire group of 21 exhibited surprisingly similar development trajectories.

Other comparable characteristics can be found as well. Many of the counties, particularly those located on the Cumberland Plateau and within the TVA watershed, experienced significant public-sector investment in water impoundment infrastructure. In addition to flood control, these investments proved to be important tourist attractions (Pickett County, for example). Also among the counties that left the distressed categories are areas of significant scenic beauty, which served to support tourist development (Pendelton, WV). Even other counties such as Montgomery County, KY, have taken advantage of changing demographics and built housing developments and infrastructure to attract retirees to the area. Thus, in addition to the more conventional sources of economic development such as manufacturing, these counties are fortunate to have nice environments to sell.

These counties are important examples of community and economic development success. For all of them, the 1980s and 1990s have been very good years. While there are still realms in which they lag behind both state and national averages, nonetheless their emergence from periods of economic stagnation appears irrefutable. These counties are increasingly focusing on filling in those areas that complement the infrastructure and institutional investments that they received over the last 30 years.

Public policy, both state and national, has been important in assisting these counties to achieve a status close to national averages on many indicators of economic health. Most have benefitted from the development of the interstate and Appalachian highway systems, the shift of manufacturing southward over the post-war period, the existence of state economic development and training programs, the construction of educational facilities, the growth of tourism and destination developments for retired persons, and the provision of additional infrastructure in the form of water and sewers. In all, the rise of these counties to near equal status with national norms is a testament to successful national economic development policy and plans.

The story of the lucky 21 must be tempered, however, with the knowledge that two counties fell back into distress. In important ways, Doddridge and Pike Counties represent the status quo experience of distressed counties in Appalachia. Isolation, low levels of education, a retreat of natural resource-based industries, and a lack of social infrastructure reflect basic problems facing the distressed county group as a whole. As this report is being written, Chickasaw County, like Doddridge and Pike, is in danger of falling back to severely distressed status because several manufacturing firms have closed down or laid off workers. This experience signals the fragile nature of economic success found in many Appalachian counties. The recent crisis in Asia has only added to the problems of these counties. Job losses reported in once booming areas of the South such as Charlotte, NC, must be considered harbingers of what is yet to come to the ARC region (*New York Times*, November 10, 1998).

Part III: The Distressed Counties Based on the ARC's Index

The case studies just presented provide interesting though limited insights into why some counties have transitioned out of the most severely distressed county category while others have remained distressed. These results, however, provide only a glimpse into the experience of less than 10 percent of the total counties, thus making generalizations hazardous. The current system of designation has serious limitations and makes timely tracking of changes in distressed county status difficult. A key limitation of the existing system is the use of the poverty level as a primary indicator. As mentioned previously, the poverty rate, being collected only once every ten years, tends to dampen or arbitrarily overstate circumstances depending on the conditions in a county once every ten years during a census-taking year. Recognizing the problems of single indicators, previous analysis conducted by ARC staff demographer Jerome Pickard attempted to overcome this problem by developing a combined index that captured the complex conditions found in the region in the 1960s. Building on this past experience, in the next section, we first examine the ARC's current index to determine the broad outlines of distressed county geography and behavior. This is followed by an alternative index developed by us that permits the tracking of distress on an annual basis.

3.0 A Retrospective View of the ARC's Distressed Counties

Having described the program, and its history and composition, we now present an analysis of the characteristics of the ARC distressed counties over the 1992–1998 and 1980–1995 periods. Our intention in the rest of this report is to explore differences between counties that have remained distressed throughout the period and those that have moved toward national averages. Our analysis sought to determine differences between distressed counties and

the rest of the region's counties, and to explore the relative conditions of counties through time. The research was designed to identify underlying qualities/characteristics of persistently distressed counties with the goal of suggesting program areas that could assist in the future development of these counties.

We began our analysis of distressed counties through an examination of the ARC's own designation of distressed. This is followed by a discussion of an alternative index developed to overcome some of the temporal and analytical limitations of the ARC's index. We developed a surrogate measure of distress that would mimic the ARC definition, but which would not be constrained by a number of technical problems built into the ARC designation. We subsequently compared our index results with those of a comparable study of counties based on the ARC designation. The degree of overall correlation (.8) between the two methods of analysis was significant. This means the two measures are assessing the same underlying conditions. Thus, our index accomplishes two goals: it presents results which are consistent with ARC policy interests while allowing more detailed year-to-year examination of county conditions.

3.0.1 Examining the ARC Designation. We turn first to a discussion of the existing system of distress designation. The ARC uses a five-category scale to describe the economic status of counties under its auspices. This scale, in which 1 describes the "worst" case and 5 describes the "best" case, is based upon three underlying criteria: poverty level, unemployment rates, and market income. Rankings are applied to member counties based upon (1) their relative level on each of these distress measures in comparison with U.S. averages; and

(2) how many of the three measures are below threshold values in comparison with national averages. Table 3 summarizes the criteria for designation along the 5-point scale.

Under this rating scheme, for analytical purposes, counties with a distress scale rating of 1 or 2 are considered distressed, while those attaining ratings > 2 are considered non-distressed. Category 1 distressed counties are the only group eligible to receive special set-aside funds. A summary of the number of counties in each of the five distress categories over the period 1992–1998 can be seen in Figure 1 (Distress Ratings by Year, 1992–1998). A comparison of distressed (rating $<= 2$) versus non-distressed counties (rating $>= 2$) is provided in Figure 2 (Distress Status by Year, 1992–1998). As these figures show, the distribution of counties in the various distress categories has been relatively constant over time, though a slight overall improvement is detectible in recent years. This may be related to the robust nature of the U.S. economy as a whole.

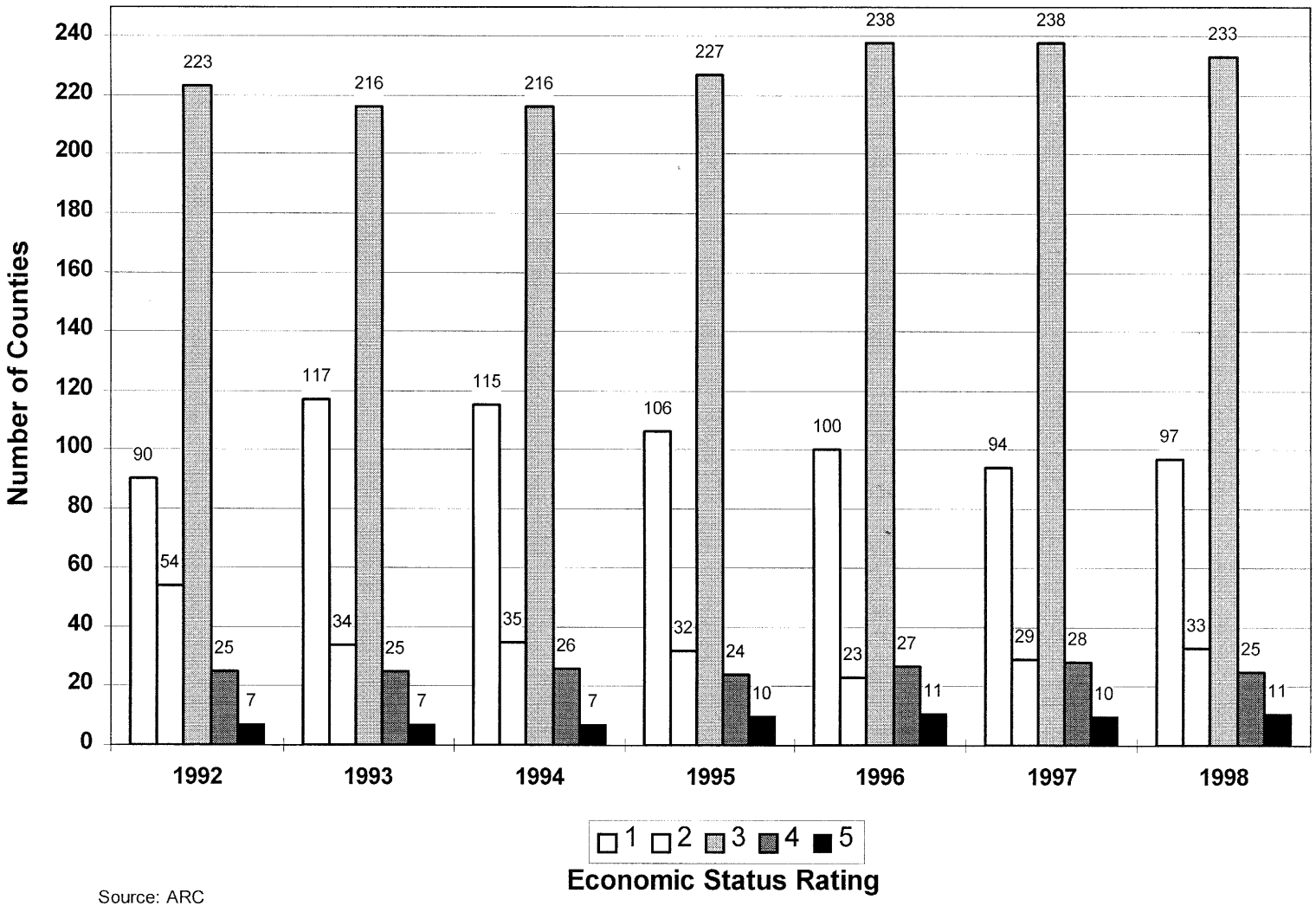
In recent years, the ARC has combined categories 2 and 3 into one category. In our analysis, for reasons of historical comparability, we initially retained the 5-point designation. With this gesture, our results serve to retain the meaning of the ARC's original designation system. As the discussion in the subsequent analysis demonstrates, the key distinction in the designation of distressed is found in those counties that score less than 3 and those which score 3 and higher. Thus, our results remain true to the original principle behind the categorization, while providing greater clarity about the central core distressed counties as well as those counties that have gone in and out of distress through time.

Table 3. ARC Distressed County Designation Criteria

Designation	Unemployment: 3-year avg.		Market Income: Per capita		Poverty Rate: 1990 Census		
1. Severely Distressed	>= 150% of U.S.	&	<= 67% of U.S.	&	>= 150% of U.S.	Or	2x U.S. poverty plus one other indicator
2. Distressed	>= 125% of U.S.	&	<= 67% of U.S.	&	>= 125% of U.S.	&	Not severely distressed
3. Middle	All other counties						
4. Strong	<= 100% of U.S.	&	>= 80% of U.S.	&	<= 100% of U.S.	&	Not very strong
5. Very Strong	<= 75% of U.S.	&	>= 80% of U.S.	&	<= 75% of U.S.		

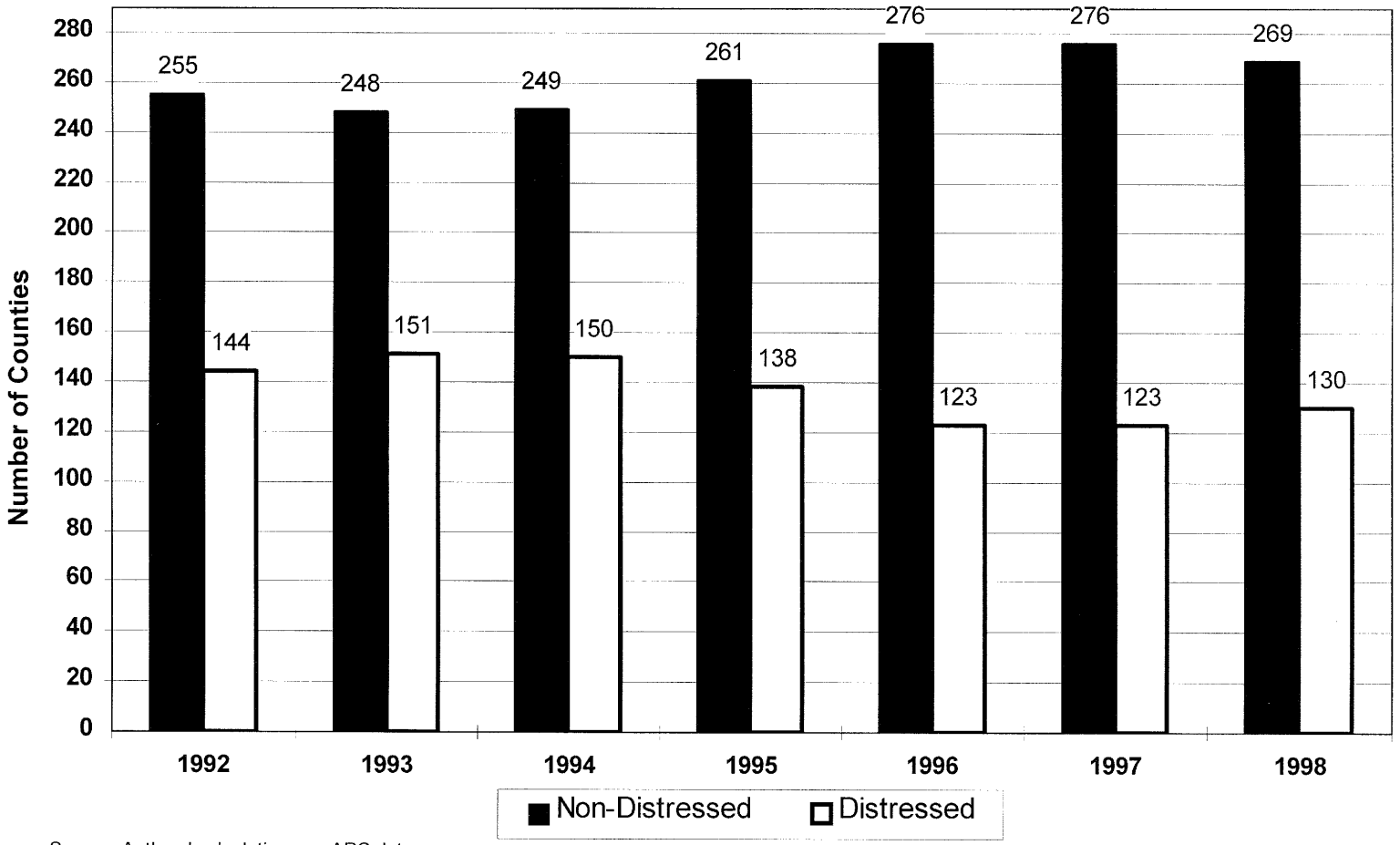
Source: ARC documents

Figure 1. Economic Status Ratings by Year, 1992–1998



Source: ARC

Figure 2. Distress/Non-Distress Status by Year, 1992–1998



Source: Authors' calculations on ARC data

3.0.2 A First Cut at the ARC Five-category Ranking. Our first effort was designed to examine in detail both numerically and spatially the distribution of distressed counties using the ARC definition. This required us to confront the problem that the allocation of counties was not based on a summary measure derived from continuous or interval data, but rather was determined by counties meeting certain thresholds. By implication, ARC's procedure converted data with considerable variation (actual income levels and unemployment and decennial poverty rates) into data with much less variation, with each county no longer analytically distinguishable from other counties in the same category. While each threshold is individually meaningful because the ARC index is non-additive, taken together it is difficult to decipher differences within each category. Moreover, the lack of an additive continuous measure highlights a problem: a very insignificant shift in one of these three variables can cause a highly significant change in "outcome." Therefore, if a county is close to a relevant "cutoff" level for poverty, unemployment, or income, a very slight shift in one of these values can cause a distress ranking change. In other words, because the ARC measure reduces the data to categories, change would be more reflective of *where* the county was along the three scales rather than the *magnitude* of any changes themselves.

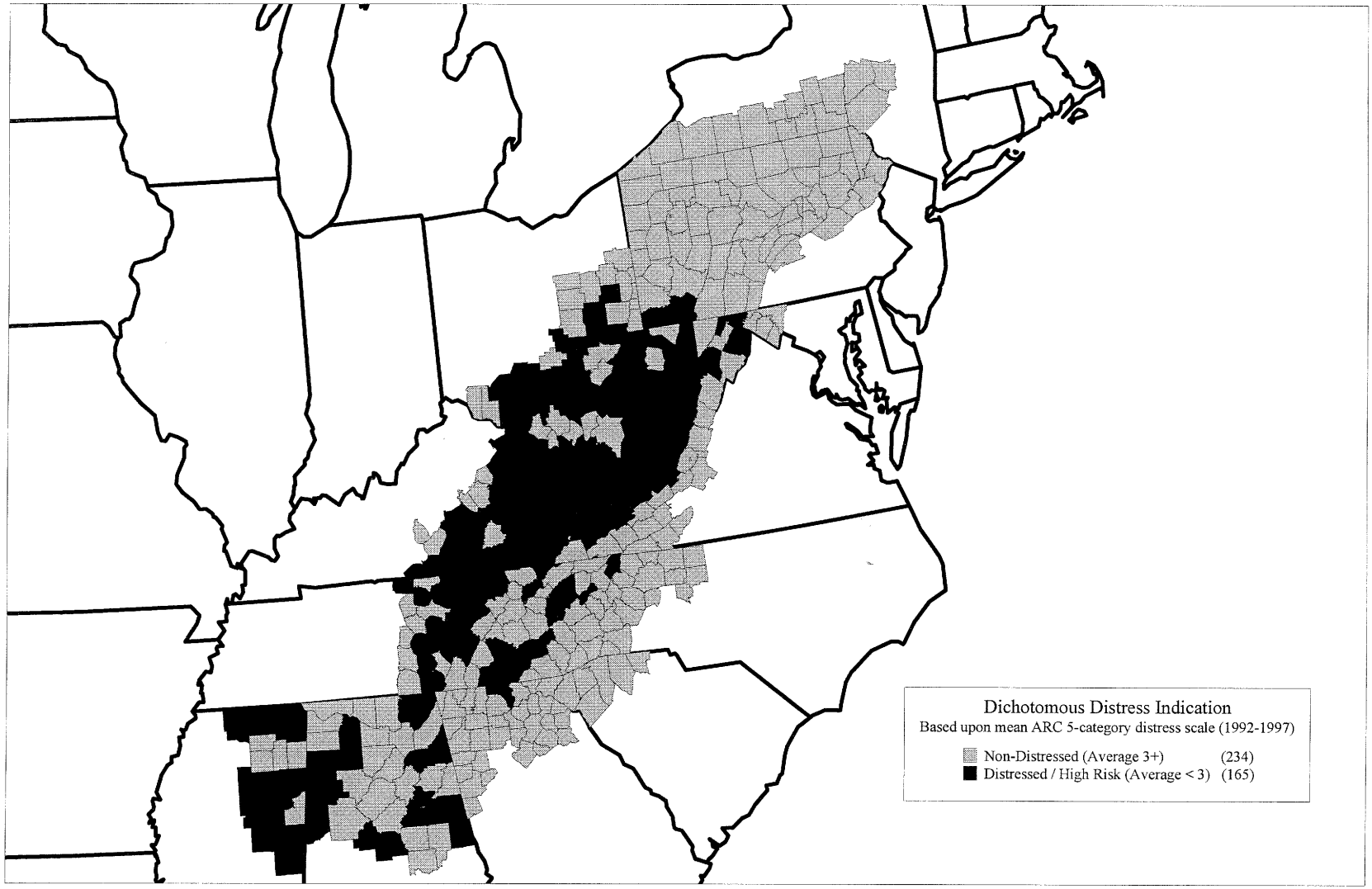
Related to this problem is the fact that county-level poverty is determined only once every decade—at the decennial census. Second, because of the influence of the poverty rate, year-to-year movements in distress status are a function primarily of shifts in market income and unemployment. And of those two, unemployment is by far the more volatile indicator. Thus, the year-to-year instability of rankings on the 5-point scale, and the probable lags among unemployment, poverty, and income, and variables that might underlie such measures, render

it difficult to pinpoint secondary variables that make significant contributions to status level and status-level changes.

To isolate the problems described above, we began our exploratory analysis by computing the average distress level of the 399 ARC counties along the 5-point scale over the relevant time period. Based upon this calculation, we then considered distress level as a binary variable: counties with average distress values of greater than or equal to 3 were considered non-distressed for the time period. Those counties with a distress level of less than 3 were considered distressed. Although a rating of lower than 2 is needed to be considered distressed by the ARC, we placed those counties with average values less than 3 into the distressed group, as counties falling into this range must be considered in jeopardy. We do this primarily for statistical purposes.

Figure 3 (Average Distress Status, 1992–1997) is a map displaying the spatial distribution of the two groups of counties. There is a relatively well-defined pattern of non-distressed counties. Much of the northern portion of the ARC region—specifically, New York and Pennsylvania—is non-distressed, as is a significant grouping of counties along the eastern and southeastern margins of the region. Distressed counties are most clearly evident in the dissected plateau regions of eastern Kentucky and portions of West Virginia. There are pockets of both types of counties in the deep south. This general pattern of distress and non-distress echos that described by Isserman (1996a,b) and Couto (1994), where it is shown that the central portion of the ARC region is, and has been historically, the subregion displaying

Figure 3. Average Distress Status, 1992-1997



the greatest level of economic hardship. These results also mirror Jerome Pickard's comparison of distressed counties in 1959–1960 and 1980–1986, in which he found that:

> The axis of "hard core" severely distressed counties extends from Preston Co., WV, southward through eastern Kentucky to the Tennessee Cumberlands. Most of the counties which deteriorated to severe distress were west of this axis in Kentucky or to the southwest in Tennessee, Alabama, or Mississippi, with only a few scattered counties to the east or southeast. Most of the counties which improved from severe distress in 1959–1960 were south and east of this axis, with a few farther north in southern Ohio and Pennsylvania (Pickard, undated).

Our re-coding of counties into a binary designation based upon average distress levels over time, while ignoring some of the more subtle differences in yearly county status and status change, does preserve the major trends outlined above. Although by including those counties with a score < 3 in incorporated areas which were not severely distressed, experimentation with simply plotting those counties with a score of < 2 did not reveal demonstrative differences in the general results. The spatial pattern of distress was slightly more compact, but nonetheless the overall pattern prevailed. As we treated this analysis as exploratory to define the boundaries of the problem, we chose to draw the circle around counties facing difficult economic circumstances rather broadly, particularly given the limitations of the indicators underlying the measure.

Part IV: The Development of an Alternative Distress Index: An Index of Economic Health

4.0 Introduction

In an effort to retain as much information about the experiences of distressed counties as possible, we developed a surrogate index which we call an index of "economic health," which simultaneously captures the underlying characteristics of interest to the ARC (unemployment, income) and additional characteristics that relate to the health and

effectiveness of the local labor market (percent of population that is economically dependent and the share of income from transfer payments).

There is precedent for including other variables in the distress index. In 1974, ARC Demographer Pickard experimented with the construction of a composite indicator of socioeconomic status. He constructed four indexes: poverty-population; low educational status; labor force participation and unemployment; and substandard housing. He combined these factors into an additive index. Based on this analysis, he rank-ordered the counties (see table in Appendix B). Like our index, a good score equals a low number and a bad score equals a high number. The results are predictable given the conditions of the region. Using Pickard's index, counties with high scores, and therefore low socioeconomic status, were similar in ranking with those designated 20 years later by the ARC as severely distressed counties. In the top 50 counties based on Pickard's ranking, 29 were in the state of Kentucky and another 12 were in Tennessee. Additionally, 14 of the original 18 Kentucky counties designated severely distressed were in the top 50 troubled counties based on Pickard's 1960 combined index. Of the original 13 ARC distressed counties in Tennessee, nine were in the top 50 on Pickard's index. Familiar names such as Owsley, Magoffin, McCreary, and McDowell (counties in Kentucky) and Lincoln, Webster, and Calhoun (counties in West Virginia) exhibit low levels of economic health over the entire 35-year period.

4.0.1 Elements of Index of Economic Health. After considerable deliberation, we chose to develop an additive index that includes four ratios. Drawing in part on the ARC's traditional measures of economic health, but with some significant additions, the four individual measures are: a per-capita market income index which compares a county's income

level to the national level ($PCMI_{idx}$); an unemployment rate index which compares the county-level unemployment rate to the national unemployment rate (URT_{idx}); a labor force to total population ratio index ($LFPOP_{idx}$); and a per-capita transfer payments to per-capita market income ratio index (TFP_{idx}). The use of these four indicators was designed to shed light on the degree to which the experience of individual counties deviates from national norms. The inclusion of a measure of transfer payments and of a labor force participation was designed to assess the extent to which the population depends on external sources of unearned income (transfer payments) and the share of the population that depends on the labor of others. We were concerned about the availability of underutilized human resources; similarly, we also were interested in the extent to which large segments of the population were not participating for any reason in wage-earning activities. For more detail on and further specification of the variables in the index, see Appendix C.

4.1 Evaluation of the Index

The strength of our index is that it not only allows annual analysis of a county's condition, but it also allows us to examine county conditions which were heretofore obscured by the ARC five-category designation. We can now examine each county relative to others and we can evaluate changes in county scores through time. At the same time, the index allows us to examine the condition of counties on an annual basis. The intent in developing the index of economic health is to assist the ARC in improving its ability to rank counties more precisely with the most current and accurate data. With our index we can examine absolute and relative conditions of counties through time. We can examine county scores on the overall index and the underlying index components. This measure also allows us to use the most recent county-

level data available, and the continuous nature of the scale allows differences between counties to be viewed more easily.

Overall, this revised measure appears to reflect the concerns of the current methodology well, and has high overall reliability (see Appendix D for a review of reliability measures associated with the index; see Appendix E for a discussion of the relative volatility of the index components). Our measure also allows us to compare its powers of classification with the original ARC county groups. There is a high degree of overlap between counties that score high on distressed measures using the ARC definition versus our index of economic health (see Appendix F). Thus, we present the index in a suggestive way as *an* alternative to current practice.

In the following pages, using the index, based on income, unemployment, share of transfer payments to total income, and labor force participation rates, we analyze the spatial and temporal patterns of distressed status in the Appalachian region over the period 1980–1995, or roughly, the period of time the Distressed Counties Program has been in existence at the Commission. Finally, we present an econometric analysis of ARC county-level distress, using socioeconomic and geographic variables to predict distress index scores.

4.2 Examining the Alternative Measure of Economic Health of ARC Counties

The combined scale index is utilized to examine economic trends in ARC counties over the past 15 years and to further illuminate temporal and spatial patterns of economic health. Results indicate several important trends. First, there has been little discernable change in aggregate regional health since the inception of the Distressed Counties Program in the early 1980s. A large number of the original ARC designated counties still exhibit low levels of

economic health. Although 28 of the original 67 designated counties are in the top 50 counties with the highest scores on our index of economic health (see Appendix B for Pickard's index ranking; see Appendix G for the 15-year average index of economic health), there has been movement for some of the original counties. Twelve of the original 67 counties had scores less than 150; several, such as Dawson, Georgia, Coosa, Alabama, and Clay Counties in Tennessee, were considered distressed in 1980 because in the year the first distressed counties were identified, these had an unusually high infant mortality rate which subsequently decreased significantly by the next census.

At the same time, however, a clear spatial pattern of persistent distress is evident. Problems are particularly acute for nonmetropolitan (nonmetro) counties and counties with small populations. Second, there is significant socioeconomic differentiation among the counties in the region, based on their relative score. Those places with the highest scores (worst condition) tend to be located in the central portion of the region, embrace resource-based economies, and are geographically remote. Distressed counties in the southern portion of the region represent old agricultural economies that did not move to newer forms of economic development, particularly services or tourist development. Many depend on low-wage manufacturing, which is highly susceptible to fluctuations in business cycles and longer-term economic tends.

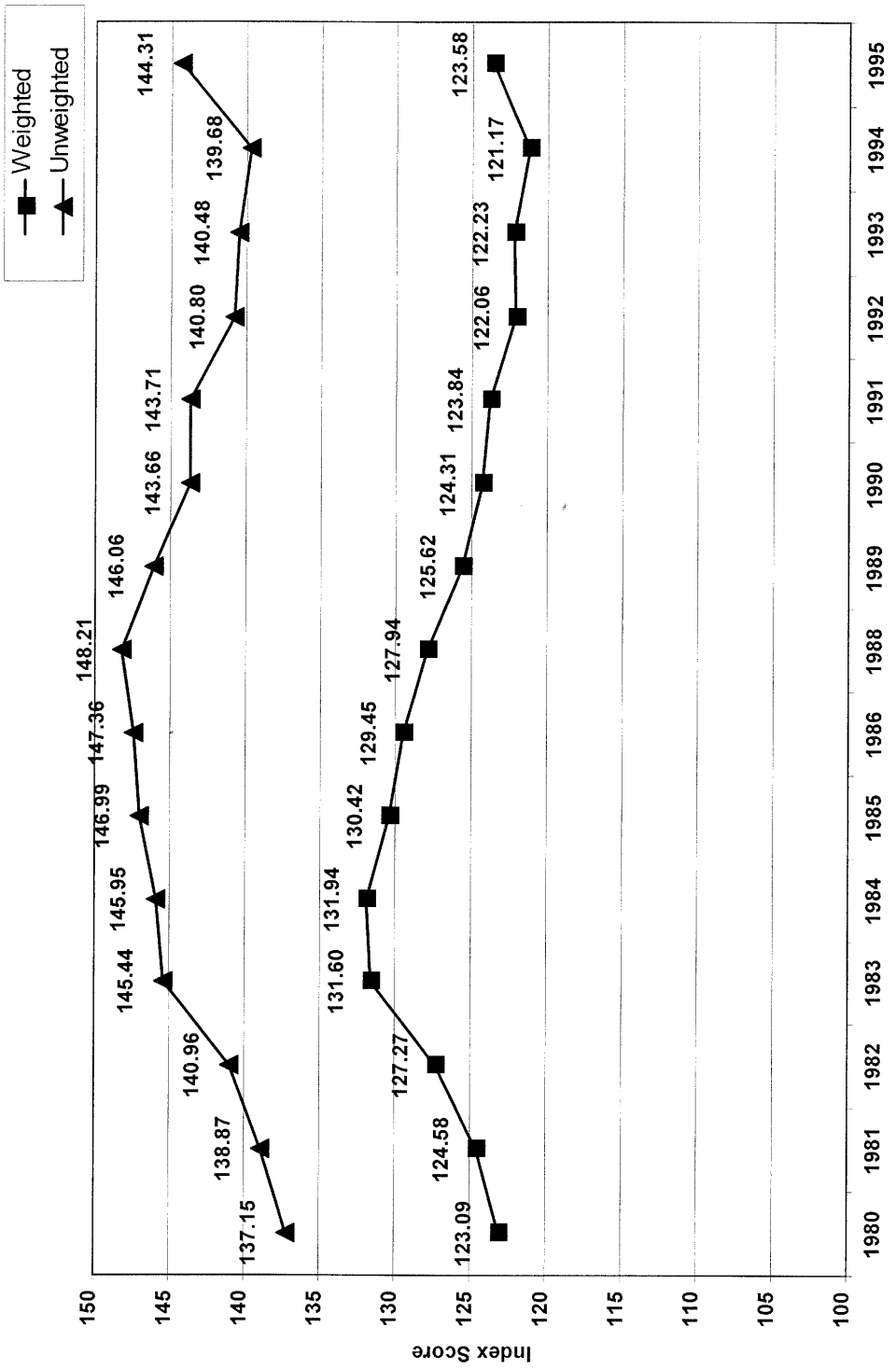
4.2.1 Aggregate Regional Health Through Time: County-level Experience Controlling for Size of Population. A primary question of interest is whether counties in the Appalachian region have significantly improved their status today compared with 1980, just prior to the Distressed Counties Program. To assess the overall economic health of the region, the raw

average county-level index and the index weighted by county population were calculated and plotted by year. The results are shown in Figure 4 (Mean Regional Index, 1980–1995). The unweighted index is the simple average index score across the 399 ARC counties—in other words, all *counties* are treated equally (small and larger counties are treated the same). In contrast, in the calculation of the weighted index, county scores are weighted by yearly Bureau of Economic Analysis (BEA) population figures—thus, counties with larger populations are counted more heavily in the calculation of the region's overall score. Comparison of these two different groupings demonstrates the significant differences in the experiences of large and small counties.

The most immediate result observable in the figure is the significant yearly difference between the two lines; in particular, the unweighted index is consistently higher (indicating lower levels of economic health) than the weighted indicator. This difference suggests that large places (measured by population) have generally *lower* index scores and thus experience better economic health compared with smaller places. In other words, they are better off. This trend is consistent throughout the period, and in fact seems to have intensified through time.

The overall cyclical trends in both lines are fairly similar. After a rapid decline in overall economic health into the mid-1980s, a slow improvement occurred into the early 1990s. However, the unweighted index shows a slower and less pronounced recovery than the weighted index, again suggesting a difference in kind between large and small places. Further, when all counties are weighted equally, the recovery never reaches 1980 levels—thus, measured in this way, *smaller counties* appear little better off and in some sense could be considered worse off than they were in 1980. When the index is weighted for population the

Figure 4. Mean Regional Index, 1980–1995



recovery in economic health steadily reaches 1980 levels (and even dips slightly below). Measured in this way, it would seem that overall regional economic health is about the same today as it was in 1980. In an important sense this is partly due to stagnation of incomes nationally. Prior to 1980, national income levels were continuing to rise, although they were slowing by the beginning of the decade. After 1980, with the deep economic recession of 1982, followed by economic turmoil throughout most of the 1980s, income levels stagnated and job generation became much more erratic. Thus, to some extent, what we see happening in distressed counties mirrors broader national trends.

There is a sharp increase in index levels between 1994 and 1995, reminiscent of economic decline in the early 1980s. This trend has been observed by ARC staff investigating basic statistics on the region. As Greg Bischak, ARC senior economist, suggests, it appears that the trends in the region are counter-cyclical relative to national conditions. The nation is pulling away from ARC counties in a period of significant national development.

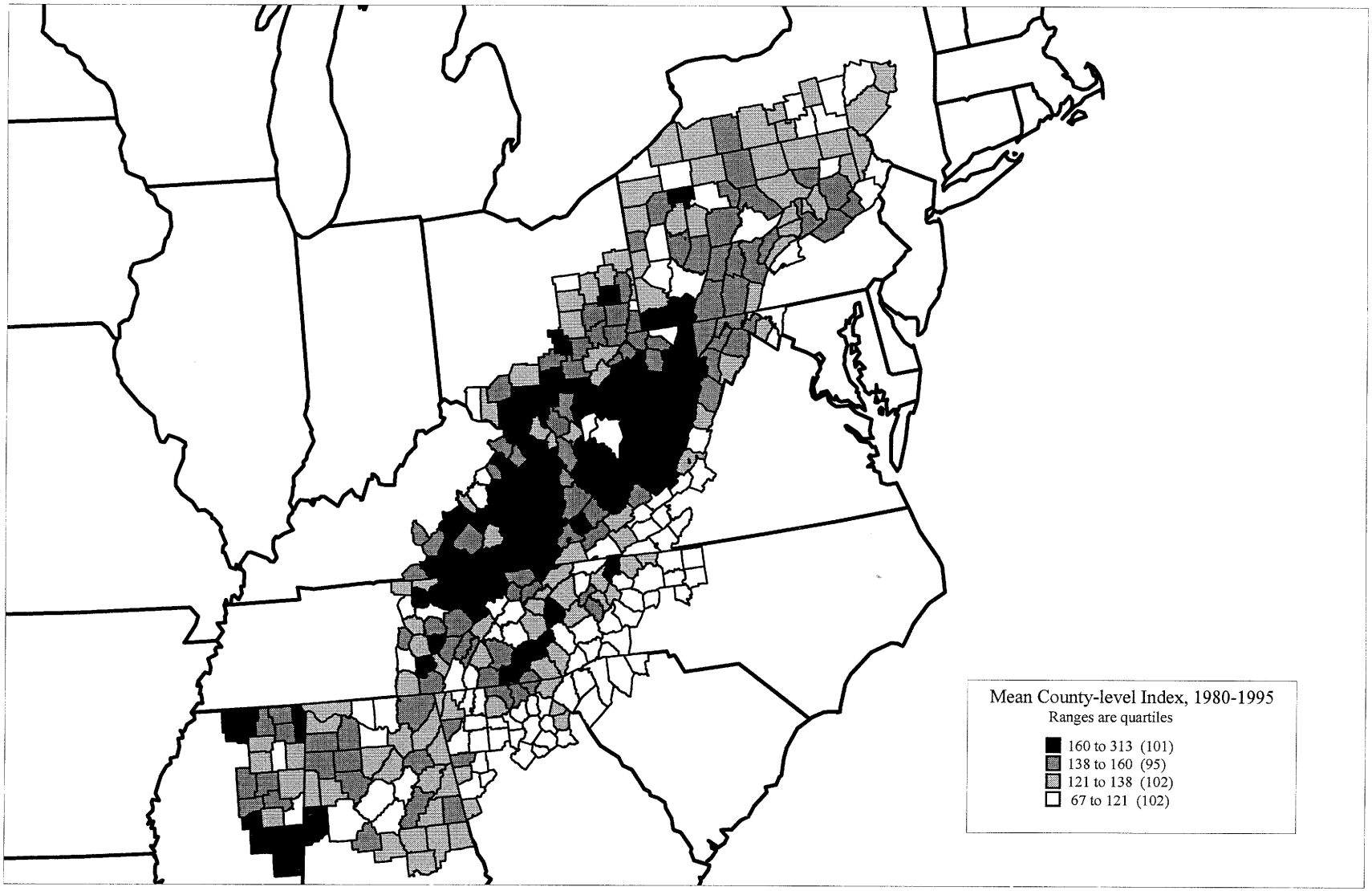
These results are not unique and are in fact mirrored by those of other researchers examining the experience of all counties considered distressed by the U.S. Department of Agriculture. Mark Nord, ERS economist, noted in his study of persistently distressed areas that:

> In the 1980s, both of these patterns (decline in poverty rates and persistent poverty counties in the 1950s and 1970s) disappeared or were greatly attenuated. The mean poverty rate of non-metro counties increased by about one percentage point from 1979–1989, and that of persistent poverty counties increased about 1.5 percentage points. Although, as in the previous two decades, the counties escaping from persistent poverty status were at the fringes of the high poverty cores (including central Appalachia), those counties represented a much smaller proportion of persistent poverty counties than in the previous two decades (Nord, 1998, p. 10).

The decline of persistent and severely distressed counties in the 1950s and 1970s is correlated with the significant expenditure of national funds for the eradication of poverty. Looking back on the expenditure levels of the ARC alone, funds in the program's early years dwarf those of later years, particularly for social welfare improvement and community well-being. As our results will show, the edges of the ARC region have dramatically improved over the last 30 years, paralleling Nord's findings for persistent poverty counties throughout the nation.

4.2.2 The Spatial Pattern of "Distress" in the Appalachian Region. To examine the patterns of average distress levels in the region over the study period, the average index score for Appalachian counties was calculated for the time period 1980–1995 and mapped (see Figure 5. Mean County-level Index, 1980–1995). Based on our index, the patterns of distress look quite similar to those based on the ARC's distressed measure. Counties in central West Virginia, eastern Kentucky, and northeastern Tennessee comprise the focal areas of "hard core" distress. Examining the top and bottom 25 percent of counties based upon mean index scores reveals a now familiar pattern. Counties in the top 25 percent based on mean index score (those most closely resembling national conditions) are primarily located along the southeastern margins of Appalachia. This includes many counties in Georgia, all of Appalachian South Carolina, and eastern regional sections of North Carolina and Virginia. The greater Pittsburgh, PA, and Binghamton, NY areas also are among the "healthiest" places as measured by the

Figure 5. Mean County-level Index, 1980-1995



combined index. Marginal counties—in the middle two quartiles of mean index scores—are spread relatively evenly throughout the region.[5]

The improved economic health of the counties along the edge of the region and those in the southern subregion are the result of two separate and in some cases related trends. The first and overarching trend is the industrialization of the U.S. South in the second half of the 20th century. Public-sector investments in infrastructure, including roads (interstate highway program), power provision (the TVA), and military base training facilities, served to fuel development of the South (Glasmeier and Leichenko, 1996; Glickman and Glasmeier, 1989; Markusen, Hall, Campbell, and Detrick, 1994). One need only consider the meteoric rise of the skylines of cities such as Charlotte, NC, along Interstate Highway 85 (which have sprung up in the last 20 years), to gauge the tremendous transformation of the South.

Improvements along the edge of the ARC region are more properly the result of the luck of location. Along both the western and eastern edges of the region major urban centers such as Washington, DC, Roanoke, VA, Greensville/Spartansburg, NC, and Cincinnati, OH, have grown prosperous over the post-war period. In some sense, the probability of this growth was preordained, in part because the edge locations also were those that received funds under the growth centers program (ARC Staff Evaluation, 1965-1968, 1968; Burlage, 1972). In the original program conception—that by concentrating investments, development would occur—those places most connected to the rest of the national economy and with larger populations

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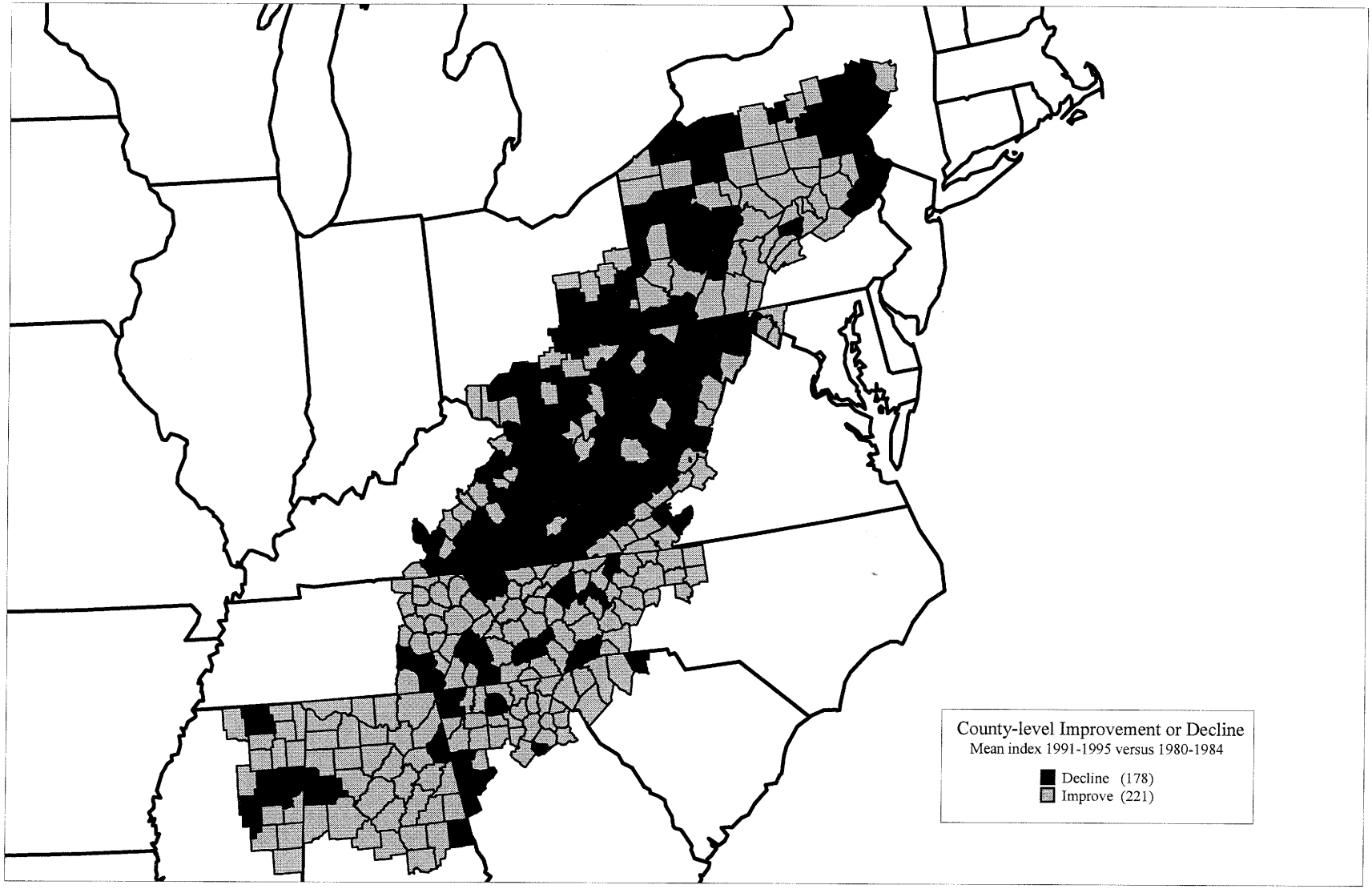
[5]A quartile is calculated by dividing a data distribution into four equal size groups. Quartiles are commonly referred to by their order in the distribution (i.e., top quartile), bottom quartile.

were counties along the region's edges. Thus, it comes as little surprise that these locations have done relatively well over the last 20 years.

4.2.3 ARC's Distressed Measure Compared with Our Index of Economic Health. In an effort to determine the overlap between the ARC distressed measure and our index, we compiled a graph (see Appendix F) that compares the ARC rating with our index. The results are quite striking. Those counties designated 2 or lower also score very high on our index of health, signifying that these locations suffer from poor or low economic health (high score indicating poor economic health). The results suggest, too, that like the ARC's designation, those counties with a level 5 rating perform at or below national averages based on our measure. These are the more urbanized and border portions of the region. Both our measures clearly identify places with very good and very poor economic health.

4.2.4 Which Counties are Improving . . . and Declining? As part of the original conception of the distressed index, the ARC envisioned being able to discern counties that have done well versus those that have failed to make progress toward national standards. In previous sections we have shown that places with larger populations have consistently done better (on average) than those with smaller populations. To visualize change over time, a mean county-level index was calculated for the first five years in the period (1980–1984) and compared with the most recent five years for which data are available (1991–1995). The map in Figure 6 (County-level Improvement or Decline) shows the change over time on a simple dichotomous scale. Declining counties are highly clustered in central Appalachia, primarily in Kentucky, Ohio, and West Virginia, though significant clusters of decline also are apparent in western Pennsylvania and in the southern tier counties of New York state. We attribute this decline to

Figure 6. County-level Improvement or Decline: Mean Index 1991-1995 versus 1980-1984

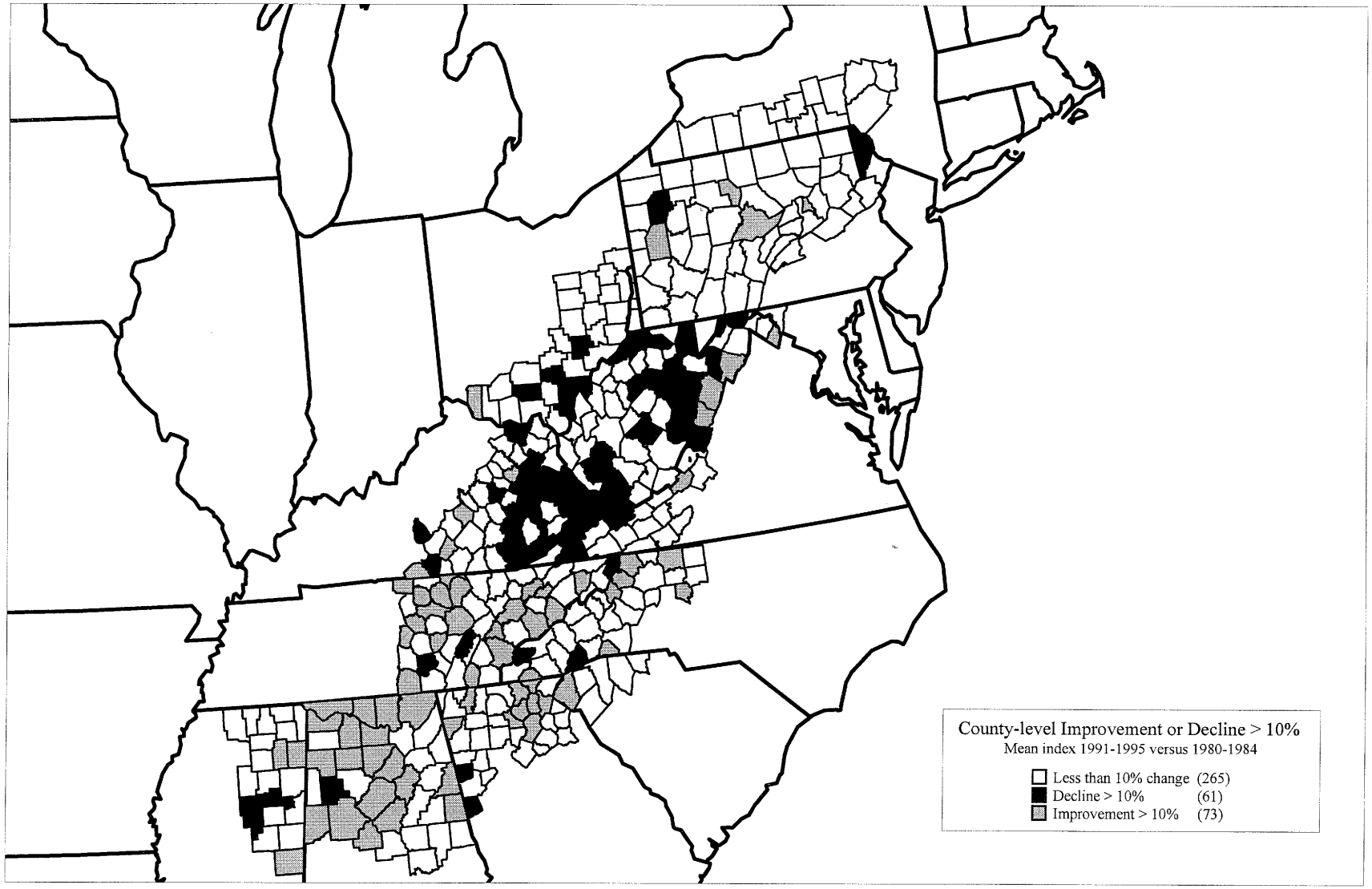


the general economic malaise experienced in this part of the ARC region since the early 1980s, which is tied directly to the decline of major industrial employers such as IBM and General Electric, as well as to fabricated metal producers such as U.S. Steel (according to personal interviews with county officials in the southern tier region). Only a smattering of counties experienced a decline in economic health south of the southern Kentucky and Virginia state borders. On the contrary, much of the southern portion of Appalachia experienced an improvement in economic health, as did many counties in central Pennsylvania. These results only serve to confirm those of the Economic Research Service, which suggests a widespread improvement in the fortunes of formerly persistently impoverished counties in the southern U.S. over the 1960–1990 period.

To see where relatively significant changes occurred between the beginning and end of the study period, a second map was created (see Figure 7. County-level Improvement or Decline $> 10\%$, and Appendix G) to single out those counties where mean index values had changed by more than $\pm$ 10%. Approximately two-thirds of all ARC counties had less than a 10 percent change between the beginning and end of the period. Of the counties with significant negative changes in economic health, the vast majority were again in the states of Kentucky, Ohio, and West Virginia. Counties exhibiting significant improvement were highly clustered in the southern portion of the region, including many in the states of Alabama, Georgia, and Tennessee.

To assess the relative stability of ARC county-level economic health throughout the study period, as well as to compare our index of economic health with that created by ARC staff demographer Jerome Pickard in 1960, Spearman rank-order correlation coefficients were

Figure 7. County-level Improvement or Decline > 10%: Mean Index 1991-1995 versus 1980-1984



calculated between index scores for 1960 and the average of our index score for 1980–1995. As seen in Figure 8, the first result to point out is that the rank correlation between the two indexes is surprisingly high. The correlations between the 1980–1995 index and Pickard's 1960 index of economic health data also are quite high. Between 1960 and 1995, the range of coefficients between the current index and the 1960 data is 0.517–0.606. This is quite interesting given that it has been 35 years since the data used by Pickard were compiled by the census, and also because his index measured different county-level statistics than does the current measure. This suggests that the underlying economic conditions tapped by Pickard's index and our own are surprisingly similar. To the extent that there are differences, some of the improvements that have already occurred in the region, such as improvements in counties of the south and along the edge of the region, could help to distinguish between the two points in time. As Pickard's own analysis makes plain, while changes did occur in the region over the 1959–1960 and 1980–1986 period, the poverty axis taking into account West Virginia, the coal fields of Kentucky and Tennessee, and portions of the Mississippi Delta, remained largely intact and otherwise unchanged.

To assess the performance of counties over the 1980–1995 time period in relation to Pickard's index, we divided counties into four equal size groups, ranging from the lowest to the highest based upon their distressed index score as calculated in 1960. We then plotted the unweighted mean index score for each of the four groups throughout the study period. The results are shown in Figure 9 (County Performance, 1980–1995: Pickard Quartiles). The two "best" groups of counties remain relatively clustered through time—with mean scores mainly falling in the 120–130 range—and are, at times, virtually indistinguishable from one another.

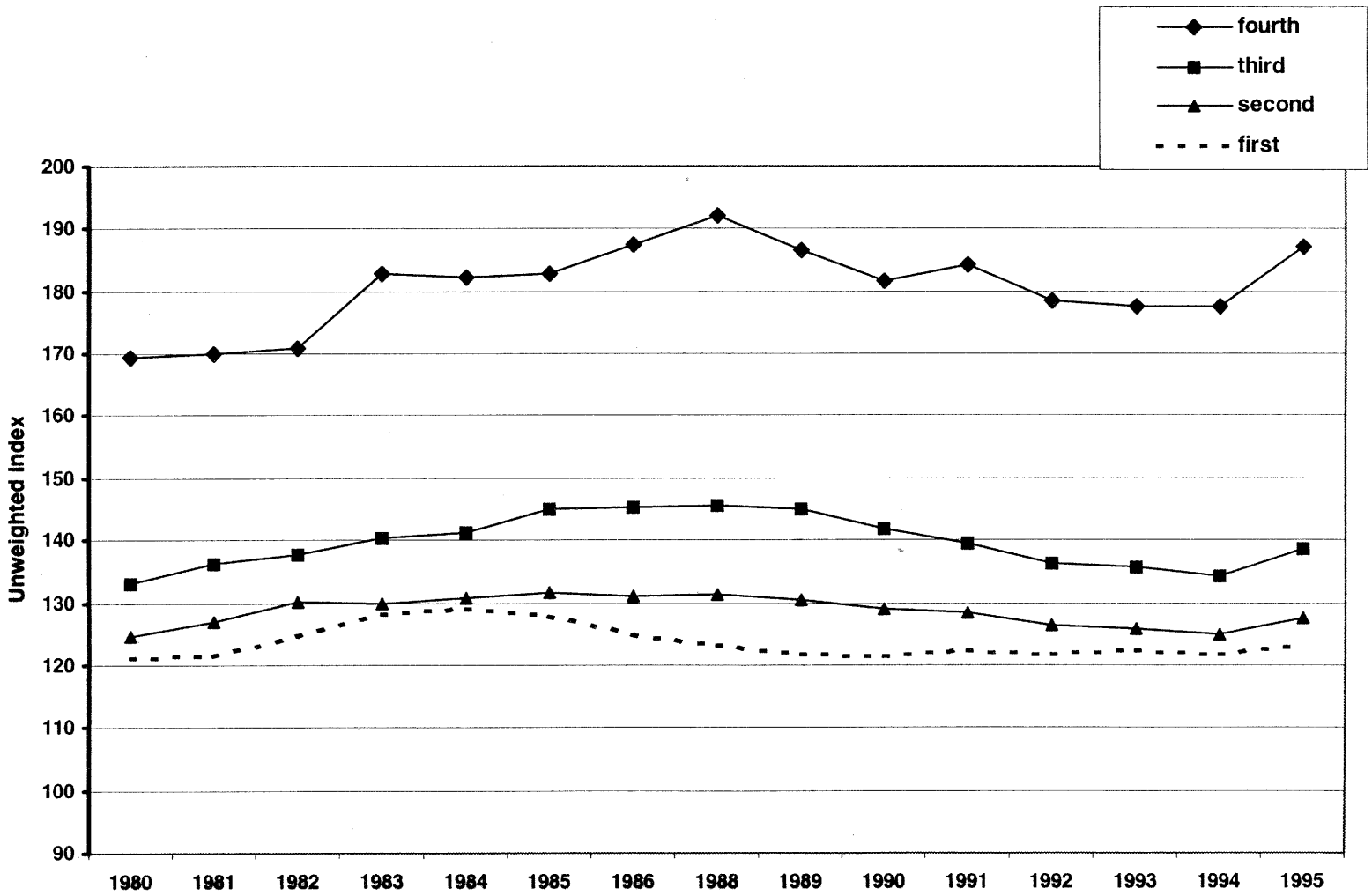
Figure 8. Rank-order Correlation Coefficients[a]

	1960 Pickard	1980	1981	1982	1983	1984	1985	1986	1988	1989	1990	1991	1992	1993	1994	1995
1960	**1.000**															
1980	0.583	**1.000**														
1981	0.600	0.971	**1.000**													
1982	0.569	0.961	0.945	**1.000**												
1983	0.543	0.862	0.885	0.925	**1.000**											
1984	0.517	0.861	0.884	0.908	0.975	**1.000**										
1985	0.557	0.802	0.821	0.844	0.924	0.943	**1.000**									
1986	0.590	0.780	0.804	0.817	0.906	0.917	0.976	**1.000**								
1988	0.592	0.764	0.789	0.796	0.891	0.901	0.961	0.974	**1.000**							
1989	0.597	0.767	0.796	0.803	0.881	0.891	0.952	0.965	0.984	**1.000**						
1990	0.606	0.821	0.836	0.840	0.897	0.899	0.939	0.946	0.947	0.959	**1.000**					
1991	0.592	0.816	0.830	0.833	0.902	0.897	0.934	0.939	0.940	0.942	0.981	**1.000**				
1992	0.551	0.793	0.808	0.809	0.889	0.886	0.923	0.921	0.933	0.935	0.963	0.981	**1.000**			
1993	0.527	0.776	0.794	0.799	0.893	0.892	0.921	0.922	0.931	0.927	0.951	0.969	0.987	**1.000**		
1994	0.521	0.762	0.777	0.781	0.882	0.881	0.917	0.919	0.927	0.921	0.943	0.963	0.980	0.986	**1.000**	
1995	0.558	0.772	0.784	0.785	0.873	0.875	0.912	0.919	0.924	0.920	0.943	0.960	0.971	0.974	0.984	**1.000**

[a] Correlations are Spearman's rho. N = 399 except for calculations involving 1960 data, where N = 397. All correlations significant, $p < 0.001$

Source: Authors' calculations on index. See text for details.

Figure 9. County Performance, 1980–1995: Pickard Quartiles



The third group has mean index scores that are significantly worse than the top two groups of counties, with averages generally in the 135 to 145 range. The fourth group exhibits very high mean index scores throughout the time period, with averages ranging from about 170 to over 190. It also is interesting to note that the volatility within this group is significantly higher than in any of the other three groups. In all, the separation among the four groups is consistent through time. The "best" counties in 1960 are still the best counties in 1995. No systematic convergence of counties within the region is evident, nor does there appear to be convergence within any individual group towards national averages.

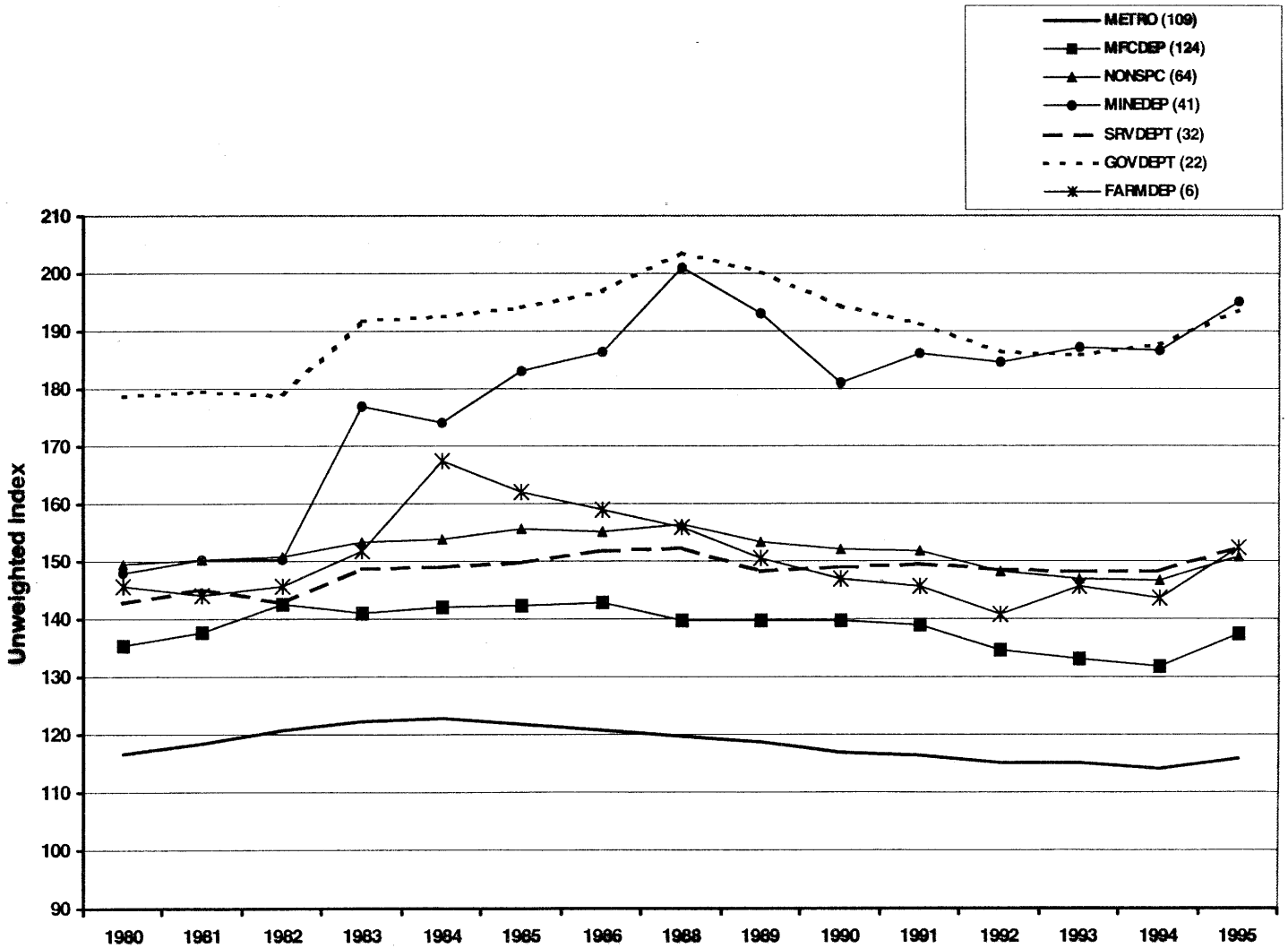
4.2.5 The Relationship Between County Economic Health Score and Economic Base.

There is longstanding evidence to support the hypothesis that the fate of many Appalachian distressed counties is related to the underlying economic base. The prosperous areas of the region have been beneficiaries of the decentralization of manufacturing over the post-war period. Additionally, as the case studies point out, many areas of the region that have been lifted out of distress were blessed with pleasing environments and beautiful scenery ripe for tourism development. At the other extreme, however, are areas of Appalachia that have been abused by natural resource exploitation that has seriously damaged the environment and left few alternative economic development possibilities in its wake. The region's central area and parts of the old plantation south have seen a slow and inexorable decline in their economies as the coal industry declined in size and extensiveness and agricultural lands were exhausted and became unfertile. Thus, we would expect a significant correlation between economic base and ranking on the index of economic health.

To assess the performance of counties with different economic emphases, we used the economic county typology devised by the Economic Research Service (ERS) to distinguish among ARC counties, and plotted (unweighted) county performance from 1980-1995 (see Figure 10. County Performance by ERS Type). We chose the unweighted index in order to preserve the differences among counties regardless of their population. This ensures that smaller counties have equal representation in the analysis. We also wish to emphasize or at least treat equally smaller counties to preserve the ability to compare these results with Pickard's earlier work on distressed counties in which he pointed out that the counties of greatest distress and those that worsened over the study period grew slowly and were very small in size at both the beginning and end of the period (Pickard, undated).

The typology distinguishes between metro and nonmetro counties with various economic foci, including manufacturing, mining, farming, services, government, and "non-specialized." Metro counties have clearly fared better than rural counties over the time period of interest. Counties with a reliance on mining and the government sector have fared very poorly, with mean county indices $>$ 180 for most of the 1980s and all of the 1990s. Over the remaining ERS types, manufacturing counties have performed the best over the time period, with mean scores at or near 140 for most years. Other county specializations are highly clustered in terms of index scores throughout the time period, with mean scores generally between 140 and 160. In summary, a strong positive correlation appears to exist between metro status and county performance. In addition, a manufacturing concentration also appears to have a positive relationship with economic health. Conversely, reliance on extractive

Figure 10. County Performance by ERS Type



industries or the government sector has a negative relationship with county-level economic health.

4.3 Summary

The information provided in this section is extensive. We have examined the ARC's index and noted its limitations, particularly those related to its categorical nature and its dependence on the decennial census poverty rate measure. We have offered an alternative measure of economic health that takes into account factors such as unemployment, per-capita market income, labor force participation, and share of income from transfer payments. This alternative index preserves the broad patterns of the ARC's index while allowing for annual inter-county comparisons over time. The pattern of distress is by now a familiar one: distressed counties form a core that has experienced little change over the last 20 years. Counties in West Virginia, Kentucky, Tennessee, and the Delta area of Mississippi have remained stagnant and largely unchanged over the last 20 years. The most improved counties are located along the edges and in the southern portion of the region. Comparisons of earlier ARC experimentation with indexes and the resulting analysis of distressed counties over the 1960–1986 period with our own analysis demonstrate considerable overlap. These results also suggest that the conditions of many of the most economically distressed counties indicate little change over the 1960–1995 period. In the next section we explore socioeconomic and geographic characteristics that seem to describe severely distressed counties.

Part V: Predicting Economic Distress: A Regression Analysis of Distressed Counties

In the previous sections we described the derivation of a continuous measure of county-level distress that can be calculated from readily available data on an annual basis. Further, we

have shown distinct spatial patterns in economic distress throughout the ARC region, and traced the performance of various groups of ARC counties through time. In this section, we devise a model to predict county index scores using a variety of relevant socioeconomic and geographic data.

5.0 A Statistical Model Estimating County-level Economic Health

Based on the index we have developed, we are now in a position to examine the index in relation to different socioeconomic variables which are important to the performance of regional economies and that simultaneously describe characteristics of Appalachian counties. In earlier analyses reported in Appendix H, we examined the one-to-one relationship between characteristics of Appalachian counties and our index. In the discussion in this section, we examine the contribution or influence of several variables simultaneously. This type of investigation allows us to determine the relative importance of multiple social, geographic, and economic characteristics on the economic health of Appalachian counties. This type of analysis is quite common, particularly as a basis for policy discussions. For example, ERS developed the same type of model to explore factors associated with the growth of rural areas in the 1980s. Multivariate regression analysis provides us with one means of summarizing the importance of characteristics of places in relation to their relative economic performance.

With the spatial and temporal patterns of distress identified, we developed a regression model to predict 1994 index levels.[6] In the current analysis, since the dependent variable is

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[6] Appendix I presents findings from an earlier logistic regression analysis based on ARC distressed categories which were combined into a binary analysis. The results of this analysis are quite similar to those reported here. The year 1994 was chosen because a variety of county-level variables had already been collected in conjunction with the logistic regression

continuous,[7] we employ (OLS) regression to predict index scores—using several of the same independent variables utilized in previous analysis. These variables include a number of 1990 Census variables and several measures of 1994 income characteristics. Socioeconomic variables include income from the manufacturing, services, retail, and government sectors, percent of income earned by residents working outside the county of residence, percent of the population with a college education, percent single female-headed households with children under 17, percent adults over 65, females as a percent of the labor force, and the share of establishments with less than 10 employees. (See Figure 11 for a description of the variables.) In addition, we include several geographic variables in the model. We include a variable that allows us, for example, to distinguish between counties that are on the edge of the region versus in the interior, and we also use a variable that allows us to examine the influence of intra-regional location (north, central versus southern, subregion). The variables included in the analysis are presented in Figure 11 (see table notes for technical details of variable inclusion). Additionally, a variable indicating proximity to a metro area also was included combined with a variable indicating whether the county is considered metropolitan based on the ERS Beale coding system.

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analysis of county distress for that year. In the logistic analysis we attempted to predict county distress or non-distress based upon 1992–1997 mean ARC distress rankings (measured on a 1–5 scale). In that analysis, we labeled all counties with a mean distress score of < 3.0 distressed, and all others non-distressed. The model was quite successful.

[7] The dependent variable is the natural log of the 1994 index values.

Figure 11. Linear Regression Model: Variables and Sources

Variable	Year	Measurement	Source
Percentage of income from manufacturing sector	1994	continuous	REIS
Percentage of income from the retail sector	1994	continuous	REIS
Percentage of income from the services sector	1994	continuous	REIS
Percentage of income from the government sector	1994	continuous	REIS
Female labor force as percentage of total	1990	continuous	U.S. Census
Percentage of establishments < 10 employees	1994	continuous	County Business Patterns
Percentage of population aged 65+	1990	continuous	U.S. Census
Percentage of population with BS degree	1990	continuous	U.S. Census
Percentage population female, single, with children < 17 years	1990	continuous	U.S. Census
County location: along the "edge" of the ARC region[a]	N/A	dummy	ARC maps
County location: metropolitan area[b]	1993	dummy	USDA
County location: adjacent to metropolitan area[c]	1993	dummy	USDA
County location: ARC subregion (north, south, central)	N/A	dummy	ARC

[a] Coded "1" for counties along the edge of the ARC region, "0" otherwise.

[b] Coded "1" for counties in metropolitan areas (Beale codes 0–3), "0" otherwise.

[c] Coded "1" for counties adjacent to metropolitan areas (Beale codes 4, 6, 8), "0" otherwise.

5.1 Model Results

Complete results for the regression model are presented in Figure 12 (Linear Regression Model: Predicting the 1994 County-level Index). Overall, the model was statistically significant.[8] It was extremely successful in predicting index values: the model successfully predicted 80 percent of the cases.[9] The table breaks the significant independent variables into two categories: socioeconomic and geographic.[10] Variables within each category are listed in descending order of strength in measuring the relationship between the dependent and independent variables.[11]

Eight socioeconomic variables were significant predictors of distress status. Percent of population with four-year college degrees, percentage of income from manufacturing, and percentage of income from residential adjustment were significant[12] and have positive relationships with county economic health. (Note that since a lower index value indicates relatively greater economic health, a negative coefficient is associated with better economic performance.)

The percentage of the population which are single mothers with children under 17, females in the labor force, and over 65 years of age have negative relationships with economic

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[8] Significant at the $p < 0.001$ level.

[9] The R^2 was 0.797 and the adjusted R^2 was 0.789.

[10] The "t" statistics is a measure of the strength of the relationship between the dependent and independent variables.

[11] See Appendix J for a discussion of regression diagnostics.

[12] Significant at the $p < 0.01$ level.

Figure 12. Linear Regression Model: Predicting the 1994 County-level Index

Dependent Variable: Log 1994 Index

Variable	Standardized Coefficient	Significance
Percentage of population with BS degree	-0.339	0.000
Percentage population female, single, with children < 17 years	0.314	0.000
Female labor force as percentage of total	-0.249	0.000
Percentage of population aged 65+	0.223	0.000
Percentage of income from the government sector	0.212	0.000
County location: "Southern" ARC subregion	-0.207	0.000
Percentage of income from the manufacturing sector	-0.157	0.000
County location: Metropolitan area	-0.151	0.000
County location: Along the "edge" of the ARC region	-0.126	0.000
Percentage of establishments < 10 employees	0.088	0.007
County location: "Central" ARC subregion	0.078	0.013
County location: Adjacent to metropolitan area	-0.055	0.052
Percentage of income from the retail sector	-0.032	0.271
Percentage of income from the services sector	0.000	.996

N = 387 due to missing data on source of income data for several counties.

Model Fit:
$R^2 = 0.797$
R^2adjusted = 0.789

Source: Authors' calculations on data described in text.

health.[13] In addition, a higher percentage of establishments with fewer than 10 employees and higher percentages of county income derived from the government sector also have negative associations with economic health.

In addition to the socioeconomic characteristics, five geographic variables were significant in the final regression model. Counties adjacent to a metro area were positively related to better economic health index scores.[14] Conversely, residence within the central region had a negative relationship with economic health.[15] The metro area, adjacency to the edge of the region, and southern region dummies were significant[16] and had positive associations with economic health.

5.2 Interpretation of the Regression Results

We believe these results can be used to infer some of the major challenges facing residents of distressed counties. Thus, we are carrying the analysis an additional step by suggesting that the socioeconomic condition of an individual in a distressed county carries along with it special burdens encumbering his or her ability to secure a satisfying, fulfilling, and self-determined life experience. First and foremost, as the county index of economic health deteriorates, residents in distressed counties display special circumstances. Distressed counties have a higher dependent population compared with more prosperous counties in the region consisting of single female-headed households with dependent children under the age of 17 and

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[13] Significant at the $p < 0.01$ level.

[14] Significant at the $p < 0.05$ level.

[15] Significant at the $p < 0.01$ level.

[16] Significant at the $p < 0.01$ level.

the percent of the population over 65. We know from national studies that single mothers tend to have very low incomes, live in or near poverty levels, and require access to support programs such as child care services and health care to work effectively in the wage-earning economy. We also know that single female-headed households face special difficulty in securing employment given the needs of children for parental support and oversight. Similarly, national studies suggest the elderly tend to experience low levels of income, have problems with mobility, and must rely on public programs, particularly for health care.

Human capital resources are scarce in distressed counties. Low numbers of the population with greater than high school educations are thought to signify a lack of local capacity represented by technically trained individuals capable of undertaking complex, skill-based jobs. Of considerable importance are the institutional implications behind these results. Distressed counties lack college-educated citizens. This deficit has implications for both the supply of and the demand for education. From the supply side, individuals need supportive institutions to encourage them to pursue higher education. Thus, the extent to which distressed counties lack effective secondary educational institutions contributes to the reduced number of citizens able to and interested in attending college. On the demand size, diminished interest in college is in part the result of a lack of role models that by example demonstrate the ability to achieve and to benefit from a college education. The complexity of this problem is well-known. Special efforts are required to bring the two sides of the issue effectively together.

Serious labor force issues reside within the region's aging population. Appalachia is facing a serious future labor shortage as the populations in distressed counties age in place while younger and more mobile residents seek opportunities elsewhere. The implications of

this development are quite significant. Any attempt at job attraction requires a community to have an adequate labor supply. Thus, changing demographics will place a premium on employer retention efforts through job training and skills upgrading as well as export promotion. More problematic and costly is the fact that an aging population is going to generate more demand for medical and social services, which will only further strain the local health care financing system. A growing elderly population will be least able to financially support the need for more social services and therefore is going to further burden the region's tax base.

The economy of distressed counties illustrates additional distinct attributes not usually associated with conditions of growth and development. These results suggest that, comparatively speaking, the sources of income relied upon by residents are not dynamic, but in fact reflect dependency. Distressed counties have not benefitted equally from the growth of manufacturing in the region over the last 30 years. Distressed counties lack manufacturing jobs, a quality seen as important in the success of other counties that have left the distressed category, as well as those rural counties that have more generally experienced significant progress over the last 18 years (Economic Research Service, 1996). The strong association between distressed status and income from the government sector has been interpreted by others as signifying the absence of other sources of employment (Economic Research Service, 1994). In many of the ARC distressed counties, government has become the employer of last resort.

The organizational structure of distressed county economies also presents significant challenges. The positive association between distressed counties and the share of small establishments with 10 or fewer employees signifies at least two trends. First, some have

argued that the absence of larger employers by default implies that small establishments represent high levels of self-employment. Second and relatedly, given the major role branch plant employment has played in the development of the ARC over the last 30 years, by implication distressed counties have not shared equally in this source of employment growth (Jensen, 1998). Other research suggests that an economic base dominated by small goods-producing establishments is negatively correlated with rural employment growth over the 1980s (Economic Research Service, 1996).

Beneath these broader trends is the specific geography of Appalachia. The geography of distressed counties is distinct and well-known. They tend to be very rural, remote from metro areas, and on the edges of the region, lacking adjacency to metro areas. These counties also tend to be concentrated in the central portion of the region, though as previous analysis indicates, there are important exceptions to this tendency.

Clearly, the description of distressed counties presented here represents a far more complex set of issues than can be dealt with by a program that largely emphasizes basic water and sewer services. In addition to the statistical analysis, we also can look back on the case study research to find important attributes of the region. Distressed counties have many needs, such as jobs, skills training programs, social programs to care for children (allowing parents to work), health programs to provide elderly and children with access to needed services, and geographic access to more developed portions of the region. While the Distressed Counties Program was never intended to eradicate the underlying problems facing these challenged areas, the original and far broader ARC program was. Evidence from the case studies of

successful counties highlights the importance of the early years of the ARC program where expenditures for education and community welfare enjoyed equal footing with infrastructure.

Part VI: Summary and Policy Reflections

The findings of this report can be stated simply: while some counties have made very good progress toward economic health, the majority of distressed counties continue to be held back by inadequate social and human infrastructures. Adequate infrastructures are needed to move toward a new future. The fates of those counties that have made it out of the most difficult conditions have been tied to a significant degree to early development trajectories, fortuitous locations, and access to funds for economic development and poverty alleviation much in excess of existing resources available today. There is little question that ARC, and federal programs more broadly, have certainly contributed to the change that has occurred in these counties. Nonetheless, other factors outside the control of the local area also have had an important influence on their success.

6.0 Using an Annualized Index

The development of an alternative index to identify, characterize, and track distressed counties provides a new window onto a serious problem. Building on the concept of economic health helps to focus policy concerns on the underlying challenges facing distressed counties and should help better direct the pursuit of solutions tailored more precisely to systemic problems. The development of an annual measure of economic health allows for much greater precision in sorting between short- and long-term problems. An annual index helps distinguish between cyclical changes (i.e., downturns in the business cycle) and structural changes (i.e., a shift from a goods-producing to service-producing economy) which should assist in

formulating policies targeted toward developmental versus short-term labor market adjustment problems.

The development of an annual index which has a significant range allows greater specificity in categorizing distressed counties. Clearly, some counties are on the verge of leaving behind conditions of distress. Many are in all likelihood actually doing comparatively well, given cost of living differences in the region compared with the nation. These counties would be close to the national average and thus may need specific assistance in the form of entrepreneurial training, leadership building, and skills development. At the other end of the spectrum are those counties whose extreme problems are associated with a degraded environment, small populations, and underdeveloped social institutions. For these communities, policies will have to be especially sensitive to the desires and capabilities of residents. Engendering new ways to build capacity and foster local empowerment are critical realms of consideration.

Finally, an annual measure will help identify those counties on the edge of distress. Such a finding could lead to programs specifically designed to push counties "over the edge" and out of distress. Regardless of the type of county, the ability to be more timely and precise in determining the characteristics of counties will help clarify and therefore ultimately overcome many of the challenges facing them. We recommend that the ARC conduct an assessment of an alternative index designed to capture distressed status. The ARC should consider weighting schemes as well as additional variables as part of a new index construction.

6.1 Revisit the Original ARC Program Design

While there are many possible explanations for the persistence of distressed counties, for the majority of such counties, the positive benefits of ARC programs have been muted by the fact that many were unable to receive funds under the initial program design. These places were small, isolated, and lacking in urban concentrations. They did not qualify under the growth center strategy embedded in the program from the start. Over time, in the absence of needed social and human infrastructure, these places have been unable to successfully compete with more urban-oriented counties found on the edges of the region and around its metro areas. They have not attracted the mobile jobs so important to the success of other portions of the region.

An acknowledgment that these counties have shown little progress in the last two decades should not be interpreted to mean that nothing can be done to change their current situation. Indeed, the fact that several counties have left the distressed status behind suggests that changes can and do occur. Moreover, unlike many of the counties that have left the group having benefitted from the early ARC program (ARC Staff Evaluation, 1968), the initial experimental design of the ARC has yet to be applied to these more remote locations. Thus, there is ample room to take the tremendous learning that has occurred over the intervening 30 years and use it constructively to build community-based programs that can help foster a spirit of new opportunity, new hope, and greater dignity.

ARC's legacy has included the role of opportunity broker. As an organization, the Commission has experience with many elements needed to overcome the region's serious economic health circumstances. Unlike in the past, where the focus was on developing the

areas most likely to succeed, the time has come to apply the wealth of experience gained by the Commission to emphasize a locally-based development process for those places left behind. While there is ample evidence to suggest that insights from past experience can be useful in facilitating change in distressed counties, the problems in these areas call for a new formula based on local capacity and assets-based development.

6.2 Using an Assets Approach to Development

Conventional economic and development practice typically revolve around identifying the weaknesses in the economic and social systems of communities and then prescribing ameliorative actions to make up those perceived deficiencies. These proposed "solutions" usually are in the form of some type of state (or firm) intervention that imposes cost reductions for greater economic efficiency. On the one hand, in the more advanced countries, regions, and cities, such actions have contributed to the generation of jobs and in many cases have contributed to improvements in the living experiences of community residents. On the other hand, for many regions, and especially communities that remain outside the mainstream of economic development, such measures have had surprisingly little effect, even after long periods of government intervention.

Recognizing the inability of conventional practice to resolve many of the development problems confronting distressed communities, a series of new policy initiatives are focusing on developing assets and community capacity from the ground up. There is a comparatively new, growing, and evolving framework of development practice emphasizing community assets in all their multifold dimensions. Beginning from a perspective that suggests that access to monetary assets is what separates poor communities from those more capable of and resilient

to changing global economic conditions, a growing body of research is recognizing the importance of social capital and other less tangible assets as bases for development.

Several policy options are embedded in the notion of assets-based development which complements existing ARC programs. ARC's recent experience with leadership programs provides a sound basis for formulating activities that emphasize the special needs of distressed counties. In order for communities to formulate realistic and meaningful proposals for their future, new leadership is needed. The ARC can begin the process through its LDDs. Within the area of leadership, some suggestions include the following.

6.2.1 Building New Leadership Through LDD Development. For the ARC to be more effective in formulating community-based development strategies, LDDs must broaden their base by working with new groups, citizens, non-governmental organizations, churches, and private funders in planning for development. The conventional skills associated with infrastructure development and branch plant attraction, while not irrelevant, must take second place to new capabilities and sympathies needed to facilitate the success of programs designed to assist distressed and high-need counties. LDDs should be given encouragement and incentives to partner with new players in their communities. They need training to partner with foundations to build on a new conception of development that emphasizes the building of community and individual assets in their multifold dimensions.

6.2.2 Using the Entrepreneurial Program to Help Distressed Counties. The high share of small establishments which are emblematic of distressed counties' economic bases should be harnessed through the development of a self-employment learning program. The most challenged entrepreneurs, those with limited incomes and in isolated areas, require consider-

ble support services in addition to the more typical small firm support activities. There is considerable knowledge of best practice in this area. The ARC could team with well-known practitioner groups to further develop ARC's recently established entrepreneurial regional initiative. In addition to the self-employment learning activity, the ARC should sponsor support programs that provide services to groups of firms. In the remote areas of the region there are numerous examples of firms imitating one another. In such a situation, economies of scale can be realized by identifying small clusters of firms that need basic business services.

6.2.3 ARC Cares About Health Care. Serious investments in health care infrastructure have not been made in many of the region's most remote locations since the 1970s. The ARC needs to revisit its original metric of having a clinic within 30 minutes of all residents. Hospital and clinic consolidations, combined with the movement toward group health care, have left many of the region's remote areas far from providing decent, accessible, and affordable health care. Today's problems take three forms: quality, cost, and accessibility. Importantly, ARC assistance is *not* needed to start health care services from scratch. However, assistance is needed to provide the technical support to insure that health care providers in the region are capable of applying for and successfully receiving competitive awards for remote service delivery and facilities support. The abundance of funding for transportation innovations in the new transportation bill may be used to fund mobile health clinics and other community health access approaches.

6.2.4 Children and Young Adults are the Region's Future. The conditions for children in the region are difficult, and in some cases need urgent attention. Six policy areas are critical. First, there is a need to assess how well the physical facilities for schools in the region

compare with those in the rest of the country. Second, the ARC should provide a forum for training local officials and educators to improve their ability to win more external program funds for early childhood development. The ARC could identify best-practice programs and establish a demonstration program to filter such experiences throughout the region. Third, the ARC could sponsor demonstration programs that seek to include parents in their children's school experience. Fourth, high school students need mentors and access to health education. The ARC could be instrumental in exploring financing alternatives to ensure that support staff are available in every school. Fifth, high school students need meaningful and pride-filled alternatives to college. The ARC could sponsor a demonstration program to highlight and disseminate model school-to-work programs throughout the region. Sixth, some evidence suggests that Appalachian students begin college but drop out by the end of their second year. Dropout rates are related to lack of resources and problems of transition. The ARC could stimulate the development of programs designed to help students stay in college and finish degree programs. These programs could take two forms. First, Appalachian students lack funding for higher education. The ARC could help identify funding sources, scholarship programs, and other support mechanisms to encourage students to pursue college. Second, a bigger and more immediate problem is keeping students who start college in college to successfully complete advanced education. Mentoring and transitioning programs are important to ensure students who are college-bound are able to make the transition successfully.

6.2.5 Community-based Jobs: The Right Alternative. In many parts of the region, the lack of skills, education, and previous work experience limits economic options for the

region's residents. Unlike areas in the region which are more metropolitan and therefore attractive to external investment, deeply distressed counties are often remote and distant from markets. An interim, grassroots job development program, building on the needs of residents in the region for quality housing, public facilities, and infrastructure, could help establish the base of skills needed to be successful in the future. The region boasts many community groups that provide job training and employment opportunities. These organizations need and deserve ARC support. Along with programs that are traditionally male-oriented, jobs programs also must serve the needs of women. Child care, in-home care for the elderly, and community mentoring are just a few examples of activities that could help support the labor market success of women.

In summary, it is worthwhile to look back at the ARC's original design, which has many merits. The problems of the most economically challenged areas are reminiscent of the past. Many of the original interventions could be reexamined and, where appropriate, reapplied, but with a new commitment to local involvement in planning and implementation. As an advocate for the region, the ARC must look back to its proud, meritorious, and comprehensive early view of the region's problems and act accordingly. While additional funds would be helpful, the lack of funds alone is not the primary problem. Instead, the challenge is to find the courage to embark upon a new plan that builds on the region's philosophical intent and built-up expertise.

References

Appalachian Regional Commission. 1995. *A Proud Past, A New Vision: Profile of a Program.* Washington, DC: Author.

Appalachian Regional Commission. 1995. *Internal Memorandum: Distressed Counties Policy Overview.* Washington, DC: Author.

Appalachian Regional Commission. 1992. Synopsis: Distressed County Designations. Unpublished report, August 27.

Appalachian Regional Commission. 1982. Transcript from the May 4th Commission meeting. ACE Federal Reports, Inc.

Appalachian Regional Commission. 1981. *A Report to Congress: From the Appalachian Governors Concerning the Appalachian Regional Commission* (December). Washington, DC: Author.

Appalachian Regional Commission 1968. Staff Evaluation, Appalachian Regional Development Program, 1965–1968. Mimeo. Washington, DC.

Bischak, G. 1998. Personal correspondence with the author.

Burlage, R. 1971. The People's ARC. In D. Walls and J. Stephanson (Eds.), *Appalachia in the Sixties.* Lexington, KY: University of Kentucky Press.

Butler, M., and C. Beale. 1993. *Rural-Urban Continuum Codes for Metro and Nonmetro Counties, 1993.* Washington, DC: U.S. Department of Agriculture.

Couto, R. A. 1994. The Future of the Welfare State: The Case of Appalachia. In P. Obermiller and W. Philiber (Eds.), *Appalachia in an International Context: Cross-national Comparisons of Developing Regions.* Westport, CT: Praeger, pp. 1–28.

Decker, R. 1994. *Internal Memorandum: Distressed Counties.* Washington, DC: Appalachian Regional Commission.

Fullenbaum, R., and M. McNeill. 1995. *Survey and Comparison of Distressed Area Definitions.* Report submitted to the Appalachian Regional Commission in partial fulfillment of Contract No. ARC 95-19.

Gaventa, J. 1980. *Power and Powerlessness in Appalachia*. Champaign–Urbana: University of Illinois Press.

Glasmeier, A., and N. Glickman. 1989. The International Economy and the American South. In L. Rodwin and H. Sazanami (Eds.), *Deindustrialization and Regional Economic Transformation: The Experiences of the United States*. Boston: Unwin and Hyman, pp. 60–89.

Glasmeier, A., and R. M. Leichenko. 1996. From Free Market Rhetoric to Free Market Reality: The Rise of the New South. *International Journal of Urban and Regional Research* 20(4).

Hansen, N. 1972. *Growth Centers in Regional Development*. New York: The Free Press.

Isserman, A. 1996a. *Socioeconomic Review of Appalachia: The Evolving Appalachian Regional Economy*. Paper prepared for the ARC in partial fulfillment of ARC Contract No. 95-13.

Isserman, A. 1996b. *Socioeconomic Review of Appalachia: Appalachia Then and Now. An Update of 'The Realities of Deprivation' Reported to the President in 1964.* Paper prepared for the Appalachian Regional Commission in partial fulfillment of ARC Contract No. 95-13.

Kusmin, L., J. Redman, and D. Sears. 1996. *Factors Associated with Rural Economic Growth: Lessons from the 1980s*. Economic Research Service, U.S. Department of Agriculture. Washington, DC.

Markusen, A., P. Hall, S. Campbell, and S. Detrick. 1994. *The Rise of the Gunbelt*. New York: Basic Books.

Nord, M. 1998. *Overcoming Persistent Poverty and Sinking Into It*. Paper presented at the Annual Meetings of the Southern Rural Sociological Association. Little Rock, AR.

Norusis, M. J. 1997. *SPSS Professional Statistics 7.5*. Chicago: SPSS, Inc.

Pickard, J. 1970. *Socioeconomic Indicators–1960, Appalachian Data for Counties*. ARC computer printouts.

Pickard, J. Undated. A Comparison of Conditions of Distressed Counties 1959–1960 and 1980–1986. Appalachian Regional Commission, Washington, DC.

Pickard, J. 1960. Data files, Appalachian Regional Commission, Washington, DC.

Russell, J. 1998. Personal correspondence with the author (June).

U.S. Department of Commerce. Various years. *Regional Economic Information System.* Washington, DC: Author.

U.S. Department of Commerce. 1997. *Consolidated Federal Funds Reports 1987–1996.* Washington, DC: Author.

Whisnant, D. 1994. *Modernizing the Mountaineer: People, Power, and Planning in Appalachia.* Knoxville, TN: University of Tennessee Press.

Appendix A. Beale Codes

Metro counties

0	Central counties of metro areas of 1 million population or more
1	Fringe counties of metro areas of 1 million population or more
2	Counties in metro areas of 250,000 to 1 million population
3	Counties in metro areas of fewer than 250,000 population

Nonmetro counties

4	Urban population of 20,000 or more, adjacent to a metro area
5	Urban population of 20,000 or more, not adjacent to a metro area
6	Urban population of 2,500 to 19,999, adjacent to a metro area
7	Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Completely rural or fewer than 2,500 urban population, adjacent to a metro area
9	Completely rural or fewer than 2,500 urban population, not adjacent to a metro area

Source: Butler, M. A., and C. L. Beale. 1994. *Rural-Urban Continuum Codes for Metro and Nonmetro Counties, 1993.* Beltsville, MD: Agriculture and Rural Economy Division, Economic Research Service, U.S. Department of Agriculture. Staff report no. 9425 (September).

Appendix B. Comparison of Rank-ordered Indicies

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Owsley	KY	309.85
McCreary	KY	284.85
McDowell	WV	276.33
Webster	WV	270.31
Clay	WV	256.00
Wolfe	KY	239.89
Summers	WV	236.44
Calhoun	WV	236.00
Lee	KY	234.37
Hancock	TN	225.11
Magoffin	KY	224.35
Lincoln	WV	223.30
Elliott	KY	222.74
Jackson	KY	218.73
Fayette	WV	218.19
Wyoming	WV	216.41
Letcher	KY	215.37
Clinton	KY	212.80
Menifee	KY	211.88
Clay	KY	209.94
Knott	KY	209.01
Morgan	KY	206.98
Braxton	WV	206.40
Adams	OH	204.80
Harlan	KY	201.97
Barbour	WV	201.84
Wirt	WV	201.46
Leslie	KY	201.25
Noxubee	MS	199.72
Campbell	TN	199.15
Logan	WV	198.98
Lawrence	KY	198.89
Roane	WV	198.85
Breathitt	KY	196.15
Scott	TN	196.04
Bell	KY	193.86
Whitley	KY	193.27
Graham	NC	192.92
Johnson	TN	192.18
Mingo	WV	191.37
Lewis	KY	189.74
Fentress	TN	189.07
Wayne	KY	187.95
Carter	KY	187.73
Knox	KY	187.25
Nicholas	WV	186.93
Swain	NC	186.64
Kemper	MS	186.04
Taylor	WV	185.93
Estill	KY	185.18

PICKARD INDEX

County	State	Index
Magoffin	KY	330.6
McCreary	KY	315.7
Leslie	KY	315.3
Breathitt	KY	315.0
Knott	KY	313.3
Martin	KY	309.7
Owsley	KY	308.3
Clay	KY	300.9
Wolfe	KY	292.3
Jackson	KY	291.0
Fentress	TN	288.0
Knox	KY	284.9
Lee	KY	283.4
Elliott	KY	283.3
Morgan	TN	280.7
Webster	WV	280.5
Lawrence	KY	279.5
Lincoln	WV	276.2
Clay	WV	273.1
Van Buren	TN	272.8
Rockcastle	KY	272.2
Scott	TN	269.8
Perry	KY	267.7
Menifee	KY	266.5
Lee	VA	266.0
Letcher	KY	265.8
Grundy	TN	264.7
Bell	KY	264.0
Wayne	KY	262.0
Hancock	TN	261.7
Powell	KY	260.4
Pike	KY	258.9
Pickett	TN	257.2
Clinton	KY	256.5
Morgan	KY	256.4
Meigs	TN	255.1
Bland	VA	255.0
Jackson	TN	254.2
Floyd	KY	253.9
Johnson	KY	253.7
Whitley	KY	252.4
Overton	TN	252.2
Campbell	TN	251.1
Casey	KY	250.4
Bledsoe	TN	249.5
Harlan	KY	249.2
Calhoun	WV	248.9
Claiborne	TN	248.1
Braxton	WV	247.9
Estill	KY	247.8

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Ritchie	WV	185.10
Cumberland	KY	183.34
Pocahontas	WV	183.04
Gilmer	WV	182.34
Scioto	OH	181.48
Grundy	TN	180.79
Cocke	TN	180.12
Rockcastle	KY	178.06
Morgan	TN	178.05
Mason	WV	176.87
Pickens	AL	176.49
Floyd	KY	175.97
Casey	KY	175.48
Tucker	WV	175.05
Benton	MS	174.48
Pike	OH	174.16
Russell	KY	173.60
Randolph	WV	172.67
Lewis	WV	171.52
Powell	KY	171.13
Overton	TN	170.96
Harrison	OH	169.36
Monroe	WV	169.28
Winston	MS	168.75
Vinton	OH	168.59
Bath	KY	168.50
Pickett	TN	168.36
Greenbrier	WV	168.00
Van Buren	TN	167.39
Jackson	TN	167.16
Greene	PA	167.12
Fayette	PA	167.05
Meigs	OH	166.94
Tishomingo	MS	166.80
Forest	PA	166.48
Lee	VA	166.46
Raleigh	WV	166.39
Marshall	MS	165.76
Lincoln	KY	165.53
Boone	WV	165.40
Cherokee	NC	164.69
Perry	OH	164.42
Choctaw	MS	163.90
Doddridge	WV	163.73
Jackson	OH	162.44
Perry	KY	162.29
Dickenson	VA	161.70
Preston	WV	161.61

PICKARD INDEX

County	State	Index
Dickenson	VA	247.8
Carter	KY	247.3
Summers	WV	245.6
Johnson	TN	243.2
Buchanan	VA	243.1
Clay	NC	243.0
Benton	MS	242.8
Mingo	WV	242.7
Cumberland	TN	242.2
Cumberland	KY	241.2
Lewis	KY	240.7
Russell	KY	240.6
Laurel	KY	237.7
Grainger	TN	237.7
Macon	TN	237.3
Union	TN	237.1
Noxubee	MS	236.0
Marshall	MS	235.7
Cherokee	NC	235.3
Clay	TN	235.2
Graham	NC	234.6
Swain	NC	234.0
Gilmer	GA	233.6
Choctaw	MS	233.5
McDowell	WV	233.0
Bibb	AL	233.0
Wise	VA	231.6
Bath	KY	231.3
Barbour	WV	231.0
Monroe	KY	230.6
Adair	KY	229.7
Roane	WV	229.3
Dawson	GA	228.5
Lawrence	AL	228.0
White	TN	227.7
Cocke	TN	227.6
Lincoln	KY	227.3
Pendleton	WV	226.6
Scott	VA	225.9
Avery	NC	224.6
Yancey	NC	224.3
Ashe	NC	224.2
Wirt	WV	224.1
Cleburne	AL	220.6
Fayette	WV	220.5
Heard	GA	220.3
Monroe	TN	220.3
Madison	NC	219.1

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Jackson	WV	161.19
Upshur	WV	161.05
Johnson	KY	160.69
Bibb	AL	159.84
Cambria	PA	159.62
Pleasants	WV	159.47
Lawrence	OH	158.77
Guernsey	OH	158.75
Marion	WV	158.19
Clay	NC	156.90
Gallia	OH	156.89
Huntingdon	PA	156.63
Mercer	WV	155.15
Grainger	TN	155.11
Wayne	WV	154.85
Hampshire	WV	154.74
Polk	TN	154.65
Wetzel	WV	154.62
Winston	AL	154.35
Fannin	GA	154.12
Claiborne	TN	154.03
Monroe	OH	153.63
Martin	KY	153.44
Cumberland	TN	153.23
Monroe	TN	153.18
Monroe	KY	152.89
Talladega	AL	151.90
Clinton	PA	151.83
Rowan	KY	151.75
Marion	AL	151.75
Noble	OH	151.65
Calhoun	MS	151.54
Hocking	OH	151.29
Webster	MS	151.27
Towns	GA	150.65
Pike	KY	150.21
Bedford	PA	149.67
Randolph	AL	149.54
Tyler	WV	149.43
Venango	PA	149.32
Meigs	TN	149.25
Pendleton	WV	148.62
Bledsoe	TN	148.60
Adair	KY	148.52
Allegany	MD	148.41
Tippah	MS	148.35
Athens	OH	147.96
Belmont	OH	147.30

PICKARD INDEX

County	State	Index
Fleming	KY	218.8
Kemper	MS	217.8
Webster	MS	217.6
Russell	VA	217.2
Marion	AL	216.6
De Kalb	TN	215.5
Pontotoc	MS	215.1
Union	GA	215.0
Pulaski	KY	214.6
Grant	WV	214.3
Fayette	AL	214.0
Itawamba	MS	213.7
Carroll	VA	213.7
Rhea	TN	213.5
Winston	AL	213.4
Prentiss	MS	213.1
Sequatchie	TN	213.1
Nicholas	WV	212.6
Pickens	AL	212.4
Tishomingo	MS	212.2
Jackson	AL	212.2
Lamar	AL	211.8
Vinton	OH	211.2
Rowan	KY	211.0
Logan	WV	210.8
Macon	NC	210.5
Boone	WV	210.4
Tazewell	VA	210.4
Banks	GA	210.2
Morgan	WV	210.0
Hardy	WV	209.9
Floyd	VA	209.9
Franklin	AL	209.8
Mitchell	NC	209.7
Highland	VA	209.6
Polk	TN	209.3
Walker	AL	209.2
Hampshire	WV	208.9
Union	MS	208.8
Winston	MS	208.7
Marion	TN	208.7
Madison	GA	208.0
Clay	AL	208.0
Doddridge	WV	207.3
Adams	OH	207.1
Chilton	AL	207.0
Franklin	GA	205.8
Towns	GA	205.3

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Walker	AL	146.90
Cameron	PA	146.66
Prentiss	MS	146.64
Alcorn	MS	146.35
Pulaski	KY	146.26
Somerset	PA	146.21
Union	GA	145.76
Mineral	WV	145.67
Chickasaw	MS	145.56
Harrison	WV	145.44
Sullivan	PA	145.27
Russell	VA	145.14
Morgan	OH	145.10
Rhea	TN	144.95
Franklin	AL	144.78
Armstrong	PA	144.38
Marshall	WV	144.25
Fleming	KY	144.15
Grant	WV	143.66
Jefferson	OH	143.42
Allegany	NY	143.40
Highland	OH	143.33
Garrett	MD	143.31
Lawrence	PA	142.87
Unicoi	TN	142.85
Montgomery	KY	142.83
Union	TN	142.61
Polk	GA	142.37
Schuylkill	PA	142.33
Clearfield	PA	142.07
Northumberland	PA	141.91
Lawrence	AL	141.79
White	TN	141.49
Clay	MS	141.14
Green	KY	141.12
Yancey	NC	140.99
Morgan	WV	140.95
Blair	PA	140.95
Jackson	AL	140.81
Buchanan	VA	140.21
Chattooga	GA	140.00
Cannon	TN	139.99
Marion	TN	139.95
Etowah	AL	139.54
Mifflin	PA	139.44
Carbon	PA	139.26
Potter	PA	138.76
Luzerne	PA	138.38

PICKARD INDEX

County	State	Index
Smith	TN	204.9
Gilmer	WV	204.9
Pocahontas	WV	204.6
White	GA	204.3
Raleigh	WV	204.3
St. Clair	AL	203.7
Wyoming	WV	203.4
Coosa	AL	203.4
Randolph	AL	202.9
Tucker	WV	202.8
Cullman	AL	202.8
Monroe	WV	201.5
Jackson	NC	201.2
Murray	GA	201.0
Cherokee	AL	200.9
Hawkins	TN	200.4
Putnam	TN	200.4
Blount	AL	200.3
Chickasaw	MS	199.1
Fannin	GA	198.8
Grayson	VA	198.7
De kalb	AL	198.5
Preston	WV	197.9
Wayne	WV	197.5
Pickens	GA	197.4
Rabun	GA	197.3
Tippah	MS	197.2
Cannon	TN	196.9
Dade	GA	193.4
Wythe	VA	193.1
Wilkes	NC	192.8
Green	KY	192.8
Greene	TN	192.6
Randolph	WV	191.3
Upshur	WV	191.3
Monroe	MS	191.2
Lewis	WV	190.6
Sevier	TN	190.4
Alleghany	NC	190.2
Gallia	OH	190.0
Lumpkin	GA	189.2
Alcorn	MS	189.1
Shelby	AL	188.9
Limestone	AL	188.8
Stokes	NC	188.1
Paulding	GA	187.9
Garrett	MD	186.4
Elmore	AL	186.3

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)		
County	State	Index
Indiana	PA	137.74
Snyder	PA	137.46
Jefferson	TN	137.40
Sequatchie	TN	137.29
Chilton	AL	137.14
Macon	TN	136.76
Cattaraugus	NY	136.69
Clarion	PA	136.65
Calhoun	AL	136.37
Crawford	PA	136.06
Rabun	GA	136.03
Colbert	AL	135.89
Clay	TN	135.80
Fulton	PA	135.72
Mitchell	NC	135.49
Brooke	WV	135.38
Clay	AL	135.30
Cherokee	AL	135.15
Cabell	WV	135.02
Monroe	MS	134.96
Wise	VA	134.90
Carter	TN	134.26
Warren	TN	134.14
Tioga	PA	133.72
Jefferson	PA	133.63
Columbiana	OH	133.54
Fayette	AL	133.48
Beaver	PA	133.33
Tazewell	VA	133.10
Coosa	AL	132.73
De Kalb	TN	132.65
Schuyler	NY	132.50
Hardy	WV	132.06
Chambers	AL	132.00
Ashe	NC	131.55
Madison	NC	131.31
Greene	TN	131.26
McKean	PA	130.90
Ross	OH	130.65
Brown	OH	130.64
Heard	GA	130.52
Lackawanna	PA	130.48
Laurel	KY	130.41
Itawamba	MS	130.11
Mercer	PA	129.98
Franklin	TN	129.89
Garrard	KY	129.44
Juniata	PA	129.31

PICKARD INDEX		
County	State	Index
Cherokee	SC	185.4
Clay	MS	185.4
Warren	TN	185.4
Bath	VA	184.5
Pike	OH	183.8
Washington	VA	182.3
Smyth	VA	182.1
Taylor	WV	181.6
Greenbrier	WV	181.5
Forsyth	GA	181.2
Meigs	OH	181.1
Oktibbeha	MS	180.9
Bartow	GA	180.1
McDowell	NC	180.1
Carter	TN	180.1
Tyler	WV	179.8
Garrard	KY	179.5
Mason	WV	179.5
Oconee	SC	179.3
Unicoi	TN	179.3
Craig	VA	178.3
Ritchie	WV	177.6
Jackson	GA	177.5
Watauga	NC	177.3
Cherokee	GA	176.8
Polk	GA	175.9
Gordon	GA	175.2
Haralson	GA	174.6
Carroll	GA	174.5
Douglas	GA	173.6
Jefferson	TN	173.1
Mercer	WV	172.8
Talladega	AL	172.8
Greenup	KY	171.4
Chattooga	GA	171.1
Monroe	OH	170.8
Alleghany	VA	170.8
Madison	KY	170.7
McMinn	TN	170.6
Tallapoosa	AL	169.7
Fayette	PA	169.6
Polk	NC	169.2
Tuscaloosa	AL	169.1
Alexander	NC	167.7
Barrow	GA	167.5
Chambers	AL	167.4
Marshall	AL	166.9
Noble	OH	166.5

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Greenup	KY	129.10
Marshall	AL	129.10
Muskingum	OH	129.05
Lamar	AL	129.02
McMinn	TN	128.32
Cullman	AL	128.28
Gilmer	GA	128.20
Hancock	WV	128.07
Macon	NC	127.94
Haralson	GA	127.88
Avery	NC	127.88
De kalb	AL	127.83
Delaware	NY	127.55
Oktibbeha	MS	127.39
Franklin	GA	126.93
Columbia	PA	126.75
Sevier	TN	126.32
Elmore	AL	126.30
Cleburne	AL	126.01
Wayne	PA	126.00
Lauderdale	AL	125.92
Schoharie	NY	125.86
Washington	PA	125.83
Coshocton	OH	125.33
Carroll	OH	125.16
Smyth	VA	124.63
Chautauqua	NY	124.52
Hamblen	TN	124.36
Pontotoc	MS	124.31
Lycoming	PA	124.19
Stephens	GA	124.17
Highland	VA	124.07
Walker	GA	123.77
Dade	GA	123.76
Blount	AL	123.67
Roane	TN	123.63
Tallapoosa	AL	123.63
Scott	VA	123.60
Hawkins	TN	123.50
Jackson	NC	123.36
Boyd	KY	123.28
Union	MS	123.13
Alleghany	VA	122.80
Bradford	PA	122.48
Wood	WV	122.46
Chemung	NY	122.37
Tuscarawas	OH	122.25
Alleghany	NC	122.13

PICKARD INDEX

County	State	Index
Franklin	TN	166.4
Pleasants	WV	166.1
Pulaski	VA	165.3
Rutherford	NC	165.2
Jackson	WV	164.5
Montgomery	KY	164.1
Fulton	PA	163.8
Washington	TN	163.7
Jackson	OH	163.3
Loudon	TN	163.3
Roane	TN	161.9
Giles	VA	160.8
Greene	PA	160.4
Somerset	PA	159.9
Scioto	OH	159.8
Putnam	WV	159.6
Surry	NC	159.3
Brown	OH	159.2
Botetourt	VA	159.2
Huntingdon	PA	159.0
Lee	MS	158.3
Stephens	GA	158.2
Marshall	WV	158.1
Davie	NC	158.0
Yadkin	NC	157.3
Etowah	AL	157.1
Jefferson	WV	156.6
Lowndes	MS	155.4
Burke	NC	154.9
Bradley	TN	154.7
Whitfield	GA	154.5
Guernsey	OH	154.0
Hall	GA	153.9
Berkeley	WV	153.8
Hamblen	TN	153.6
Morgan	OH	153.5
Habersham	GA	153.4
Hocking	OH	153.1
Highland	OH	152.8
Lawrence	OH	152.7
Caldwell	NC	151.4
Gwinnett	GA	150.9
Bedford	PA	150.6
Calhoun	MS	150.0
Perry	OH	149.4
Spartanburg	SC	149.1
Athens	OH	149.0
Transylvania	NC	148.7

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Berkeley	WV	122.01
Union	PA	121.89
Montour	PA	121.52
Washington	OH	121.39
Susquehanna	PA	121.28
St. Clair	AL	121.07
Westmoreland	PA	120.96
Steuben	NY	120.93
Cortland	NY	120.78
Ohio	WV	120.63
Putnam	WV	120.15
Putnam	TN	119.67
Haywood	NC	119.22
Wyoming	PA	119.12
Chenango	NY	118.82
Lowndes	MS	118.76
McDowell	NC	118.51
Bland	VA	118.03
Smith	TN	117.98
Monongalia	WV	117.64
Kanawha	WV	117.47
Grayson	VA	117.30
Giles	VA	117.25
Pulaski	VA	116.23
Carroll	VA	116.23
Tuscaloosa	AL	116.22
Morgan	AL	116.09
Loudon	TN	116.00
Otsego	NY	115.80
Warren	PA	115.72
Erie	PA	115.43
Pickens	GA	114.95
Rutherford	NC	114.89
Elk	PA	114.11
Washington	MD	113.72
Madison	GA	113.54
Madison	KY	113.53
Butler	PA	113.17
Limestone	AL	113.16
Oconee	SC	112.58
Wythe	VA	111.88
Jefferson	WV	111.75
Floyd	GA	111.40
Coffee	TN	111.16
Bartow	GA	110.79
Cherokee	SC	110.57
Barrow	GA	110.34
Blount	TN	110.00

PICKARD INDEX

County	State	Index
Clearfield	PA	148.2
Clark	KY	148.0
Ross	OH	146.2
Anderson	SC	145.6
Mineral	WV	144.7
Forest	PA	144.5
Juniata	PA	144.1
Indiana	PA	143.4
Wetzel	WV	143.3
Sullivan	PA	142.1
Holmes	OH	141.9
Coffee	TN	141.8
Lauderdale	AL	141.1
Calhóun	AL	141.0
Morgan	AL	140.8
Floyd	GA	140.7
Schuylkill	PA	140.4
Walker	GA	139.5
Blount	TN	138.4
Snyder	PA	138.3
Monongalia	WV	137.7
Montour	PA	137.4
Pickens	SC	136.6
Colbert	AL	136.3
Wayne	PA	135.4
Armstrong	PA	134.8
Belmont	OH	134.5
Columbiana	OH	133.0
Potter	PA	132.9
Union	PA	132.4
Cambria	PA	132.3
Carbon	PA	131.5
Schoharie	NY	131.4
Haywood	NC	131.2
Harrison	OH	130.6
Jefferson	PA	130.3
Washington	MD	126.9
Luzerne	PA	125.9
Jefferson	AL	125.3
Henderson	NC	125.0
Wyoming	PA	124.6
Harrison	WV	124.4
Buncombe	NC	124.3
Clarion	PA	124.2
Susquehanna	PA	123.5
Perry	PA	123.0
Northumberland	PA	122.7
Sullivan	TN	122.7

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Washington	TN	109.93
Anderson	SC	109.50
Jackson	GA	109.48
Carroll	GA	109.17
Bath	VA	109.04
White	GA	108.96
Holmes	OH	108.92
Habersham	GA	108.73
Gordon	GA	108.54
Clark	KY	107.84
Lee	MS	107.79
Murray	GA	107.42
Dawson	GA	107.35
Floyd	VA	107.22
Surry	NC	107.20
Monroe	PA	106.87
Perry	PA	106.80
Jefferson	AL	106.47
Transylvania	NC	106.43
Craig	VA	106.20
Lumpkin	GA	105.73
Anderson	TN	105.61
Bradley	TN	104.74
Catoosa	GA	103.81
Centre	PA	103.42
Watauga	NC	102.91
Broome	NY	102.80
Allegheny	PA	102.74
Pike	PA	102.59
Sullivan	TN	102.43
Washington	VA	101.92
Henderson	NC	101.81
Tioga	NY	101.49
Clermont	OH	101.34
Pickens	SC	101.28
Banks	GA	100.84
Spartanburg	SC	100.51
Hamilton	TN	99.81
Buncombe	NC	99.47
Caldwell	NC	99.41
Burke	NC	99.22
Paulding	GA	98.57
Wilkes	NC	97.97
Yadkin	NC	97.52
Polk	NC	97.09
Madison	AL	96.29
Knox	TN	95.48
Hall	GA	94.18

PICKARD INDEX

County	State	Index
Knox	TN	122.5
Catoosa	GA	121.8
Washington	OH	120.5
Boyd	KY	119.7
Muskingum	OH	119.5
Marion	WV	119.3
Allegany	MD	117.7
Hamilton	TN	117.6
Cabell	WV	116.8
Mifflin	PA	115.5
Carroll	OH	114.9
Greenville	SC	114.9
Pike	PA	114.5
Lackawanna	PA	113.7
Venango	PA	113.4
Blair	PA	112.5
Washington	PA	112.2
Coshocton	OH	110.6
Kanawha	WV	109.6
Elk	PA	109.2
Delaware	NY	108.0
Madison	AL	106.2
Allegany	NY	105.3
Westmoreland	PA	105.1
Schuyler	NY	103.6
Anderson	TN	103.6
Jefferson	OH	103.0
Clinton	PA	102.8
Otsego	NY	102.4
Ohio	WV	102.2
Columbia	PA	102.1
Tioga	PA	101.9
Cattaraugus	NY	101.8
Crawford	PA	101.5
Tuscarawas	OH	101.5
Wood	WV	101.5
Steuben	NY	100.7
Warren	PA	100.7
Bradford	PA	99.2
Clermont	OH	98.9
Lycoming	PA	96.7
Brooke	WV	96.6
Lawrence	PA	96.3
Forsyth	NC	96.3
McKean	PA	96.2
Centre	PA	94.5
Monroe	PA	93.4
Chautauqua	NY	92.1

Appendix B. Comparison of Rank-ordered Indicies (cont.)

PENN STATE INDEX (mean 1980-1994)

County	State	Index
Stokes	NC	93.25
Whitfield	GA	91.96
Alexander	NC	91.79
Tompkins	NY	90.81
Greenville	SC	90.11
Davie	NC	88.72
Shelby	AL	88.24
Douglas	GA	86.59
Botetourt	VA	83.46
Cherokee	GA	79.94
Forsyth	NC	79.84
Forsyth	GA	76.69
Gwinnett	GA	67.92

PICKARD INDEX

County	State	Index
Chenango	NY	90.9
Butler	PA	90.7
Cortland	NY	88.6
Beaver	PA	86.7
Erie	PA	86.4
Tioga	NY	86.2
Allegheny	PA	85.1
Chemung	NY	83.8
Mercer	PA	83.2
Hancock	WV	81.6
Cameron	PA	73.5
Broome	NY	71.3
Tompkins	NY	65.8

Appendix C. Alternative Index Specification

Alternative Index Specification. In our index, four separate measures of economic health are used to obtain a single, average measure of county-level economic health in comparison with national levels. While each of the four measures is highly related, each also was designed to capture a slightly different facet of economic status.

Index Calibration. Each of the four individual indices are scaled such that a county-level value equal to the national average yields an index score of 100. Scores $>$ 100 reflect a county situation that is *worse* than national averages (e.g., lower per-capita market income or higher unemployment rates). Therefore, for a given year, a county that was at national averages across the four individual measures would have an overall index of 100; counties that are "better-off" than the national average would have a score $<$ 100; and counties "worse-off" than national averages would have an overall index $>$ 100.

In equation form, the yearly overall county-level index can be summarized as follows:

$$IDX_j = \frac{PCMI_{idx_j} + URT_{idx_j} + LFPOP_{idx_j} + TFP_{idx_j}}{4}$$

where IDX_j = county-level index in year j. Below, the rationale for using each of the four measures and their specific calculation is reviewed.

The Individual Measures. The first county-level measure utilized, per-capita market income in relation with U.S. averages ($PCMI_{idx}$), is a direct measure of income and is simply an extension of the ARC's traditional use of market earnings. Market income is defined as

income earned from wages, dividends, and rent, adjusted for residence and exclusive of transfer payments. The county-level index in year j is calculated as follows:

$$PCMI_{idx_{cj}} = \frac{100}{1 - \left[(PCMI_{uj} - PCMI_{cj}) / PCMI_{uj} \right]}$$

where $PCMI_{uj}$ = U.S. per-capita market income in year j and $PCMI_{cj}$ = county per-capita market income in year j. Counties with lower per-capita market income in comparison with national levels will have an index score > 100 on this measure.

The second individual county index is again an extension of a traditional ARC measure: the unemployment rate in comparison with national averages. The derivation of the index is as follows:

$$URT_{idx_{cj}} = \frac{100URT_{cj}}{URT_{uj}}$$

where URT_{cj} = county unemployment rate in year j and URT_{uj} = U.S. unemployment rate in year j. Counties with unemployment levels greater than the national average will have an index score > 100 on this measure.

The third county-level index reflects the number of persons in the labor force in comparison with the total population. This measure is defined to capture the "dependent" population of a county. As the relative number of (for example) children, non-working mothers, elderly, discouraged workers, and other non- (or low-) wage-earning persons increases for a given population, the further the wage earners' incomes will be stretched.

Concurrently, it can be hypothesized that in situations where there is a relatively small labor force in comparison with population levels, there will be a greater overall dependence on government supports in the form of transfer payments of differing types. The county-level labor force/population ratio index for county c in year j is calculated as follows:

$$LFPOP_{idx_{cj}} = \frac{100}{1 - \left[(LFPOP_{uj} - LFPOP_{cj}) / LFPOP_{uj} \right]}$$

where $LFPOP_{cj}$ = county labor force divided by total county population in county c in year j; and, $LFPOP_{uj}$ = U.S. labor force divided by U.S. population in year j. As the labor force to population ratio gets smaller relative to the nation's average, the index becomes larger.

The final individual measure of county-level economic health is the ratio of per-capita transfer payment income to per-capita earned income. This measure assumes that transfer payments are made largely to those individuals and entities that do not generate self-sustaining levels of income. The index is calculated as follows:

$$TFP_{idx_{cj}} = \frac{100 \left[PCTP_{cj} / PCMI_{cj} \right]}{\left[PCTP_{uj} / PCMI_{uj} \right]}$$

where $PCTP_{cj}$ = county per-capita transfer payments in year j; $PCMI_{cj}$ = county per-capita market income in year j; $PCTP_{uj}$ = USA per-capita transfer payments in year j; and $PCMI_{uj}$ = USA per-capita market income in year j. As the ratio of transfer payments to earned income becomes larger than the national average, the value of the index becomes > 100.

The combined index score is simply calculated as the mean of the four individual indices as described above. As a reminder to the reader, a score $>$ 100 indicates a county has poor economic health relative to national averages; conversely, a score $<$ 100 reflects better economic health in a county.

Appendix D. Evaluation of the Combined Score Index

An important consideration in the development of the combined index is the extent to which the four components (i.e., the four individual indices) are measuring the "same thing." That is, the combined scale only has meaning to the extent that the combination of the four individual indices actually measure the construct of interest, in this case, economic health. To assess the adequacy of the scale, standardized alpha reliability coefficients were calculated for each year. The coefficient is calculated as follows (Norusis, 1997: 108; Nunnally, 1967: 223):

$$\alpha = \frac{n\bar{r}}{1+(n-1)n\bar{r}}$$

where n = the number of individual items summed to form the index and r = the average correlation coefficient between items.

The maximum possible value for the coefficient is 1, indicating the highest reliability. Reliability scores for the economic health index are listed below. In no year does the reliability fall below 0.081, and the average over the 15-year time period is 0.873. Overall, the scale exhibits high reliability throughout the study period.

Combined Index Reliability Scores

Year	Standardized Alpha
1980	0.836
1981	0.825
1982	0.812
1983	0.855
1984	0.859
1985	0.881
1986	0.883
1988	0.909
1989	0.893
1990	0.894
1991	0.896
1992	0.894
1993	0.894
1994	0.882
1995	0.888

Source: Authors' calculations on index components. See text for details.

To further confirm that the four county-level measures could appropriately be combined into one "dimension" and to confirm that no other relevant dimensions in the data were present, an eigen-analysis of the four individual measures on a yearly basis was conducted. The tests indicate that a single dimension (i.e., the combined index) accounts for an average of 73.07% of the variance across the four measures. In no year does a second

eigenvalue $>$ 1.0 appear (the common cutoff value for a "relevant" dimension). In sum, both the reliability analysis and the eigenvalue analysis indicate that the four individual measures can appropriately be combined into a single measure of county-level status.

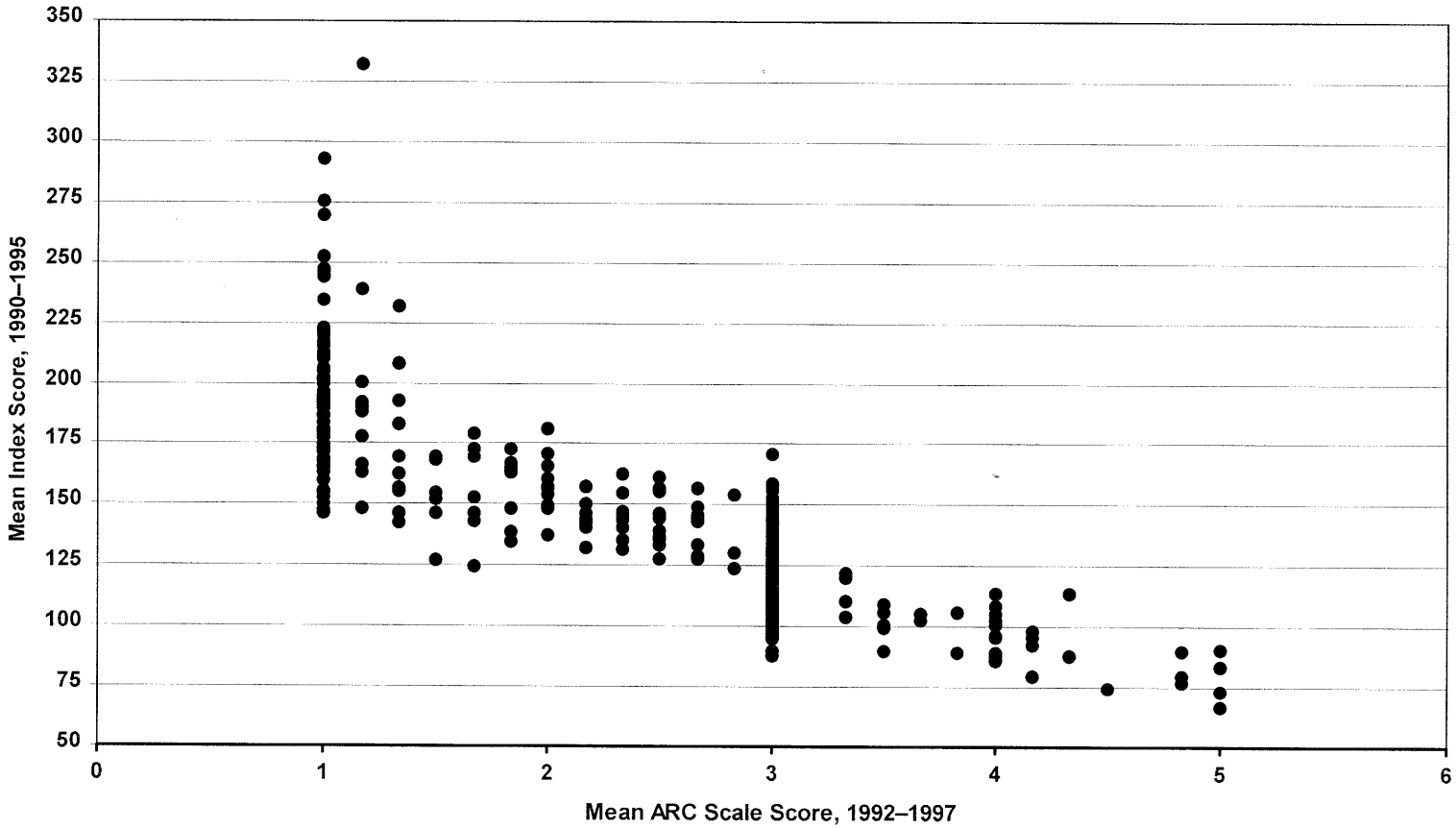
Appendix E. Index Volatility

Each of the indicators of economic health that are combined to form the yearly index have different levels of year-to-year volatility. To assess this volatility, we calculated the standard deviation of each measure over the study period (1980–1995). The results were as follows:

Economic Health Measure	**SD**
Unemployment	27.16
Transfer payments/market income	12.90
Market income	9.22
Labor force/population ratio	8.33
COMBINED INDEX	**10.63**

As the table shows, the volatility of the unemployment measure is extreme. However, our method of combining measures of economic health into a single index does a relatively good job of smoothing out these deviations, at least to some extent.

Appendix F. Comparison Between ARC Designation and the Index of Economic Health



Source: Authors' calculations on index scores and ARC data. See text for details.

Appendix G. Counties with Index Changes > 10%

FIPS	County	State	Index Average: 1980-1985	Index Average: 1990-1995	Change Percentage	"Direction" of Change
51091	Highland	VA	144.61	98.45	-.3192	Positive
1117	Shelby	AL	103.31	72.43	-.2989	Positive
47087	Jackson	TN	194.76	145.41	-.2534	Positive
13085	Dawson	GA	116.24	87.94	-.2435	Positive
42023	Cameron	PA	170.96	130.09	-.2391	Positive
47137	Pickett	TN	187.75	144.37	-.2310	Positive
13291	Union	GA	165.51	127.69	-.2285	Positive
54071	Pendleton	WV	168.50	131.04	-.2223	Positive
1009	Blount	AL	137.50	107.08	-.2212	Positive
47175	Van Buren	TN	195.09	153.32	-.2141	Positive
54031	Hardy	WV	141.77	114.47	-.1926	Positive
47015	Cannon	TN	152.40	124.31	-.1843	Positive
47141	Putnam	TN	132.77	108.65	-.1817	Positive
13311	White	GA	120.57	99.30	-.1765	Positive
21137	Lincoln	KY	175.47	144.90	-.1742	Positive
1007	Bibb	AL	175.43	145.76	-.1691	Positive
1043	Cullman	AL	139.80	116.22	-.1687	Positive
47063	Hamblen	TN	137.00	114.02	-.1677	Positive
1133	Winston	AL	160.58	133.71	-.1673	Positive
47049	Fentress	TN	204.25	170.72	-.1642	Positive
1079	Lawrence	AL	149.67	125.53	-.1613	Positive
13187	Lumpkin	GA	117.34	98.55	-.1602	Positive
51045	Craig	VA	115.78	97.30	-.1596	Positive
37189	Watauga	NC	111.84	94.40	-.1560	Positive
1073	Jefferso	AL	115.32	97.35	-.1558	Positive
42027	Centre	PA	111.57	94.32	-.1546	Positive
47041	De Kalb	TN	143.72	121.72	-.1531	Positive
1077	Lauderdale	AL	134.16	113.99	-.1503	Positive
47093	Knox	TN	102.00	86.89	-.1481	Positive
37043	Clay	NC	172.56	147.22	-.1468	Positive
54037	Jefferson	WV	124.43	106.17	-.1467	Positive
47051	Franklin	TN	141.23	120.60	-.1461	Positive
1103	Morgan	AL	125.51	107.22	-.1457	Positive
21207	Russell	KY	198.25	169.38	-.1456	Positive
47155	Sevier	TN	132.51	113.34	-.1447	Positive
47105	Loudon	TN	122.91	105.14	-.1446	Positive
37059	Davie	NC	96.32	82.66	-.1417	Positive
1029	Cleburne	AL	133.09	114.24	-.1416	Positive
1107	Pickens	AL	184.81	158.87	-.1404	Positive
47133	Overton	TN	181.44	156.50	-.1375	Positive
37149	Polk	NC	104.49	90.51	-.1338	Positive
1115	St. Clair	AL	127.60	110.56	-.1335	Positive
1071	Jackson	AL	147.32	127.79	-.1326	Positive
1083	Limestone	AL	123.67	107.32	-.1322	Positive
42093	Montour	PA	130.77	113.66	-.1309	Positive
1033	Colbert	AL	141.16	122.79	-.1301	Positive
42019	Butler	PA	121.54	106.11	-.1269	Positive
47011	Bradley	TN	113.06	98.80	-.1261	Positive
28057	Itawamba	MS	134.67	118.15	-.1227	Positive

Appendix G. Counties with Index Changes > 10% (cont.)

FIPS	County	State	Index Average: 1980-1985	Index Average: 1990-1995	Change Percentage	"Direction" of Change
47029	Cocke	TN	188.60	165.51	-.1224	Positive
21165	Menifee	KY	229.84	201.94	-.1214	Positive
13055	Chattooga	GA	142.36	125.45	-.1188	Positive
1093	Marion	AL	155.21	136.92	-.1178	Positive
28069	Kemper	MS	188.34	166.22	-.1174	Positive
37011	Avery	NC	140.19	123.74	-.1173	Positive
47111	Macon	TN	144.04	127.29	-.1163	Positive
1125	Tuscaloosa	AL	123.54	109.21	-.1160	Positive
1089	Madison	AL	103.76	91.81	-.1152	Positive
13139	Hall	GA	99.01	87.73	-.1140	Positive
37009	Ashe	NC	144.88	128.50	-.1130	Positive
13281	Towns	GA	161.93	143.79	-.1120	Positive
1111	Randolph	AL	161.37	143.31	-.1119	Positive
28081	Lee	MS	111.09	98.75	-.1111	Positive
39025	Clermont	OH	106.67	95.04	-.1090	Positive
47123	Monroe	TN	164.00	146.14	-.1089	Positive
47179	Washington	TN	115.37	102.84	-.1086	Positive
37171	Surry	NC	115.40	102.90	-.1083	Positive
47057	Grainger	TN	160.92	143.92	-.1056	Positive
13137	Habersham	GA	113.45	101.66	-.1039	Positive
45073	Oconee	SC	122.93	110.32	-.1026	Positive
13313	Whitfield	GA	96.77	86.90	-.1021	Positive
21171	Monroe	KY	157.46	141.54	-.1011	Positive
47035	Cumberland	TN	163.55	147.13	-.1004	Positive
54067	Nicholas	WV	175.13	192.95	.1018	Negative
54023	Grant	WV	131.91	145.43	.1025	Negative
24001	Allegany	MD	141.08	156.01	.1059	Negative
13143	Haralson	GA	121.81	134.76	.1063	Negative
54077	Preston	WV	153.46	169.83	.1067	Negative
1057	Fayette	AL	119.73	132.56	.1071	Negative
21121	Knox	KY	173.45	192.06	.1073	Negative
37175	Transylvania	NC	101.99	113.07	.1087	Negative
47061	Grundy	TN	170.99	190.47	.1139	Negative
39131	Pike	OH	157.54	175.69	.1152	Negative
37075	Graham	NC	167.40	187.30	.1189	Negative
54109	Wyoming	WV	197.53	221.30	.1203	Negative
21135	Lewis	KY	174.48	195.64	.1213	Negative
28025	Clay	MS	131.45	147.54	.1224	Negative
42127	Wayne	PA	123.50	138.91	.1248	Negative
47091	Johnson	TN	174.80	196.63	.1249	Negative
54083	Randolph	WV	156.02	175.62	.1257	Negative
51169	Scott	VA	116.61	131.29	.1259	Negative
54095	Tyler	WV	138.81	156.33	.1263	Negative
28155	Webster	MS	141.05	159.61	.1316	Negative
21065	Estill	KY	169.88	192.61	.1338	Negative
21237	Wolfe	KY	213.46	242.79	.1374	Negative
42121	Venango	PA	141.45	161.11	.1390	Negative
54073	Pleasant	WV	143.42	163.42	.1394	Negative

Appendix G. Counties with Index Changes > 10% (cont.)

FIPS	County	State	Index Average: 1980-1985	Index Average: 1990-1995	Change Percentage	"Direction" of Change
54041	Lewis	WV	157.53	179.80	.1413	Negative
54049	Marion	WV	143.46	164.79	.1487	Negative
51185	Tazewell	VA	123.79	142.21	.1488	Negative
21189	Owsley	KY	286.59	332.49	.1602	Negative
21115	Johnson	KY	141.90	165.61	.1671	Negative
54103	Wetzel	WV	141.70	165.52	.1681	Negative
54045	Logan	WV	175.27	205.63	.1732	Negative
47143	Rhea	TN	133.73	156.90	.1733	Negative
21071	Floyd	KY	161.46	189.66	.1746	Negative
39053	Gallia	OH	139.82	165.49	.1836	Negative
13149	Heard	GA	117.28	139.03	.1854	Negative
21195	Pike	KY	132.27	157.10	.1877	Negative
28019	Choctaw	MS	141.93	169.27	.1926	Negative
54075	Pocahontas	WV	167.41	201.13	.2014	Negative
21013	Bell	KY	170.95	205.84	.2041	Negative
21175	Morgan	KY	181.54	218.69	.2046	Negative
54021	Gilmer	WV	157.52	191.58	.2162	Negative
39163	Vinton	OH	149.16	181.52	.2170	Negative
39115	Morgan	OH	135.84	165.34	.2172	Negative
21087	Green	KY	123.33	151.67	.2298	Negative
21051	Clay	KY	178.52	221.63	.2415	Negative
51017	Bath	VA	86.57	108.15	.2493	Negative
54047	McDowell	WV	233.04	293.69	.2603	Negative
21095	Harlan	KY	180.16	228.41	.2678	Negative
39105	Meigs	OH	144.94	184.76	.2747	Negative
21063	Elliott	KY	184.31	235.78	.2793	Negative
54097	Upshur	WV	137.05	175.81	.2828	Negative
54005	Boone	WV	140.99	181.47	.2871	Negative
21193	Perry	KY	139.00	180.45	.2982	Negative
21057	Cumberland	KY	160.85	209.98	.3054	Negative
54001	Barbour	WV	164.23	217.10	.3219	Negative
51051	Dickenson	VA	135.37	180.13	.3306	Negative
51027	Buchanan	VA	117.64	161.03	.3689	Negative
21025	Breathit	KY	159.30	225.22	.4138	Negative
51195	Wise	VA	109.01	156.55	.4362	Negative
21153	Magoffin	KY	170.92	252.15	.4752	Negative
21159	Martin	KY	103.68	187.25	.8059	Negative

Appendix H. Logistic Analysis of ARC Distressed Designation Binary Dependent Variable

Logistic Regression Analysis*		
Variable	**Standardized Coefficient**	**Likelihood Ratio Significance**
Percentage of population with BS degree	-0.412	0.000
Percentage population female, single, with children < 17 years	0.256	0.000
County location: metropolitan area	-0.232	0.000
Female labor force as percentage of total	-0.207	0.000
Percentage of income from government sector	0.199	0.000
County location: adjacent to metropolitan area	-0.118	0.002
County location: "central" ARC subregion	0.101	0.025
Percentage of income from manufacturing sector	-0.076	0.058
County location: along the "edge" of the ARC region	-0.064	0.067
Percentage of income from the services sector	-0.091	0.185
Percentage of population aged 65+	0.058	0.203
County location: "southern" ARC subregion	0.025	0.583
Percentage of establishments < 10 employees	-0.001	0.988
Percentage of income from the retail sector	-0.000	0.992

*Dependent variable: mean distress scores were calculated based upon the ARC's 5-category county rating system for the years 1992–1997 (1 = worst; 5 = best). Mean scores were dichotomized as follows: scores < 3 = "distressed / high risk" (coded 1); scores ≥3 = "healthy" (coded 0).

N = 387 due to missing values on source of income variables for several counties.

Summary Statistics:

Model Fit
-2LL initial: 524.838
-2LL final: 225.948
Model chi-square: 298.889 (p = 0.000)
R^2_L = 0.570
R^2 = 0.626

Prediction Rates
Nondistressed: 89.87%
Distressed: 84.38%
Overall: 87.60%

Appendix I. Change in Index Scores (mean 1991–1995 versus mean 1980–1984)

Step 1: Calculation of mean and standard deviation of change in distress index

N	Mean change	SD
399	0.1223	18.019

To determine groups that changed by more than one standard deviation

Mean + 18.01989 = 18.142194 and higher changed significantly for the worse (N = 51)

Mean - 18.01989 = -17.89786 and lower changed significantly for the better (N = 44)

Henceforth: Group that changed for the better: POSCHG

Group that changed for the worse: NEGCHG

To see if the counties started and ended at the same place we conducted two analysis of variance tests comparing the mean index score for the POSCHG counties and the NEGCHG counties for the beginning period (1980–1984) and the end period (1991–1995).

	NEGCHG	POSCHG	ANOVA p value
Mean index 1980–1984	157.08	156.14	0.809
Mean index 1991–1995	190.65	129.76	0.000

This indicates that there was no difference between these counties at the beginning of the period, but divergence occurred during the period.

Statistical tests between groups

Step II: Crosstabulations of county characteristic and change in index (expected values in parentheses).

Adjacency to the Edge of the Region			
	NEGCHG	**POSCHG**	**TOTAL**
Not Adjacent	44 (38.7)	28 (33.3)	72
Adjacent	7 (12.3)	16 (10.7)	23
TOTAL	51	44	95
chi-square p = 0.010			

We then compared change in economic health score among counties with county characteristics that have been identified as important predictors of distressed status. The second table indicates that counties experiencing a negative change in health were more likely than predicted not to be adjacent to urban areas. The reverse was true for counties that improved their status over the study period.

A third evaluation of characteristics distinguishing among major changes, positive and negative, was metro status. Table 4 suggests that nonmetro counties were more likely than expected to be associated with negative change. Fewer nonmetro counties than expected also showed positive change. These results suggest there is a significant negative effect of being a nonmetro county.

Metropolitan Versus Nonmetropolitan Status			
	NEGCHG	**POSCHG**	**TOTAL**
Not metro	51 (46.2)	35 (39.8)	86
Metro	0 (4.8)	9 (4.2)	9
TOTAL	51	44	95
chi-square p = 0.001			
Fisher's p = 0.001 (used when there are expected cell values below 5)			

The fourth evaluation of counties examined levels of change and location in one of the ARC's three subregions. The results suggest the following. Negative changes are overrepresented in the north and central parts of the region compared with the south. Conversely, southern counties were overrepresented in the positive change category given their presence in the entire group of distressed counties.

Subregion			
	NEGCHG	**POSCHG**	**TOTAL**
North	17 (11.3)	4 (9.7)	21
Central	26 (19.9)	11 (17.1)	37
South	8 (19.9)	29 (17.1)	37
TOTAL	51	44	95
chi-square p = 0.000			

Variable	Mean_ NEGCHG	Mean_ POSCHG	ANOVA p value
BS degree	0.033	0.044	0.004
Females with children < 17	0.035	0.032	0.245
Percent establishments < 10 employees	0.794	0.796	0.874
Percent income residential adjustment	0.039	0.161	0.000
Percent income retail	0.057	0.587	0.675
Percent income services	0.099	0.085	0.191
Percent income government	0.109	0.088	0.002
Percent income manufacturing	0.086	0.169	0.000
Percent population 65+	0.139	0.146	0.178
Labor force—percent female	0.410	0.443	0.000

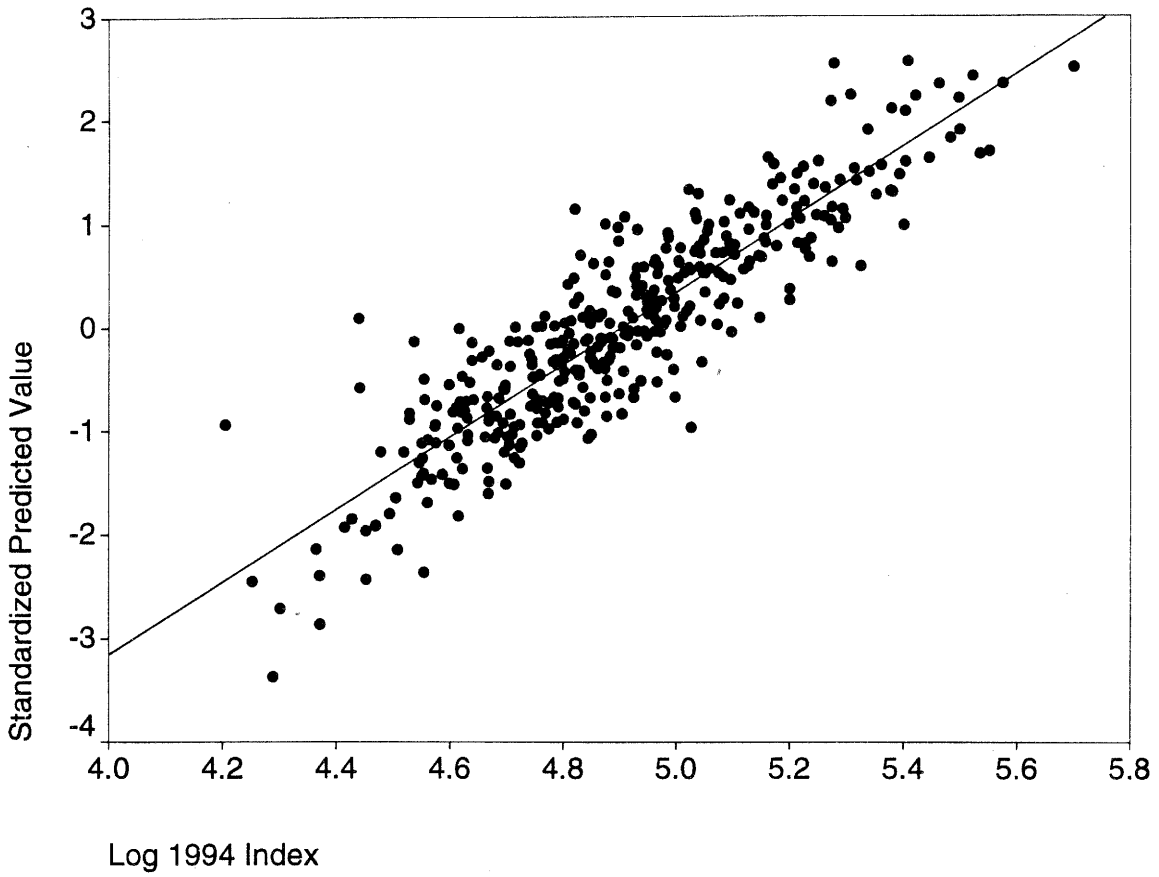
Appendix J. Regression Diagnostics

Overall, the regression model performed very well. A chart plotting actual and predicted values (following page) graphically illustrates the high levels of association indicated by the R^2 value of 0.797.

All independent variables were examined for possible collinearity problems through the calculation of variance inflation factors. In no instance was there a factor greater than 2.30, indicating no problems on this front.

Overall, the number of cases for which there is a "bad fit" is relatively small. An analysis of residuals indicated that only 15 of 387 cases (3.9%) had standardized residuals greater than $|2|$, although two counties had standardized residuals greater than $|4|$. A chart (also shown below) plotting standardized predicted and standardized residual values reveals no relationship, indicating that heteroscedacticity is not a problem in the model.

Actual and Predicted Values



Residual Analysis