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ABSTRACT

This report analyzes changes in the number of distressed counties in Appalachia since 1960, identifies macroeconomic trends associated with distress in Appalachia, and examines socioeconomic factors associated with long-term distress as well as factors that predict whether a county moved out of distress. These data are also compared with similar data for the rest of the United States. The number of distressed Appalachian counties declined from 214 in 1960 to 78 in 1980, then rose to 106 in 1990. These trends mirror national trends. Full-employment policies and the initiation of large-scale federal poverty alleviation and economic development programs set the stage for major reductions in national distress levels. The shift toward anti-inflation policies and away from full-employment policies, and the long-term rise in household income and wage inequality were associated with rising distress levels nationally and regionally since the 1980s. Within Appalachia, factors associated with movement out of distressed status include a higher share of manufacturing employment, becoming part of a metropolitan area, more diversified economy, higher educational attainment, higher percentages of people living in urban areas, and ability to attract retirees as residents. Factors associated with persistent distress include higher shares of mining employment, minority populations, and children and elderly dependent populations, and dependence on government transfer payments. Policy implications are discussed. Appendices present distressed counties by year, maps, research methodology, and information about study data. (Contains 66 references.) (TD)

Progress and Challenges in Reducing Economic Distress in Appalachia
An Analysis of National and Regional Trends Since 1960

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Executive Summary

Progress and Challenges in Reducing Economic Distress in Appalachia: An Analysis of National and Regional Trends Since 1960

This report presents an analysis of the changes in the number of distressed counties in Appalachia and the entire United States for the census years 1960, 1970, 1980, and 1990 based on the Appalachian Regional Commission's (ARC) current distress measure. Distressed counties are those with poverty and unemployment rates one and a half times the national rates and with per capita incomes that are two-thirds or less than the national rate. The findings fill a critical gap in the research on Appalachia by identifying the number of distressed counties in Appalachia prior to the inception of the ARC, as well as throughout much of the ARC's existence. Furthermore, by determining the total number of distressed counties in the entire United States, this research provides a benchmark for socioeconomic conditions in Appalachia relative to the rest of the nation.

Second, this report identifies macroeconomic and regional trends that are associated with both distress and improvement in Appalachia as well as the entire United States from 1960 to 1990.

Third, this report analyzes the socioeconomic factors that are associated with long-term distress, as well as factors that predict whether a county moved out of distress in the region.

Key Findings

The central finding of this analysis is the significant improvement in the Appalachian Region since 1960, as the number of distressed counties in Appalachia has decreased by more than half during the years studied. The number of ARC counties identified as distressed declined sharply from 214 in 1960 to 161 in 1970 and to 78 in 1980. These gains, however, were eroded during the 1980s as the number of distressed counties rose in 1990 to 106. Of the 214 counties that were distressed in 1960, 98 counties remained distressed and 116 were no longer distressed by 1990. The general decline in distressed counties in Appalachia from 1960 to 1980, as well as the rise in the number of distressed counties between 1980 and 1990, clearly mirrors national trends.

This report also finds, however, that approximately one-quarter of the Appalachian counties that were distressed almost four decades ago remain distressed today. Furthermore, while the number of distressed counties in both Appalachia and the United States decreased dramatically between 1960 and 1980, a significant reversal occurred between 1980 and 1990 as the number of distressed counties both nationally and within the Appalachian Region began rising. Thus, an important component of this research is to determine the factors associated with

the number of persistently distressed counties in Appalachia, as well as the rise in distress levels between 1980 and 1990.

The changes in regional and national distress levels can be attributed to several macroeconomic national and international trends, as well as changes in public policies that are largely outside the scope and influence of the ARC. Full employment policies and the initiation of large-scale federal poverty alleviation and economic development programs set the stage for major reductions in national distress levels. The rise in distress levels nationally and regionally were associated with the rising inflation and energy price changes in the mid-1970s and early 1980s, and with corresponding shifts in public policy toward anti-inflation policies and away from full employment policies. These macroeconomic factors had a pronounced effect on manufacturing and extractive industries, which in turn affected the Appalachian economy. Nationally, the long-term rise in household income and wage inequality are other factors associated with rising distress levels since the 1980s.

Within the Appalachian Region, however, the results of the analysis of the region's county-level economies have identified a number of significant factors that are associated with the movement of counties out of distressed status compared with persistently distressed counties:

- A higher share of manufacturing employment, particularly in the South;
- Counties that became part of metropolitan areas, particularly in the South;
- A more diversified economy as reflected by a nonspecialized local economy;
- Higher educational attainment rates for both high school completion and some college;
- A higher percentage of the population living in urban areas (i.e., towns and small cities); and
- The ability of a county to attract retirees to establish residency.

In addition, this research identified several factors that were associated with persistent distressed status as compared with counties that moved out of distress:

- A higher share of mining employment (half of the persistently distressed counties were mining-dependent);
- A higher share of minority populations;
- A higher share of children and elderly dependent populations; and
- A higher dependence on government transfer payments.

Policy Implications

A number of policy issues are raised by these findings. While manufacturing played a generally positive role in the past for reducing distress, the prospects for the future role of manufacturing are decidedly different. Indeed, the outlook is good only for the most productive, capital-intensive manufacturing sectors that are supported by a complex of high technology suppliers, and professional services in such fields as engineering, product design, marketing, and finance.

Another issue is the vulnerability of coal-dependent counties to the fluctuations of energy prices and the demand for coal. The rising distress in the coal-dependent counties points to the need for greater economic diversification efforts to widen the economic base.

Educational attainment is another prominent factor in predicting improvement. Future trends in the knowledge-based economy leave little doubt that educational attainment will continue to be a key factor in improving the prospects for distressed counties. Another important policy issue is the potential role of urbanized centers such as towns and small cities in improving the economic prospects of distressed counties.

The overarching issue that stands out, however, is the fact that so much of the improvement in both Appalachia and the rest of the United States occurred during a period when national policy was supportive of full employment and poverty alleviation efforts. This finding suggests that regional economic development is most likely to take place when national policies create the conditions to support it. As such, addressing persistent distress would seem to require a renewed national commitment, similar to the one that inspired the establishment of the ARC and the regional development policies of the 1960s.

I. Introduction

Since 1965, the Appalachian Regional Commission (ARC) has attempted to improve the socioeconomic conditions in Appalachia. While the ARC originally focused its efforts on developing the more prosperous areas of the Appalachian Region, in the early 1980s the Commission began targeting what it termed "distressed counties" for increased assistance.[1] The ARC's distress indicator compares the socioeconomic status of Appalachian counties with national rates of poverty, unemployment, and per capita income.* The Commission's distress measures are similar to measures used by other federal and state agencies.[2] This report presents, for the first time, an analysis of the changes in the number of distressed counties in Appalachia and the entire United States for the census years 1960, 1970, 1980, and 1990 based on the ARC's current distress measure. This analysis fills a critical gap in the research on Appalachia by identifying the number of distressed counties in Appalachia prior to the inception of the ARC, as well as throughout much of the ARC's existence. Furthermore, by determining the total number of distressed counties in the entire United States, this research provides a benchmark for socioeconomic conditions in Appalachia relative to the rest of the nation, and further affords a means of identifying macro and regional trends that are associated with both distress and improvement in Appalachia as well as the entire United States from 1960 to 1990.

The central finding of this analysis is the significant improvement in the Appalachian Region since 1960, as the number of distressed counties in Appalachia has decreased by more than half during the years studied. This report also finds, however, that approximately one-quarter of the Appalachian counties that were distressed almost four decades ago remain distressed today. Furthermore, while the number of distressed counties in both Appalachia and the United States decreased dramatically between 1960 and 1980, a significant reversal occurred between 1980 and 1990 as the number of distressed counties both nationally and within the Appalachian Region began rising.

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* Distress designations are developed annually by the ARC and are based on county poverty rates and three-year unemployment rates that are 150 percent or more than the national average, and per capita market income (i.e., per capita income less transfer payments) that is two-thirds or less than the national average.

Thus, an important component of this research is to determine the factors associated with the number of persistently distressed counties in Appalachia, as well as the rise in distress levels between 1980 and 1990. Identifying such conditions should prove useful in assessing the effectiveness and broader policy context of the ARC's programs. The results of this research clearly suggest that regional factors, macroeconomic influences, and national policy trends have all influenced county-level distress status in Appalachia. The factors associated with the improvement throughout much of the region, as well as the persistent distressed status of many Appalachian counties, bring into relief a number of policy considerations that the ARC and other government agencies should consider when attempting to improve socioeconomic conditions in Appalachia and elsewhere.

II. Overview of Economic Policies in the Appalachian Region Since 1960

Macroeconomic and Policy Factors Affecting the Appalachian Region

Before discussing the individual policy measures of the ARC, it is important to understand that socioeconomic change in the Appalachian Region is highly sensitive to national policies and macroeconomic factors that are largely beyond the scope of the ARC and other development agencies. A variety of macroeconomic factors especially influence Appalachia. For example, the Appalachian economy has historically been more susceptible to the adverse impacts of recession than other areas of the country, in large part because of a heavy concentration of recession-prone manufacturing and construction-dependent industries in the region.[3] Also, much of Appalachia, especially the coal-producing region of Central Appalachia, is sensitive to energy-related factors. Changing demand for coal from energy-intensive industries as well as price fluctuations for coal and other energy-related resources have profound effects on the Central Appalachian economy.[4] Another macroeconomic factor that has particularly influenced Appalachia's economy over the past few decades includes the growing inequality of income distribution both nationally and regionally.[5] Also, industrial relocation strategies of manufacturing firms have had a major effect on the changes within the region,

resulting in relatively high entry rates of manufacturing plants in both Central and Southern Appalachia, but high exit rates and job loss in the northern part of the region during the 1970s and 1980s. More recently, there has been evidence of a reversal of trends, with higher exit rates of manufacturing establishments in the central and southern parts of the region, particularly in labor-intensive sectors. Plant closures and relocations within the region have increasingly reflected the influence of trade-liberalization policies of recent years.[6]

Policy measures, ranging from broad-scale strategies such as Johnson's "Great Society" programs of the 1960s to individual environmental or international trade regulation policies, have also strongly affected the Appalachian Region. To be sure, the ARC was established during the "Great Society" era, a time when federal government policy measures supported development in distressed regions. The more general concern for social welfare in the 1960s burgeoned into wide-scale poverty alleviation efforts in the 1970s focused on improving access to healthcare, education, and employment. Such large-scale federal efforts have probably contributed to the changes in the number of distressed counties in Appalachia as well as the United States over time.

Chart 1[7]

Federal Poverty Expenditures as a Percent of GDP
1962-2000

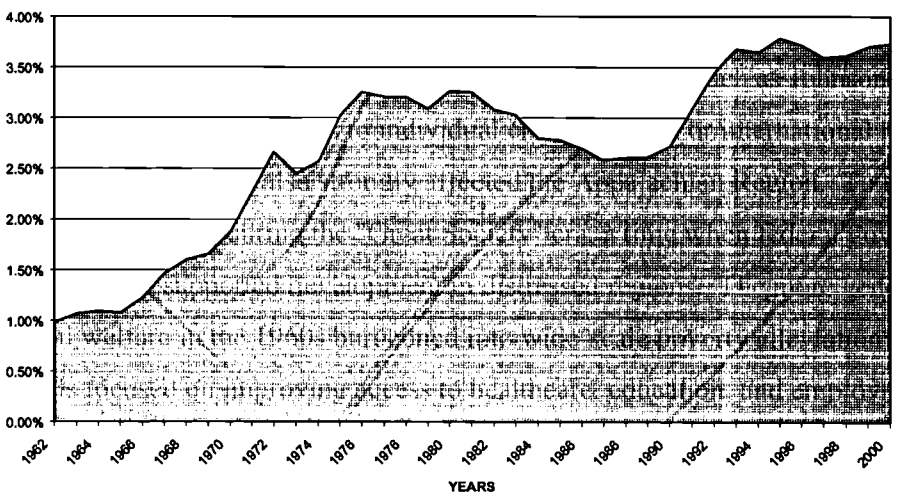
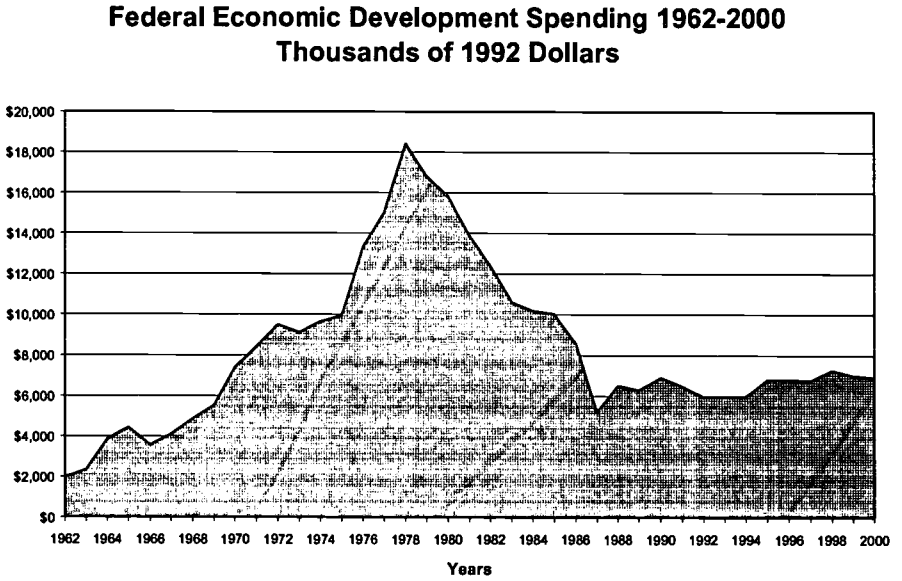


Chart 2[8]



Indeed, the decline in the number of distressed counties between 1960 and 1980, and then the rise in the number of distressed counties between 1980 and 1990 clearly mirror the rise and fall of federal poverty alleviation expenditures as a percentage of gross domestic product, (GDP) as shown in Chart 1. The cutting of what were perceived as "big government" programs and the corresponding decline in both poverty alleviation and economic development expenditures in the 1980s have likely exacerbated some of the problems in the region. Furthermore, as Chart 2 shows, federal economic development expenditures have never recovered to the 1978 peak real-spending levels even after the increases of the 1990s.

Another prominent macroeconomic policy factor was the shift away from the full employment policies of the 1960s and early 1970s, toward inflation-fighting policies spearheaded by higher interest rates and the strong dollar policy of the early 1980s. The inflation-fighting regime brought about a sequence of recessions that shocked many of the older manufacturing sectors of the northern Appalachian Region and generated higher levels of structural unemployment.[9] In another vein, federal policies have generally

resulted in federal expenditures in Appalachia being below the national per capita average.[10] In sum, multiple macroeconomic and policy factors are affecting the Appalachian Region, a thorough discussion of which is beyond the scope of this report. It is important to realize, however, that rather than being isolated, Appalachia and the programs of the ARC are highly influenced by macroeconomic and policy factors that are beyond the scope of the Commission.

The Origin of the ARC

Throughout most of this century, Appalachia has been a region with some of the largest concentrations of impoverished people living in the United States.[11] The report by the President's Appalachian Regional Commission (PARC) in 1964 identified much of this poverty as stemming from Appalachia's relative isolation from the rest of the country.[12] Perhaps ironically, the report noted that federal government investments had largely bypassed the Appalachian Region, potentially exacerbating such isolation.[13] However, in the 1960s this changed, when the federal government became explicitly and in many ways uniquely concerned with Appalachia's economic and social well-being.

In the early 1960s, there was wide bipartisan agreement in Congress that problems of lagging regions could not be resolved by private initiative alone.[14] At that time, the federal government made a previously unparalleled commitment to regional development. This commitment was reflected in, amongst other things, the establishment of the Area Redevelopment Administration (ARA). Inaugurated in 1961, the ARA was representative of the federal government's increased concern and commitment to supporting programs designed to improve socioeconomic conditions both regionally and nationally. The ARA set a new precedent for federal government aid to poor regions.[15] However, while the ostensible goal of the agency was to help regions such as Appalachia, many federal, state, and local-level Appalachian politicians were dissatisfied with ARA programs and the lack of attention that the agency was giving Appalachia.[16]

In 1963, amidst Appalachian governors' growing discontent with federal aid programs, record floods in Central Appalachia, and increased media attention on

Appalachian poverty, President Kennedy fulfilled his campaign promise to address Appalachia's social and economic woes by creating the PARC. The PARC was designated to assess Appalachia's socioeconomic conditions and to develop a "comprehensive action program for the economic development of the Appalachian Region."[17] Not surprisingly, the PARC determined that Appalachia lagged behind the rest of the United States; according to the PARC report, the "realities of deprivation" in Appalachia included low income, high unemployment, lack of urbanization, and deficits in both educational attainment and living standards such as housing quality.[18] The PARC report, if not the concern that led to the initiation of the PARC itself, resulted in the passage of the Appalachian Regional Development Act (ARDA). The ARDA, much of which was based upon the PARC's recommendations, had four principal titles: Title I established the ARC; Title II specified major programs, including highway, health, vocational education, housing, and sewage treatment programs; Title III defined local development districts (LDDs), which were multi-county districts through which most ARC programs, except the highway program, were to be proposed and implemented; and Title IV defined the Appalachian Region.[19] By 1967, ARC-defined Appalachia included 397 counties in 13 states. In the mid-1980s, two more counties were added, and in fiscal year (FY) 1999, Congress added seven counties to bring the total of ARC counties to 406.

The ARC's attempt to develop Appalachia is perhaps the most comprehensive regional development effort ever undertaken in this country.[20] Since 1965, the ARC, along with state and local governments in Appalachia, has spent more than $15 billion on economic and social development programs throughout the Appalachian Region.[21] Highways have received the majority of these expenditures; the remaining funds have supported what the ARC terms "area development" projects. Such projects are aimed at promoting business and community development and improving education, health, housing quality, and infrastructure.[22]

ARC Policy: From Growth Centers to Distressed Counties

From its inception, the ARC endorsed a growth center strategy.[23] This policy was designed to promote economic growth and development in Appalachia's urban areas and was implemented as a result of the mandate in the ARDA for the ARC "to concentrate its investments in areas with a significant potential for future growth where the return on public dollars invested will be the greatest."[24] The ARC's growth center policy supported the development of Appalachia's urban centers. According to growth center theory, development in these urban centers, or growth centers, would eventually "trickle down" to the region's rural and more economically disadvantaged areas.[25] The growth center concept was influenced by regional development theory prevalent in the 1960s and was a strategy employed by many governments throughout the world at that time.[26]

Largely because of the Commission's growth center policy, urban areas in the Appalachian Region received the majority of ARC funds throughout the early years of the Commission's existence.[27] By the mid-1970s it became evident that the ARC was no longer implementing its original growth center policy, largely because of the political difficulties associated with concentrating public investments in relatively few places.[28] Nonetheless, the most impoverished areas of the Appalachian Region continued to receive relatively little attention throughout the 1970s.[29] In the early 1980s this changed. In 1981, Congress requested a report from the ARC outlining "a plan for finishing up ARC programs in a reasonable period of time."[30] Faced with what the Appalachian governors and ARC staff members perceived as a serious threat that the federal government would dissolve the ARC, the report submitted to Congress was in many ways designed to further justify and preserve the Commission. Included in the report's "Finish-Up Program" were various policy measures, including a Distressed Counties Program. The seeds of the Distressed Counties Program—a program now almost two decades in existence—were sown in the following wording in the report:

> More than 900,000 Appalachians live in the 60 most distressed and underdeveloped counties in the Region. . . . Many of the communities in these counties still lack even the most basic facilities, and the lack of these facilities limits the opportunities to meet housing needs. The proportion of

> housing without adequate plumbing is three times the national average. Poverty and unemployment rates are disproportionately high. The communities lack some of the most basic facilities and the resources to provide them. . . . 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 the 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.[31]

Though the ARC's continued existence remained seriously threatened throughout the 1980s and funding appropriations to the Commission were significantly curtailed, especially during the Reagan years, the ARC continues to operate today, and the Distressed Counties Program has become one of the Commission's more eminent undertakings.

III. The ARC Distressed Counties Program

The Distressed Counties Program was adopted as ARC policy and made effective at the beginning of FY 1983.[32] The policy established a 20 percent allocation of Area Development funds for projects in distressed counties and 20 percent match rates by state and/or local governments. To identify distressed counties, the Commission selected variables that were not susceptible to short-term variation. For example, to minimize the influence of potential short-term fluctuations in unemployment in determining distressed status, the ARC decided to use three-year average unemployment rates. In sum, when determining what variables to use to define distress, the ARC hoped to select variables that would identify counties with the structurally weakest economies.

Initially, the ARC selected the following criteria:

- Unemployment rate (three-year average);
- Poverty rate;
- Per capita market income (PCMI, which is income excluding transfer payments); and
- Infant mortality (three-year average).

Counties were ranked among all ARC counties and had to be in the lowest quartiles in at least three of the four categories to qualify as distressed.

In FY 1988, the Commission discontinued using infant mortality as a measure of distress because the region's rate had converged to the national rate. In addition, the remaining indicators were indexed to national averages.[33]Furthermore, the Commission added a second and third economic designation for *middle* and *competitive counties*, and it set 50 and 70 percent matching rates respectively for projects in middle and competitive counties. Each state designated *competitive counties* in its state plan using the following criteria:

- Poverty rates at or below national averages;
- Three-year unemployment rates at or below national averages; and
- Per capita market income no less than 80 percent of the national average.

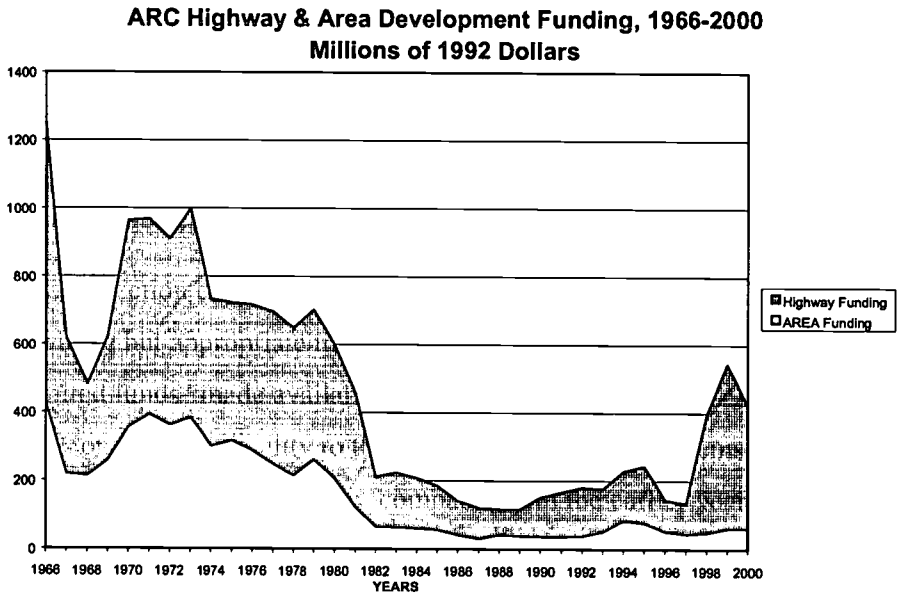
Furthermore, the Commission began tracking its counties using a five-category system: severely distressed; distressed; middle; strong; and very strong. These additional categories, however, were not used for allocation or funding purposes.

In FY 1995, the Commission modified its distress designation.[34] If a county had a poverty rate that was at least 200 percent of the national average, then it would need to match only one of the two remaining criteria (150 percent unemployment or two-thirds PCMI) to be considered distressed. In FY 1997, the Commission added a fourth designation for *attainment counties* that reached or were better than national averages for all three criteria. The Commission annually determines all four economic categories: distressed, transitional, competitive, and attainment. Currently, Area Development distress allocations are 30 percent, and attainment counties are ineligible for Area Development funds. [35]

One of the biggest concerns that the ARC has with the distress indicator is the inconsistent lack of dependable poverty data—data to determine official poverty rates are collected only once every ten years, during the U.S. Census.[36] Nonetheless, the ARC believes that its distress measure has proven to be a sufficiently objective and reasonable measure on which to base both policy and appropriations.[37] Furthermore, according to

the ARC, "the selection criteria are understood and intended by the Commission to be very conservative but appropriate in view of the very limited funds available."[38] Indeed, the "very limited funds" made available to the ARC since the early 1980s have likely hindered the Commission's ability to thoroughly address the problems of the region's distressed counties. As Chart 3 shows, compared with the earlier years of the program, the ARC began receiving scant appropriations from Congress in the early 1980s, coinciding

Chart 3[39]



with the inauguration of the Distressed Counties Program. In the 1980s, the Reagan administration and much of the American public had become wary of "big" government programs, and funding to the ARC and similar types of programs significantly decreased. Under the Bush administration there was a slight increase in appropriations to the ARC and then a larger increase under the Clinton administration; nonetheless, current appropriations to the Commission remain low compared with funds received during the earlier years of the program.

As mentioned, the ARC currently allocates up to 30 percent of all Area Development funds specifically for distressed county projects.[40] Almost any project addressing a development need in a distressed county is eligible for funding, with the ARC providing up to 80 percent of project costs in distressed counties.[41] However, states can use other ARC appropriations that are not specifically designated for distressed counties to fund projects in distressed counties. According to the ARC, total spending on single-county grants to distressed counties from fiscal years 1983 through 1999 has been $266 million, representing about 42 percent of all single-county grants.[42] In addition, $297 million in multi-county grants have been awarded throughout the region over the 1983-1999 period, but it is not possible to break out the historical trends for distressed and non-distressed multi-county areas.[43]

The ARC is not unique in its efforts to aid areas of special need. Agencies such as the U.S. Department of Agriculture (USDA), the Economic Development Administration, and the Tennessee Valley Authority address what might be considered individually distressed areas within their jurisdictions. In fact, the jurisdictions of many of these agencies overlap with that of the ARC. Furthermore, all 13 Appalachian states make special provisions for economically distressed areas. Such programs address a wide range of geographic units, from entire counties to small communities, and most agencies use at least one or all of the same indicators that the ARC uses to measure distress.[44] In sum, the Distressed Counties Program can be considered the ARC's attempt to identify and support the most socially and economically disadvantaged areas within the Appalachian Region.

IV. Analysis of Economic Distress in Appalachia: 1960 to 1990

There have been a number of analyses in the academic literature regarding the ARC and its programs, and the ARC itself has written literally hundreds of reports pertaining to its own programs and policies. Much of the early research written about the ARC was critical, particularly of the Commission's policies.[45] However, more recent

research has commended the ARC and has associated a significant share of the socioeconomic improvement in Appalachia with the agency's efforts.[46] Aside from in-house analyses by the ARC—primarily to designate distressed counties for funding purposes—there are relatively few analyses of the ARC's Distressed Counties Program. To date, Amy Glasmeier and Kurt Fuellhart provide the most thorough account of the Distressed Counties Program.[47] Their report, among other things, identifies socioeconomic characteristics associated with distressed counties in Appalachia since 1980. According to their research, factors associated with counties being distressed include low levels of educational attainment; a high percentage of young, single mothers; a large elderly population; and a low percentage of income from both the manufacturing and retail sectors. Their research also demonstrates various locational characteristics associated with distress; counties located either in or adjacent to metropolitan areas, in the southern part of the ARC Region, or on the edge of Appalachia have been typically less likely to be distressed than other counties in the region.

This report builds upon previous socioeconomic assessments of Appalachia. First, it presents an analysis of data for the years 1960, 1970, 1980, and 1990 to determine the number of distressed counties in the United States and in Appalachia. Prior to this report, no research identified distress in Appalachia using a consistent measure over such an extended period. Second, this report attempts to determine factors associated with long-term distress as well as a county's ability to move out of distress in the region. Third, this report provides an extensive historical analysis of distress in Appalachia. It is important to note that this report considers only the 399 counties that were part of the ARC Region during the period studied (see maps 1-5 in Appendix B), though the distressed status of the counties that were recently added to the ARC Region is included in Appendix A. Explicit details regarding the research methodology as well as information concerning the data used in this analysis are included in Appendices C and D.

Number of Distressed Counties in Appalachia and the United States 1960-1990

In order to benchmark the changes in distress levels within Appalachia and the nation over the 1960 to 1990 period, the ARC's current distress criteria were applied to data on all the counties in the United States for the decennial census years 1960, 1970, 1980, and 1990.* As a result, comparable distress levels could be computed for the two decades prior to the inception of ARC's Distressed Counties Program (see Appendix C). In addition, national distress trends could be examined over the 30-year period, thereby revealing trends within the nation and the Appalachian Region.

Tremendous progress was made in reducing the number of distressed counties within the Appalachian Region over the 1960-80 period. The number of ARC counties designated as distressed declined sharply from 214 in 1960, to 161 in 1970, to 78 in 1980. These gains, however, were eroded during the 1980s as the number of distressed counties rose in 1990 to 106.[48] Of the 214 counties that were distressed in 1960, 98 counties remained distressed and 116 were no longer distressed by 1990. Throughout the remainder of this report, the counties that were distressed in both 1960 and 1990 will be referred to as "persistently distressed" counties, while counties that were distressed in 1960 but no longer distressed in 1990 will be referred to as having moved out of distressed status. Sixty-one counties were distressed in all years and can be referred to as the hard core of persistently distressed counties.

The number of distressed counties by state is presented below in Table 1, and Maps 1-6 in Appendix B indicate the location of distressed counties in the Appalachian Region. A listing of all of the distressed counties in Appalachia by year is included in Appendix A.

* The criteria were virtually the same with one exception, as the unemployment rate was based on a single-year rate rather than the three-year average normally used. This was done because comparable data was not available for the years just prior to and after each of the decennial years.

Table 1
Distressed Counties by State

STATE	TOTAL ARC COUNTIES	1960	1970	1980	1990[1]	DIST. 1960 AND 1990	DIST. 1960, NOT 1990
AL	35	24	13	2	1	1	23
GA	35	14	3	1	0	0	14
KY	49	44	41	34	38	38	6
MD	3	1	1	0	0	0	1
MS	21	20	19	7	10	10	10
NC	29	15	13	3	2	2	13
NY	14	0	0	0	0	0	0
OH	29	7	6	2	11	7	0
PA	52	2	0	0	2	1	1
SC	6	0	0	0	0	0	0
TN	50	37	27	17	7	7	30
VA	21	14	8	1	5	5	9
WV	55	36	30	11	30	27	9
Total	399	214	161	78	106	98	116

[1] Note that the number of distressed counties in 1990 differs from the number officially designated by ARC as distressed counties because distress levels were frozen during the 1988-1992 period while the Commission awaited new poverty rate data from the 1990 census.
For a detailed description of the data sources, see Appendix D.
For Distressed Thresholds, see Appendix C.

The general decline in distressed counties in Appalachia from 1960 to 1980, as well as the rise in the number of distressed counties between 1980 and 1990, clearly mirrors national trends, as indicated in Table 2 below. Furthermore, as maps 7 and 8 in Appendix B reveal, the greatest decrease in distress, both within Appalachia as well as nationally, occurred in the southern region of the United States.

Table 2
Distressed Counties in Appalachia and the United States

YEAR	U.S.[1]	APPALACHIA
1960	676	214
1970	557	161
1980	286	78
1990	325	106

For a detailed description of the data sources, see Appendix D
For Distressed Thresholds see Appendix C.
[1] Does not include ARC counties

Individual Distress Measures and Corresponding Policy Trends

There are a few trends potentially hidden within the broader distress measure that underscore some of the problems that the ARC faces in attempting to improve the

socioeconomic conditions throughout much of the Appalachian Region. For example, many of the counties that had moved out of distress by 1990 still did not compare favorably with national averages in terms of unemployment, poverty, and income (Table 3). Poverty levels in these counties were considerably above the national average in 1990, while PCMI in many of these counties was less than two-thirds the national average at that time. Indeed, a number of counties that emerged from distress between 1960 and 1990 remained, in 1990, precipitously close to becoming distressed again. Rates of poverty, unemployment, and PCMI, when considered together, however, were not enough to qualify these counties as distressed in 1990. Nonetheless, in many cases two of the distress indicators often exceeded the individual distressed standards. It is also important to note that the counties that eventually moved out of distress had much lower rates of poverty and unemployment and higher PCMI in 1960 than the counties that remained distressed. It appears that the counties in Appalachia that emerged from distress actually had a head start: they were not as distressed in 1960 as the counties that remained distressed over time. This is an important factor to consider when assessing the ability of counties to move out of distressed status.

Table 3
Individual Distressed Variables by Year

	U.S. AVERAGE	APPALACHIAN AVERAGE	DISTRESSED 1960, NOT 1990	DISTRESSED 1960 AND 1990
PCMI 1960	$1,639	$1,267	$828	$769
PCMI 1970	$3,490	$2,718	$2,074	$1,745
PCMI 1980	$7,909	$6,339	$5,143	$4,887
PCMI 1990	$15,636	$12,125	$10,251	$7,773
Poverty 1960	22.10%	31.13%	49.88%	53.42%
Poverty 1970	13.74%	18.13%	27.10%	35.87%
Poverty 1980	12.40%	14.01%	18.50%	22.94%
Poverty 1990	13.12%	15.23%	17.52%	28.01%
Unemployment 1960	5.14%	6.77%	6.40%	9.87%
Unemployment 1970	4.37%	4.46%	4.85%	6.90%
Unemployment 1980	6.52%	7.73%	7.89%	10.94%
Unemployment 1990	6.31%	6.82%	6.56%	12.24%

For a detailed description of the data sources, see Appendix D.
For Distressed Thresholds, see Appendix C.

The individual distressed measures indicate far worse conditions for the persistently distressed counties. The unemployment rates in these counties were alarmingly high throughout the period studied and were exceptionally higher in 1990 than

they were in 1960. Furthermore, 1980 and 1990 poverty rates in the persistently distressed counties indicate that these counties might be losing ground not only to the rest of the United States but to the rest of Appalachia as well: between 1980 and 1990, poverty rates increased from 23 to 28 percent in the persistently distressed counties, while poverty rates in the rest of Appalachia increased at a much lower rate. The relatively poor economic conditions in the persistently distressed counties are further signified by the fact that in 1990 such counties had less than half the national average in PCMI. However, it is also important not to overlook much of the improvement that has taken place in many of these distressed counties over the past few decades that is not reflected in the distress measure. For example, other analyses have demonstrated tremendous improvement in housing quality and healthcare throughout the entire Appalachian Region since the inception of the ARC.[49]

To summarize, while there has been a tremendous decline in the number of distressed counties in Appalachia since 1960, many of the counties that emerged from distress during that time still did not have employment, poverty, and income rates that compared favorably with national averages in 1990. Furthermore, many of the persistently distressed counties, according to some indicators, gained little if any ground compared with the rest of the nation between 1960 and 1990.

It is important to note that changes in poverty and unemployment rates both regionally and nationally correlate with the changes in poverty alleviation expenditures and full employment policies of the federal government. As poverty expenditures rose throughout the 1960s and 1970s, poverty rates fell, and as such expenditures as a share of gross national product leveled off and actually declined between 1980 and 1990, poverty rates began rising. There are similar trends regarding the federal government's full employment policies as unemployment data in Table 3 show: unemployment rates fell across the board in 1970 and then rose thereafter, corresponding to the peak and decline of such employment policies.

Individual distress indicators as well as levels of distress closely mirror trends in national policy. Moreover, distress trends in Appalachia mirrors ARC spending, with relatively high expenditures and corresponding improvement in the number of distressed counties until the 1980s. The increase in the number of distressed Appalachian counties

parallels the substantial decline in ARC expenditures beginning in the 1980s. However, distress in Appalachia should not be understood as entirely related to ARC efforts. Indeed, the variation in distress levels is best understood as a result of the interaction of various complex socioeconomic trends, macroeconomic factors, and federal-level policies, including the policies of the ARC. The ARC was a small but significant part of the aforementioned federal government economic development and poverty alleviation efforts that began in the early to mid-1960s. Taken together, federal government and ARC efforts as well as macroeconomic factors provide a fairly clear context in which to understand the patterns of distress both regionally and nationally. As the next section of this report shows, a number of factors and policy measures are related to trends in distress levels.

Regional, Macroeconomic, and Policy Trends Affecting Distress

There were distinct regional trends in Appalachia in terms of distressed status during the period studied. Close to three-quarters of the Appalachian counties that moved out of distress between 1960 and 1990 were in Southern Appalachia. This sub-region showed a steady decrease in the number of distressed counties, even between 1980 and 1990 when the total number of distressed counties in all of Appalachia rose dramatically. The decline in the number of distressed counties in Southern Appalachia between 1960 and 1990 was at least partially the result of broader regional and macroeconomic trends, and is related to the overall decline in distressed counties between 1960 and 1990 in the southern United States.

One of the explanatory factors regarding the precipitous decline in the number of distressed counties in the southern ARC region is the post-World War II economic growth in the South.[50] Increased industrialization and urbanization in the region have fueled much of this growth. The number of jobs in manufacturing has steadily grown in the southern United States over the past half-century, and along with this growth has come economic improvement for many counties in the region, as manufacturing jobs have often supplanted low-wage, agricultural jobs.[51] Many of the counties that emerged from distress in the southern ARC region had consistent growth in manufacturing jobs

throughout the period studied. However, simply because a county had high rates of manufacturing jobs and was able to emerge from distress does not mean that its socioeconomic conditions compared favorably with either the rest of the nation or even much of Appalachia. The growth in manufacturing in the South was in many respects the result of manufacturing firms seeking out lower wage, non-unionized workers and favorable business climates. The results have simply been, for the most part, an increase in low-wage, low-skilled manufacturing jobs in the region. Indeed, manufacturing jobs in Southern Appalachia, relative to such jobs elsewhere in the United States, generally pay lower wages.[52] Moreover, the status of manufacturing jobs in the South, and rural America in general, is becoming increasingly precarious, as the same factors that originally contributed to manufacturing relocating to the South—low wages and favorable business climates—are leading firms beyond the nation's borders. To be sure, "globalization" has already exposed a number of communities in Appalachia to considerable job loss, as manufacturing plants are increasingly considering locations almost anywhere in the world.[53] Nonetheless, it is important to keep in mind that an increase in manufacturing jobs has generally improved the economic conditions in Southern Appalachia, leading to the decline in distress in the region over the past few decades. The southern Appalachian Region has also particularly benefited from demographic and economic spillover effects from some of the growing cities in the South, including Atlanta, Charlotte, Memphis, and Nashville, which have been some of the fastest growing cities in the country during the second half of this century.[54]

The success throughout much of the South is in stark contrast to a number of counties, especially in Kentucky, West Virginia, and Mississippi, that have remained persistently distressed over time. More than three-quarters of the ARC counties in Kentucky and close to half of the ARC counties in both West Virginia and Mississippi were distressed in both 1960 and 1990. The spatial patterns of persistent pockets of distress in both Appalachia and the nation are depicted in Map 8 in Appendix B.

The poor economic conditions in Central Appalachia can be attributed to a variety of factors, including the region's relative isolation from major urban areas and its rugged terrain, which adversely affects the accessibility to jobs as well as the ability of the region to attract employment opportunities. In addition, the region's continued dependence on

extractive industries, particularly coal mining, has defined and limited the options for a diversified economy. A number of the counties that had emerged from distress by 1980 but then fell back into distress in 1990 were in Central Appalachia, especially West Virginia. This decline and then reversal in distressed status can at least be partially explained by the coal industry boom in the 1970s, relating to the oil crises of 1973 and 1979, and the subsequent bust of coal prices in the 1980s and 1990s.[55] Boom and bust cycles have historically had correspondingly positive and negative impacts upon Central Appalachia, and many of the Central Appalachian counties that were not distressed in 1980 but had become distressed again in 1990 were "coal counties" in Kentucky, West Virginia, and Virginia. West Virginia, the victim of the decline not only in coal prices but also in manufacturing jobs moving out of the state, saw its number of distressed counties increase from 11 to 30 between 1980 and 1990.

Outside the Appalachian Region, persistent distress stands out in the Mississippi Delta Region (see Map 8). This persistence of distress in the Delta Region reflects the historical reliance upon low-wage agricultural employment, the lack of economic diversification , the relatively high poverty rates of African Americans living in the region, and the legacy of cultural and economic discrimination.[56]

A third trend is the consistent lack of distressed counties in the North, especially in New York and Pennsylvania. The Northeastern United States has historically had a stronger economy and been more urbanized than the rest of Appalachia as well as the rest of the United States.[57] However, there was a dramatic increase in the number of distressed counties in Ohio between 1980 and 1990, from two to eleven, as well as an increase from zero to two distressed counties in Pennsylvania during that time. Much of this distress is the result of manufacturing jobs leaving the North, otherwise known as the rust-belt effect.[58] Some counties in Ohio, Pennsylvania, and West Virginia saw the percentage of jobs in manufacturing in their counties decrease dramatically during the period studied, and the erosion of the northern manufacturing base has had an especially adverse effect on communities throughout the northern Appalachian states. In fact, trends in manufacturing that have helped diminish the number of distressed counties in Southern Appalachia have increased the number of distressed counties in the North. Furthermore, in contrast to the growing population of the South, many northern

Appalachian counties are experiencing steady outmigration. In general, however, the northern Appalachian sub-region fared well in terms of distressed counties throughout the period studied.

To summarize, distressed status in Appalachia is best understood in the context of a variety of trends, including what may be considered regional trends specific to the north, central, and southern Appalachian sub-regions. A range of regional, macroeconomic, and policy factors have been presented in this and previous sections as factors that have had a major impact on distressed levels. Furthermore, additional macroeconomic trends have likely had an adverse impact on distressed status both in Appalachia and the nation during the period studied, including the lack of real wage growth in many unskilled manufacturing and service-sector jobs since the mid-1970s, and the general widening of income inequality both nationally and regionally.[59] While these factors and the previously related macroeconomic trends and policy measures have not been analyzed statistically for this report, they have been widely commented upon as sources fueling trends in poverty both nationally and regionally.[60] A separate statistical analysis of these trends, though beyond the scope of this research, is certainly an area worthy of future research consideration. The next section of this report will use statistical analyses to further explore some of these macroeconomic trends. It will also attempt to determine other factors that may be associated with distress in the Appalachian Region.

Other Factors Associated with Distress

To corroborate some of the trends that are apparent in the analysis of the number and general location of distressed counties over time, this section of the report uses statistical modeling techniques to determine factors associated with persistent distress and a county's ability to move out of distressed status. It does not examine these factors controlling for the influence of the previously mentioned macroeconomic and policy trends, though acknowledges that such factors have likely influenced distressed status. Logistic regression and statistical comparisons of means are the two types of statistical analyses used in the analysis below. In general, logistic regression analysis estimates the effects of different variables on the probability of a certain type of outcome, which in the

case of this research is the probability of a county either remaining distressed or moving out of distressed status. Two models are developed: one that can be broadly characterized as the socioeconomic model and one that can be characterized as the economic structure model. These models test only persistently distressed counties and counties that have moved out of distress; thus, they do not include Appalachian counties that were never distressed. In addition to the logistic regression models, other statistical tests, primarily involving the comparison of means, are also used to analyze factors that may contribute to distress or the movement out of distress. Explanations of all the statistical techniques used in this analysis, along with the various assumptions incorporated in the modeling, are included in Appendix C. In sum, the statistical analyses, taken in context with the previously mentioned macroeconomic and policy trends, provide an indication of factors that have been associated with both the declining number of distressed counties in the Appalachian Region and the inability of some Appalachian counties to emerge from distress between 1960 and 1990.

The results of the logistic regression analyses support some of the earlier hypotheses concerning macroeconomic factors, while providing further insight regarding factors associated with distress in the Appalachian Region. Both the *socioeconomic* and the *economic structure* logistic regression models had exceptionally high prediction rates.[61] According to the *socioeconomic model* (see Appendix C, Model 1) factors contributing to a county moving out of distress between 1960 and 1990 included high rates of employment in manufacturing; high educational attainment rates; a high percentage of the population living in urban areas; a low percentage of minorities; and a county's location in the southern Appalachian sub-region. According to the *economic structure model* (see Appendix C, Model 2), the factors associated with a county moving out of distressed status were a county's ability to attract retirees; high levels of manufacturing; and location in a metropolitan area. Factors associated with counties remaining distressed were high levels of employment in mining or government.

The other statistical tests in this analysis were consistent with findings of the logistic regression analysis. The remainder of this section will describe in greater detail the factors associated with distress as determined by the statistical methods used in this analysis. For the sake of clarity, rather than considering the individual models and

statistical analyses in turn, the following analysis will generally discuss the various factors that were determined by the statistical tests to be influential in determining distressed status in Appalachian counties over time.

Locational and Demographic Factors

The socioeconomic logistic regression model clearly indicates that one of the factors associated with a county's ability to emerge from distressed status is its location in the southern part of the ARC region. A county's location in the southern sub-region of Appalachia was the most influential variable in predicting distressed status in the socioeconomic model. As previously mentioned, more than 75 percent of the counties in Appalachia that emerged from distress between 1960 and 1990 were in the southern part of the region. Thus, the socioeconomic model further confirms that a county's ability to emerge from distress was significantly enhanced by its location in Southern Appalachia.

While regional trends certainly have had an impact upon distressed status in the Appalachian Region, other locational factors also seem to be influential in determining distress. Counties that became part of a metropolitan area clearly had an easier time emerging from distress than counties that had not become part of a metropolitan area (Table 4). Seventeen of the counties that were distressed in 1960 but no longer

Table 4
Locational Characteristics of Appalachian Counties

	APPALACHIA	DISTRESSED 1960, NOT 1990	DISTRESSED 1960 AND 1990
% Urban Pop. 1960	47.21%	22.52%	15.14%
% Urban Pop.1990[1]	47.22%	24.25%	15.39%
Metro County 1963	42	2	1
Metro County 1993[1]	109	19	3
Adjacent to Metro County 1993	137	38	29

[1] $t < 0.05$ (comparison between distressed 1960/1990 and distressed 1960/not 1990)
For a detailed description of the data sources, see Appendix D.

distressed in 1990 had become officially designated metropolitan counties during that time. Many of these counties had grown because of the urban spread effects from southern cities in and outside the Appalachian Region, such as Atlanta, Birmingham, Chattanooga, and Knoxville, that experienced tremendous growth during the period

studied. Metropolitan counties with populations ranging between 250,000 and 1 million were the most likely of all metropolitan counties to have emerged from distress.

While counties that became parts of metropolitan areas saw their income, employment, and poverty rates improve to the point where they were no longer distressed, a more interesting finding may be that metropolitan adjacency was not a significant factor in a county's ability to emerge from distress. Indeed, counties adjacent to metropolitan areas did not necessarily fare any better than counties that were not adjacent to metropolitan areas. Moreover, the a review of the data reveals that a number of counties that were neither part of a metropolitan area nor adjacent to a metropolitan area nonetheless managed to successfully move out of distressed status during the period studied. Such a finding is important because Appalachia is relatively more rural than the rest of the United States, providing hope for a number of counties that have little possibility of benefiting from metropolitan growth.[62]

The percentage of people living in urban areas, as shown in Table 4, highlights the rural nature of Appalachia. By 1990, 75 percent of the American population was living in what the census defined as an urban area; but this number was remarkably lower in Appalachia (47 percent) and even more so in the persistently distressed counties (15 percent). According to the census, urban areas are generally "places" with 2,500 people or more. It is important to understand the differences between urban and metropolitan areas, and likewise rural and nonmetropolitan areas: urban areas are not necessarily metropolitan areas or parts of metropolitan areas; and nonmetropolitan areas are not necessarily rural. In the case of Appalachian nonmetropolitan counties, such "urban" areas largely refer to towns with populations of 2,500 or more, and small cities with populations below 50,000.

The results of the socioeconomic model confirm the relative importance of rural locations in determining distressed status. The results indicate that counties moving out of distress typically had a greater percentage of people living in "urban areas" than counties that remained distressed. While a number of nonmetropolitan counties and adjacent nonmetropolitan counties were able to emerge from distress, it seems that the likelihood of such counties emerging from distress is increased when it has a greater percentage of its population living in "urban areas." In sum, though counties do not

necessarily need to be proximate to metropolitan areas to increase their chances of emerging from distress, counties with a greater majority of people living in what may be considered urban areas are more likely to have emerged from distress than counties with fewer people living in urban areas. Not surprisingly, it is the most rural counties in Appalachia, counties with a relatively dispersed population, that have remained persistently distressed over time.

Employment by Type of Industry and Distress

Employment by industry is also an important factor relating to a county's ability to emerge from distress as indicated by both logistic regression models and the variables included in Tables 5 and 6. The socioeconomic model indicated that counties with a lower percentage of the workforce employed in manufacturing were less likely to emerge from distress than counties with higher rates of the workforce employed in manufacturing.

Table 5
USDA Economic Research Service Economic Typology Variables

	APPALACHIAN TOTAL	DISTRESSED 1960, NOT 1990	DISTRESSED 1960 AND 1990
Farming Dependent	6	2	2
Mining Dependent[1]	41	4	30
Manufacturing Dependent[1]	121	48	18
Govemment Dependent[1]	23	5	14
Services Dependent	31	10	8
Non-Specialized[1]	177	47	26

[1] $t < 0.05$ (comparison between distressed 1960/1990 and distressed 1960/not 1990)
For a detailed description of the data sources, see Appendix D.

The economic structure model provided similar results, indicating that manufacturing-dependent counties were more likely to have emerged from distress than counties that were not manufacturing dependent. In short, counties with a high percentage of the workforce employed in manufacturing showed a tremendous ability to emerge from distress. As previously mentioned, however, an increase in manufacturing jobs, though providing the ability to lift counties out of distressed status, has not necessarily brought wages in many Appalachian counties up to the levels of the national average. While increased employment in manufacturing has enabled many counties in

the Appalachia Region to move out of distress, it does not necessarily improve socioeconomic conditions to the point where they compare favorably with national averages. In other words, manufacturing may be a prescription for counties moving out of distress, but it is not necessarily a sufficient condition for overall economic prosperity. This finding implies that wage-based competition in industrial recruitment may have long-term negative impacts upon a community's economy.

While manufacturing may be associated with counties moving out of distressed status, this research indicates that a high percentage of jobs in mining is associated with counties remaining distressed. Though not significant in the socioeconomic model, the economic structure model suggests that mining-dependent counties were more likely to remain distressed over time.[63] Many of the Central Appalachian counties that have remained persistently distressed, especially in Kentucky, West Virginia, and Southwestern Virginia, are considered coal-dependent counties by the UDSA Economic Research Service (ERS).[64] In fact, most of the mining-dependent counties in the region, 75 percent of the total, were persistently distressed. Though coal mining per se does not result in a county being distressed, research elsewhere regarding "coal counties" has demonstrated that, in general, such counties lag behind even neighboring counties in real per capita income, income distribution, income variability, percentage of families below the poverty line, unemployment, variability of unemployment, and such social measures as infant mortality and high school dropout rates. [65] Such research concludes that these poor socioeconomic conditions serve to discourage residents from making human capital investments that could potentially improve their conditions in the future.

Table 6
Percentage Employed by Industry

	U.S. AVERAGE	APPALACHIAN AVERAGE	DISTRESSED 1960, NOT 1990	DISTRESSED 1960 AND 1990
Services 1960[1]	55.38%	47.96%	41.52%	45.98%
Services 1990[1]	72.75%	65.91%	56.40%	63.32%
Manufacturing 1960[1]	27.69%	32.79%	27.49%	15.46%
Manufacturing 1990[1]	17.69%	23.41%	30.43%	17.48%
Mining 1960[1]	1.01%	3.39%	2.87%	16.90%
Mining 1990[1]	.63%	1.52%	1.29%	8.92%
Ag, Fish, Forest 1960	6.69%	7.14%	18.77%	13.33%
Ag, Fish, Forest 1990	2.69%	2.34%	3.90%	3.01%

[1] $t < 0.05$ (comparison between distressed 1960/1990 and distressed 1960/not 1990)
For a detailed description of the data sources, see Appendix D.

While the percentage employed in service-based jobs is not statistically significant in either of the logistic regression models, persistently distressed counties in the region have a higher percentage of service jobs than the counties that have moved out of distress, which suggests that many of the service-based jobs in such counties pay low wages. Indeed, research elsewhere has suggested that service jobs pay lower wages than other types of jobs in rural areas, and the change in industrial structure from manufacturing to service-based employment in rural areas had cut average pay in such areas by 3 percent in the early 1980s.[66] However, individual types of employment aside, possibly the most important characteristic associated with distress is the extent of employment diversification within a county. Most of the counties that were never distressed—and hence have historically had better socioeconomic characteristics than both the persistently distressed counties and the counties that moved out of distress—are considered "nonspecialized" by the ERS, implying greater economic diversity in such counties, or at least a lack of dependence upon a specific industry. Furthermore, there was a statistical difference between the persistently distressed counties and the counties that had moved out of distress in terms of specialization, as the number of counties that had emerged from distress and were nonspecialized was significantly greater than the number of counties that remained distressed and were nonspecialized.

Social Factors Associated with Distress

A variety of social factors were associated with a county either remaining distressed or having the ability to move out of distress. Educational attainment rates were significantly correlated with a county's ability to move out of distress, as demonstrated in the socioeconomic model, as well as in the statistical comparison of means. In the socioeconomic model, high school educational attainment rates were used as a proxy for educational rates in general, and as the results in Table 7 indicate as such rates improved, the chances decreased that a county would be persistently distressed. What may be the most interesting finding in terms of educational attainment is that in 1960 there was no significant statistical difference regarding the percentage of the population who had some

college between the counties that would remain distressed and the counties that would eventually emerge from distress. But by 1990 this had changed—college educational attainment rates had significantly improved in the counties that had moved out of distress when compared with counties that remained distressed. A variety of factors could explain such change. Perhaps an increase in higher-skilled jobs drew educated people to the counties that emerged from distress, while it is also likely that such counties were better able to retain their more educated constituents. Thus, while it is difficult to ascertain causal relationships using statistical modeling, it is nonetheless clear that there was a correlation between educational attainment rates within a county and a county's ability to emerge from distress.

Table 7
Education Characteristics of Appalachian Counties

	APPALACHIAN AVERAGE	DISTRESSED 1960, NOT 1990	DISTRESSED 1960 AND 1990
12+ yrs. of education 1960[1]	32.84%	21.99%	20.54%
12+ yrs. of education 1990[1]	63.87%	58.55%	54.26%
Some College 1960	11.33%	8.22%	7.52%
Some College 1990*	33.33%	26.95%	21.37%

[1] $t < 0.05$ (comparison between distressed 1960/1990 and distressed 1960/not 1990)
For a detailed description of the data sources, see Appendix D.

Another social factor related to distress was race, especially for counties in the South. Southern Appalachian counties with a relatively high percentage of blacks were far less likely to emerge from distress than counties with predominantly white populations. The counties that moved out of distress in Southern Appalachia had nonwhite populations of 11 and 9 percent in 1960 and 1990 respectively, while the counties in Southern Appalachia that remained distressed had nonwhite populations of 38 and 33 percent in those same years.

The population's age distribution was another factor that contributed to a county remaining distressed according to the socioeconomic model. Counties that remained distressed in 1990 had a higher percentage of children and the elderly residing in their counties than the counties that had emerged from distress. People in these two age groups are often considered dependents, as they typically do not participate in the workforce. Indeed, as Table 8 shows, persistently distressed counties are those that are

Table 8
USDA Economic Research Service Policy Typology Variables

	APPALACHIAN TOTAL	DISTRESSED 1960, NOT 1990	DISTRESSED 1960 AND 1990
Retirement Destination[1]	20	14	2
Federal Lands	23	13	5
Transfer Dependent[1]	85	9	67
Commuter Dependent	69	27	24

[1] $t < 0.05$ (comparison between distressed 1960/1990 and distressed 1960/not 1990)
For a detailed description of the data sources, see Appendix D

highly dependent on federal transfer payments. A greater percentage of the population in these categories indicates a higher percentage of dependents per worker in a county, which is typically less conducive to strong economic conditions as there is a lower percentage of people participating in the labor force. However, it is important to realize that a higher percentage of the elderly is not always the sign of weak economic conditions. The economic structure model indicated that counties that were serving as retirement destinations were more likely to move out of distressed status than counties that were not. Such counties typically attract relatively wealthy retirees and are often endowed with amenities that make them tourist destinations as well. Finally, it is interesting to note that neither a high share of federal ownership of land in a county nor high levels of commuting dependence proved to be significantly associated with changes in distressed status or persistent distress.

As the foregoing analysis shows, a variety of factors are associated with a county's ability to move out of distressed status, ranging from the impact of macroeconomic factors to amenities that may attract retirees or tourists. This analysis of county-level factors associated with distress, combined with the aforementioned macroeconomic and policy-related issues, provides a complex yet relatively clear indication of why many of the counties in the Appalachian Region were able to emerge from distress between 1960 and 1990, while others remained distressed during that same period.

V. Conclusions

Tremendous progress was made in reducing the number of distressed counties within the Appalachian Region between 1960 and 1980 as the number declined sharply from 214 in 1960 to 152 in 1970 and to 79 in 1980. These gains, however, were eroded during the 1980s as the number of distressed counties rose steadily to 106 in 1990. Of the 214 counties that were distressed in 1960, 98 counties remained distressed and 116 were no longer distressed by 1990.

Persistent distress remains a considerable problem; approximately one-quarter of the Appalachian counties remain distressed today. The Appalachian trends clearly mirrors national trends as the number of distressed counties in the rest of the United States fell from 676 in 1960 to 286 in 1980, and then steadily rose to 325 in 1990. By the year 2000 there will be 355 distressed counties outside Appalachia.

The rise in regional and national distress levels can be attributed to several macroeconomic national and international trends, as well as changes in public policies that are largely outside the scope and influence of the ARC.

- The inflation and energy price increases of 1970s, coupled with the anti-inflation and strong dollar policies of the early 1980s, brought about a sequence of recessions that shocked many of the traditional employment sectors of the Appalachian Region and generated higher levels of structural unemployment.
- Anti-inflation policies also shifted national economic policies away from the full employment policies prevalent during the 30 years after World War II.
- The energy boom in the 1970s and bust in the 1980s particularly affected the region's coal-mining sectors.
- Federal poverty alleviation spending as a share of the national economy fell sharply in the 1980s but recovered in the 1990s, while federal economic development funding fell sharply in the 1980s but did not fully recover.
- Household income and industrial wage inequality have increased nationally, and these trends have particularly affected regions that are overrepresented in lower-wage sectors.

Within the Appalachian Region, however, the results of the analysis of the region's county-level economies have identified a number of significant factors that are associated with the movement of counties out of distressed status compared with persistently distressed counties:

- A higher share of manufacturing employment;
- Counties that became part of metropolitan areas, particularly in the South;
- A more diversified economy as reflected by a nonspecialized local economy;
- Higher educational attainment rates for both high school completion and some college;
- A higher percentage of the population living in urban areas (i.e., towns and small cities); and
- The ability of a county to attract retirees to establish residency.

In addition, this research identified several factors that were associated with persistent distressed status as compared with counties that moved out of distress:

- A higher share of mining employment (half of the persistently distressed counties were mining dependent);
- A higher share of minority populations;
- A higher share of children and elderly dependent populations; and
- A higher dependence on government transfer payments.

Key Issues

A variety of issues are associated with the changing status of distress within the Appalachian Region, including macroeconomic and policy factors, as well as local factors such as location, education, and the role of economic diversification. Many of these factors are beyond the control of regional and local economic development institutions. Some factors, however, can be influenced over the longer term by regional and local development institutions, particularly educational achievement levels, and the extent of economic diversification. One factor that stands out as potentially subject to regional and local influence is the extent of manufacturing and the degree of economic

diversification in local economy. Clearly, the overall evidence shows that a high share of manufacturing employment is a good predictor of improvement during the period between 1960 and 1990; yet the story varies by sub-region. In the northern sub-region the absence of many distressed counties, coupled with the high degree of economic diversification in 1960, masks much of the hardship that the northern sub-region experienced with the loss of manufacturing employment. By contrast, the relatively high levels of distress in the southern sub-region were improved by the movement of manufacturing employment into the South. Yet today many of these same industries are vulnerable to the impacts of plant relocation and exports. So while manufacturing may have played a positive role in the past for reducing distress, the prospects for the future role of manufacturing are decidedly different. Indeed, the outlook is good only for the most productive, capital-intensive manufacturing sectors that are supported by a complex of high technology suppliers and professional services in such fields as engineering, product design, marketing, and finance.

Another issue is the vulnerability of coal-dependent counties to the fluctuations of energy prices and the demand for coal. The rising distress in the coal-dependent counties points to the need for greater economic diversification efforts to widen the economic base.

Educational attainment is another prominent factor in predicting improvement. Future trends in the knowledge-based economy leave little doubt that educational attainment will continue to be a key factor for improving the prospects for distressed counties. Perhaps the only concern for local officials is the oft-repeated problem that the most educated students often leave the distressed counties for better opportunities in more prosperous areas. Some states have sought to retain this educated talent by providing entrepreneurial education in order to highlight prospects for local business opportunities that could create economic anchors in the communities.

Another issue that emerges is the relative importance of urbanized areas in distressed counties, including the influence of towns and small cities. The foregoing findings indicate that these urbanized centers play a vital role in the economic base of distressed counties. It may be that past efforts to revitalize these smaller urban centers

have paid off, although the foregoing analysis does not provide enough information to indicate how this may have played out. Clearly, more research is needed on this issue.

The overarching issue, however, is that so much of the improvement in both Appalachia and the rest of the United States occurred during a period when national policy was supportive of full employment and poverty alleviation efforts. This fact suggests that regional economic development is most likely to take place when national policies create the conditions to support it.

This research also indicates the number of distressed counties in the region has generally been rising since the early 1980s, and many Appalachian counties that had seemingly emerged from distress have again become distressed. In FY 2000 there were 111 distressed counties in the region, although partly because new counties have been added to the region. This rise in distress is especially worrisome considering the economic growth that has taken place in the United States throughout the past decade.

In the 1990s, major changes have occurred in national policy and macroeconomic factors that have altered the conditions under which the ARC program is being implemented. One striking change is that as of December 1999, the nation is near full employment with a national unemployment rate at a 30-year low. In addition, poverty alleviation expenditures have risen to all-time highs under the Clinton administration—so why has distress widened both nationally and regionally?

Several factors specific to the Appalachian Region's economy suggest an answer. First, import penetration and plant relocation in labor-intensive industries have had a disproportionate impact on Appalachia, and Southern Appalachia in particular, because the regional economy is over-represented in such sectors. Second, income and wage inequality continues to be a problem for the region. Income inequality has widened both nationally and regionally, and despite a period of strong economic growth and low unemployment, 1997 national income figures indicate that there has been no moderation of income inequality.[67] Within the region, wage pressures have mounted on labor-intensive industries affected by plant closures as there is downward pressure on the remaining workforce in these sectors. Indeed, while job creation has been robust during the past ten years, the issue of job quality remains a major concern. Recent analysis of Appalachian employment by job quality in metropolitan areas presents a mixed picture.

For 1997, female employment was over-represented in less skilled jobs, while male employment had a relatively higher percentage share of higher skilled employment as compared with smaller metropolitan areas elsewhere in the United States.[68] Nonetheless, the data also show an earnings gap for both males and females for all types of jobs, ranging from less skilled to elite jobs.

Third, the industrial mix of the overall economy remains over-represented in lower wage manufacturing, service, tobacco farming, and extractive sectors, and under-represented in the high growth, high-wage sectors. For instance, Appalachian employment in occupations focused on the design, programming, maintenance, and repair of computing and communications technologies has grown robustly during the past ten years to 350,000 high-tech workers, but still stands at less than 5 percent of all information technology (IT) jobs nationally (far below the region's 7.2 percent share of national employment). And while IT jobs are forecast to grow to 417,000 by 2006, this share will represent a declining share of the nation's IT job base.[69]

Another factor is that the region's population is aging at a rate greater than the nation as a whole. Partly, this more rapid aging is a result of continued out-migration of youth, but the net effect is to increase the dependent, non-working share of the population, thereby depressing per capita income. Finally, while poverty alleviation programs have expanded in the past several years, reaching historic highs, federal economic development funding remains far below the historic high point, with 1999 inflation-adjusted levels amounting to only 38 percent of 1978 levels.[70] Thus, the national effort to fund economic development has lessened, leaving distressed regions with fewer resources to catch up with the rapidly growing national economy. Taken together, these factors probably account for the rise in distress during the economic expansion of the 1990s.

Policy Implications

These findings and trends imply a need for a greater policy focus on economic diversification efforts, particularly cultivating job creation in the high-growth, higher wage sectors, including the professional service sectors. Obviously, this is easier said

than done. But the strategic challenge is focusing on developing businesses that demand jobs with higher skills and pay. Meanwhile, the changing role of manufacturing in a diversified economy means that retaining manufacturing in a local economy will require a greater emphasis on stimulating business formation in so-called producer services, such as engineering, product design, marketing, finance, and information services.

The role of urbanized areas in distressed counties also highlights the need to rethink investments for revitalizing the towns and cities in these counties so that they are positioned to attract businesses, particularly those providing professional and business services. While many economic developers have focused on the need for laying the foundations for a high-tech infrastructure in nonmetropolitan areas, there is little solid research to guide such efforts. In addition, more needs to be known about the urban amenities that are needed in towns and small cities to attract and retain professionals in such areas.

Another implication of this research is the increasing importance of education and human capital development in the knowledge-based economy. Distressed areas cannot compete without additional resources being devoted to improving educational achievement at all levels. Given the limited local resources for education, such an expanded effort must rely on outside funds from the federal and state levels. In addition, given the growing share of dependent populations in the region, increased investments in job training and skills upgrading will help expand the effective labor supply. Moreover, additional adult educational opportunities would help expand employment for the underemployed. Furthermore, such employment and training investments will enhance productivity of existing industry and thereby improve the job creation and retention potential of the region.

These findings also suggest that while there has been considerable economic growth and social progress in the Appalachian Region, regional development efforts are most effective when implemented in a context of accommodating macroeconomic trends and supportive national policies. In light of the trends in federal economic development funding, there seems to be a case for expanding the national effort for distressed areas as the federal commitment has not kept pace with the growth in GDP.

In conclusion, despite remarkable improvement in Appalachia's number of distressed counties between 1960 and 1990, a significant number of counties in the region still are distressed and have remained persistently distressed over time. To seriously address such persistent distress, as well as the growing divide between the major metropolitan areas and non-metropolitan regions, the ARC and other regional development agencies will likely need more federal government support. A renewed commitment similar to the one that inspired the establishment of the ARC and the regional development policies of the 1960s is an important step for seriously addressing the socioeconomic problems of Appalachia's distressed counties. Poverty, low wages, and limited employment opportunities are a way of life for many people in such counties, and the embedded nature of distress in such places requires a strategic national and regional effort to solve the problem of persistent distress.

VI. Appendix A: ARC Distressed Counties by Year

1960 Distressed Counties (214)

AL	BIBB	KY	ELLIOTT	MS	NOXUBEE	TN	HAWKINS
AL	BLOUNT	KY	ESTILL	MS	OKTIBBEHA	TN	JACKSON
AL	CHEROKEE	KY	FLEMING	MS	PONTOTOC	TN	JOHNSON
AL	CHILTON	KY	FLOYD	MS	PRENTISS	TN	MC MINN
AL	CLAY	KY	GREENUP	MS	TIPPAH	TN	MACON
AL	CLEBURNE	KY	HARLAN	MS	TISHOMINGO	TN	MARION
AL	COOSA	KY	JACKSON	MS	UNION	TN	MEIGS
AL	CULLMAN	KY	JOHNSON	MS	WEBSTER	TN	MONROE
AL	DE KALB	KY	KNOTT	MS	WINSTON	TN	MORGAN
AL	ELMORE	KY	KNOX	NC	ALLEGHANY	TN	OVERTON
AL	FAYETTE	KY	LAUREL	NC	ASHE	TN	PICKETT
AL	FRANKLIN	KY	LAWRENCE	NC	AVERY	TN	POLK
AL	JACKSON	KY	LEE	NC	CHEROKEE	TN	PUTNAM
AL	LAMAR	KY	LESLIE	NC	CLAY	TN	RHEA
AL	LAWRENCE	KY	LETCHER	NC	GRAHAM	TN	SCOTT
AL	LIMESTONE	KY	LEWIS	NC	JACKSON	TN	SEQUATCHIE
AL	MARION	KY	LINCOLN	NC	MACON	TN	SEVIER
AL	PICKENS	KY	MC CREARY	NC	MADISON	TN	SMITH
AL	RANDOLPH	KY	MADISON	NC	MITCHELL	TN	UNICOI
AL	ST. CLAIR	KY	MAGOFFIN	NC	POLK	TN	UNION
AL	SHELBY	KY	MARTIN	NC	SWAIN	TN	VAN BUREN
AL	TALLADEGA	KY	MENIFEE	NC	WATAUGA	TN	WARREN
AL	WALKER	KY	MONROE	NC	WILKES	TN	WHITE
AL	WINSTON	KY	MORGAN	NC	YANCEY	VA	BATH
GA	DADE	KY	OWSLEY	OH	ADAMS	VA	BLAND
GA	DAWSON	KY	PERRY	OH	GALLIA	VA	BUCHANAN
GA	FANNIN	KY	PIKE	OH	JACKSON	VA	CARROLL
GA	FRANKLIN	KY	POWELL	OH	MEIGS	VA	DICKENSON
GA	GILMER	KY	PULASKI	OH	MONROE	VA	FLOYD
GA	HEARD	KY	ROCKCASTLE	OH	PIKE	VA	GRAYSON
GA	LUMPKIN	KY	ROWAN	OH	VINTON	VA	HIGHLAND
GA	MADISON	KY	RUSSELL	PA	FAYETTE	VA	LEE
GA	MURRAY	KY	WAYNE	PA	HUNTINGDON	VA	RUSSELL
GA	PICKENS	KY	WHITLEY	TN	BLEDSOE	VA	SCOTT
GA	RABUN	KY	WOLFE	TN	CAMPBELL	VA	TAZEWELL
GA	TOWNS	MD	GARRETT	TN	CANNON	VA	WISE
GA	UNION	MS	ALCORN	TN	CARTER	VA	WYTHE
GA	WHITE	MS	BENTON	TN	CLAIBORNE	WV	BARBOUR
KY	ADAIR	MS	CALHOUN	TN	CLAY	WV	BOONE
KY	BATH	MS	CHICKASAW	TN	COCKE	WV	BRAXTON
KY	BELL	MS	CHOCTAW	TN	CUMBERLAND	WV	CALHOUN
KY	BREATHITT	MS	CLAY	TN	DE KALB	WV	CLAY
KY	CARTER	MS	ITAWAMBA	TN	FENTRESS	WV	DODDRIDGE
KY	CASEY	MS	KEMPER	TN	GRAINGER	WV	FAYETTE
KY	CLAY	MS	LOWNDES	TN	GREENE	WV	GILMER
KY	CLINTON	MS	MARSHALL	TN	GRUNDY	WV	GRANT
KY	CUMBERLAND	MS	MONROE	TN	HANCOCK	WV	GREENBRIER

1960 Continued

WV HAMPSHIRE	WV MINGO	WV RALEIGH	WV UPSHUR
WV HARDY	WV MONROE	WV RANDOLPH	WV WAYNE
WV LINCOLN	WV MORGAN	WV RITCHIE	WV WEBSTER
WV LOGAN	WV NICHOLAS	WV ROANE	WV WIRT
WV MC DOWELL	WV PENDLETON	WV SUMMERS	WV WYOMING
WV MASON	WV POCAHONTAS	WV TAYLOR	
WV MERCER	WV PRESTON	WV TUCKER	

1970 Distressed Counties (161)

AL BIBB	KY LEWIS	MS WINSTON	TN MONROE
AL CHILTON	KY LINCOLN	NC ALLEGHANY	TN MORGAN
AL CLAY	KY MC CREARY	NC ASHE	TN OVERTON
AL COOSA	KY MAGOFFIN	NC AVERY	TN PICKETT
AL DE KALB	KY MARTIN	NC CHEROKEE	TN RHEA
AL ELMORE	KY MENIFEE	NC CLAY	TN SCOTT
AL FAYETTE	KY MONROE	NC GRAHAM	TN SEQUATCHIE
AL FRANKLIN	KY MORGAN	NC JACKSON	TN UNICOI
AL JACKSON	KY OWSLEY	NC MACON	TN UNION
AL LAMAR	KY PERRY	NC MADISON	VA BATH
AL LAWRENCE	KY PIKE	NC MITCHELL	VA BLAND
AL PICKENS	KY POWELL	NC SWAIN	VA BUCHANAN
AL RANDOLPH	KY PULASKI	NC WATAUGA	VA DICKENSON
GA GILMER	KY ROCKCASTLE	NC YANCEY	VA LEE
GA TOWNS	KY ROWAN	OH ADAMS	VA RUSSELL
GA UNION	KY RUSSELL	OH JACKSON	VA SCOTT
KY ADAIR	KY WAYNE	OH MEIGS	VA WISE
KY BATH	KY WHITLEY	OH NOBLE	WV BARBOUR
KY BELL	KY WOLFE	OH PIKE	WV BOONE
KY BREATHITT	MD GARRETT	OH VINTON	WV BRAXTON
KY CARTER	MS ALCORN	TN BLEDSOE	WV CALHOUN
KY CASEY	MS BENTON	TN CAMPBELL	WV CLAY
KY CLAY	MS CALHOUN	TN CANNON	WV DODDRIDGE
KY CLINTON	MS CHICKASAW	TN CARTER	WV FAYETTE
KY CUMBERLAND	MS CHOCTAW	TN CLAIBORNE	WV GILMER
KY ELLIOTT	MS CLAY	TN CLAY	WV GRANT
KY ESTILL	MS KEMPER	TN COCKE	WV HAMPSHIRE
KY FLOYD	MS LOWNDES	TN CUMBERLAND	WV HARDY
KY HARLAN	MS MARSHALL	TN FENTRESS	WV LEWIS
KY JACKSON	MS MONROE	TN GRAINGER	WV LINCOLN
KY JOHNSON	MS NOXUBEE	TN GREENE	WV LOGAN
KY KNOTT	MS OKTIBBEHA	TN GRUNDY	WV MC DOWELL
KY KNOX	MS PONTOTOC	TN HANCOCK	WV MASON
KY LAUREL	MS PRENTISS	TN JACKSON	WV MINGO
KY LAWRENCE	MS TIPPAH	TN JOHNSON	WV MONROE
KY LEE	MS TISHOMINGO	TN MACON	WV NICHOLAS
KY LESLIE	MS UNION	TN MARION	WV PENDLETON
KY LETCHER	MS WEBSTER	TN MEIGS	WV POCAHONTAS

1970 Continued

WV PRESTON	WV ROANE	WV UPSHUR
WV RANDOLPH	WV SUMMERS	WV WEBSTER
WV RITCHIE	WV TUCKER	WV WIRT

1980 Distressed Counties (78)

AL LAWRENCE	KY LESLIE	MS MARSHALL	TN MONROE
AL PICKENS	KY LETCHER	MS NOXUBEE	TN MORGAN
GA UNION	KY LEWIS	MS OKTIBBEHA	TN OVERTON
KY ADAIR	KY LINCOLN	MS WINSTON	TN PICKETT
KY BATH	KY MC CREARY	NC GRAHAM	TN SCOTT
KY BELL	KY MAGOFFIN	NC MADISON	TN SEQUATCHIE
KY BREATHITT	KY MENIFEE	NC SWAIN	VA LEE
KY CARTER	KY MONROE	OH ADAMS	WV BARBOUR
KY CASEY	KY MORGAN	OH PIKE	WV BRAXTON
KY CLAY	KY OWSLEY	TN CAMPBELL	WV CALHOUN
KY CLINTON	KY POWELL	TN CLAIBORNE	WV CLAY
KY CUMBERLAND	KY PULASKI	TN CLAY	WV DODDRIDGE
KY ELLIOTT	KY ROCKCASTLE	TN COCKE	WV LINCOLN
KY ESTILL	KY RUSSELL	TN CUMBERLAND	WV MC DOWELL
KY HARLAN	KY WAYNE	TN FENTRESS	WV MINGO
KY JACKSON	KY WHITLEY	TN GRAINGER	WV SUMMERS
KY KNOTT	KY WOLFE	TN GRUNDY	WV WAYNE
KY KNOX	MS BENTON	TN HANCOCK	WV WEBSTER
KY LAWRENCE	MS CHOCTAW	TN JACKSON	
KY LEE	MS KEMPER	TN JOHNSON	

1990 Distressed Counties (106)

AL PICKENS	KY LAWRENCE	KY WAYNE	OH HARRISON
KY BATH	KY LEE	KY WHITLEY	OH JACKSON
KY BELL	KY LESLIE	KY WOLFE	OH LAWRENCE
KY BREATHITT	KY LETCHER	MS BENTON	OH MEIGS
KY CARTER	KY LEWIS	MS CHOCTAW	OH MONROE
KY CASEY	KY LINCOLN	MS CLAY	OH PIKE
KY CLAY	KY MC CREARY	MS KEMPER	OH SCIOTO
KY CLINTON	KY MAGOFFIN	MS MARSHALL	OH VINTON
KY CUMBERLAND	KY MARTIN	MS NOXUBEE	PA FAYETTE
KY ELLIOTT	KY MENIFEE	MS OKTIBBEHA	PA GREENE
KY ESTILL	KY MONROE	MS TISHOMINGO	TN CAMPBELL
KY FLOYD	KY MORGAN	MS WEBSTER	TN COCKE
KY HARLAN	KY OWSLEY	MS WINSTON	TN FENTRESS
KY JACKSON	KY PERRY	NC GRAHAM	TN HANCOCK
KY JOHNSON	KY PIKE	NC SWAIN	TN JOHNSON
KY KNOTT	KY POWELL	OH ADAMS	TN MORGAN
KY KNOX	KY ROCKCASTLE	OH ATHENS	TN SCOTT
KY LAUREL	KY ROWAN	OH GALLIA	VA BUCHANAN

1990 Continued

VA DICKENSON
VA LEE
VA RUSSELL
VA WISE
WV BARBOUR
WV BOONE
WV BRAXTON
WV CALHOUN
WV CLAY
WV DODDRIDGE
WV FAYETTE
WV GILMER
WV JACKSON
WV LEWIS
WV LINCOLN
WV LOGAN
WV MC DOWELL
WV MASON
WV MINGO
WV MONROE
WV NICHOLAS
WV POCAHONTAS
WV RALEIGH
WV RANDOLPH
WV RITCHIE
WV ROANE
WV SUMMERS
WV TAYLOR
WV UPSHUR
WV WAYNE
WV WEBSTER
WV WETZEL
WV WIRT
WV WYOMING

Distressed 1960 and 1990 (98)

AL PICKENS
KY BATH
KY BELL
KY BREATHITT
KY CARTER
KY CASEY
KY CLAY
KY CLINTON
KY CUMBERLAND
KY ELLIOTT
KY ESTILL
KY FLOYD
KY HARLAN
KY JACKSON
KY JOHNSON
KY KNOTT
KY KNOX
KY LAUREL
KY LAWRENCE
KY LEE
KY LESLIE
KY LETCHER
KY LEWIS
KY LINCOLN
KY MC CREARY
KY MAGOFFIN
KY MARTIN
KY MENIFEE
KY MONROE
KY MORGAN
KY OWSLEY
KY PERRY
KY PIKE
KY POWELL
KY ROCKCASTLE
KY ROWAN
KY WAYNE
KY WHITLEY
KY WOLFE
MS BENTON
MS CHOCTAW
MS CLAY
MS KEMPER
MS MARSHALL
MS NOXUBEE
MS OKTIBBEHA
MS TISHOMINGO
MS WEBSTER
MS WINSTON
NC GRAHAM
NC SWAIN
OH ADAMS
OH GALLIA
OH JACKSON
OH MEIGS
OH MONROE
OH PIKE
OH VINTON
PA FAYETTE
TN CAMPBELL
TN COCKE
TN FENTRESS
TN HANCOCK
TN JOHNSON
TN MORGAN
TN SCOTT
VA BUCHANAN
VA DICKENSON
VA LEE
VA RUSSELL
VA WISE
WV BARBOUR
WV BOONE
WV BRAXTON
WV CALHOUN
WV CLAY
WV DODDRIDGE
WV FAYETTE
WV GILMER
WV LINCOLN
WV LOGAN
WV MC DOWELL
WV MASON
WV MINGO
WV MONROE
WV NICHOLAS
WV POCAHONTAS
WV RALEIGH
WV RANDOLPH
WV RITCHIE
WV ROANE
WV SUMMERS
WV TAYLOR
WV UPSHUR
WV WAYNE
WV WEBSTER
WV WIRT
WV WYOMING

Distressed 1960, Not Distressed 1990 (116)

AL BIBB
AL BLOUNT
AL CHEROKEE
AL CHILTON
AL CLAY
AL CLEBURNE
AL COOSA
AL CULLMAN
AL DE KALB
AL ELMORE
AL FAYETTE
AL FRANKLIN
AL JACKSON
AL LAMAR
AL LAWRENCE
AL LIMESTONE
AL MARION
AL RANDOLPH
AL ST. CLAIR
AL SHELBY
AL TALLADEGA
AL WALKER
AL WINSTON
GA DADE
GA DAWSON
GA FANNIN
GA FRANKLIN
GA GILMER

Distressed 1960, Not Distressed 1990 Continued

GA HEARD	MS PONTOTOC	TN CLAY	TN UNION
GA LUMPKIN	MS PRENTISS	TN CUMBERLAND	TN VAN BUREN
GA MADISON	MS TIPPAH	TN DE KALB	TN WARREN
GA MURRAY	MS UNION	TN GRAINGER	TN WHITE
GA PICKENS	NC ALLEGHANY	TN GREENE	VA BATH
GA RABUN	NC ASHE	TN GRUNDY	VA BLAND
GA TOWNS	NC AVERY	TN HAWKINS	VA CARROLL
GA UNION	NC CHEROKEE	TN JACKSON	VA FLOYD
GA WHITE	NC CLAY	TN MC MINN	VA GRAYSON
KY ADAIR	NC JACKSON	TN MACON	VA HIGHLAND
KY FLEMING	NC MACON	TN MARION	VA SCOTT
KY GREENUP	NC MADISON	TN MEIGS	VA TAZEWELL
KY MADISON	NC MITCHELL	TN MONROE	VA WYTHE
KY PULASKI	NC POLK	TN OVERTON	WV GRANT
KY RUSSELL	NC WATAUGA	TN PICKETT	WV GREENBRIER
MD GARRETT	NC WILKES	TN POLK	WV HAMPSHIRE
MS ALCORN	NC YANCEY	TN PUTNAM	WV HARDY
MS CALHOUN	PA HUNTINGDON	TN RHEA	WV MERCER
MS CHICKASAW	TN BLEDSOE	TN SEQUATCHIE	WV MORGAN
MS ITAWAMBA	TN CANNON	TN SEVIER	WV PENDLETON
MS LOWNDES	TN CARTER	TN SMITH	WV PRESTON
MS MONROE	TN CLAIBORNE	TN UNICOI	WV TUCKER

Distressed 1960, 1970, 1980, 1990 (61)

AL PICKENS	KY LEE	MS BENTON	TN MORGAN
KY BATH	KY LESLIE	MS CHOCTAW	TN SCOTT
KY BELL	KY LETCHER	MS KEMPER	VA LEE
KY BREATHITT	KY LEWIS	MS MARSHALL	WV BARBOUR
KY CARTER	KY LINCOLN	MS NOXUBEE	WV BRAXTON
KY CASEY	KY MC CREARY	MS OKTIBBEHA	WV CALHOUN
KY CLAY	KY MAGOFFIN	MS WINSTON	WV CLAY
KY CLINTON	KY MENIFEE	NC GRAHAM	WV DODDRIDGE
KY CUMBERLAND	KY MONROE	NC SWAIN	WV LINCOLN
KY ELLIOTT	KY MORGAN	OH ADAMS	WV MC DOWELL
KY ESTILL	KY OWSLEY	OH PIKE	WV MINGO
KY HARLAN	KY POWELL	TN CAMPBELL	WV SUMMERS
KY JACKSON	KY ROCKCASTLE	TN COCKE	WV WEBSTER
KY KNOTT	KY WAYNE	TN FENTRESS	
KY KNOX	KY WHITLEY	TN HANCOCK	
KY LAWRENCE	KY WOLFE	TN JOHNSON	

Distressed Status of Counties Added to Region in FY 1999

Distressed 1960: Hale, AL; Macon, AL; Elbert, GA; Hart, GA; Yalobusha, MS
Distressed 1970: Hale, AL; Macon, AL; Elbert, GA; Yalobusha, MS
Distressed 1980: Hale, AL; Macon, AL
Distressed 1990: Macon, AL; Yalobusha, MS

Thus, based on ARC's current definitions and projecting back for all 406 counties in the region, the number of distressed counties by year was as follows:

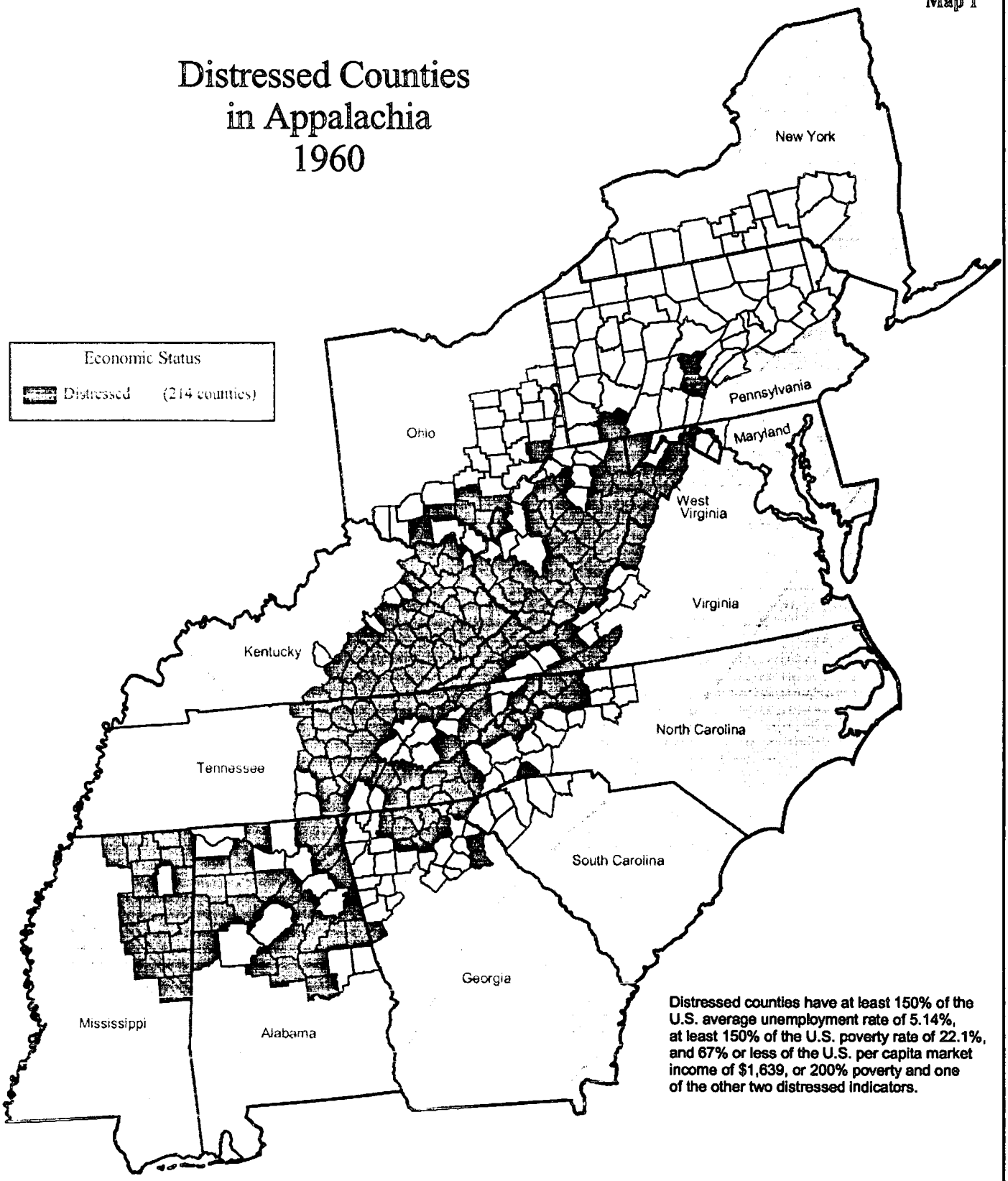
1960: 219
1970: 165
1980: 80
1990: 109

In FY 2000 there are 111 distressed counties in the currently defined ARC Region.

VII. Appendix B: Maps 1-8

Map 1

Distressed Counties in Appalachia 1960



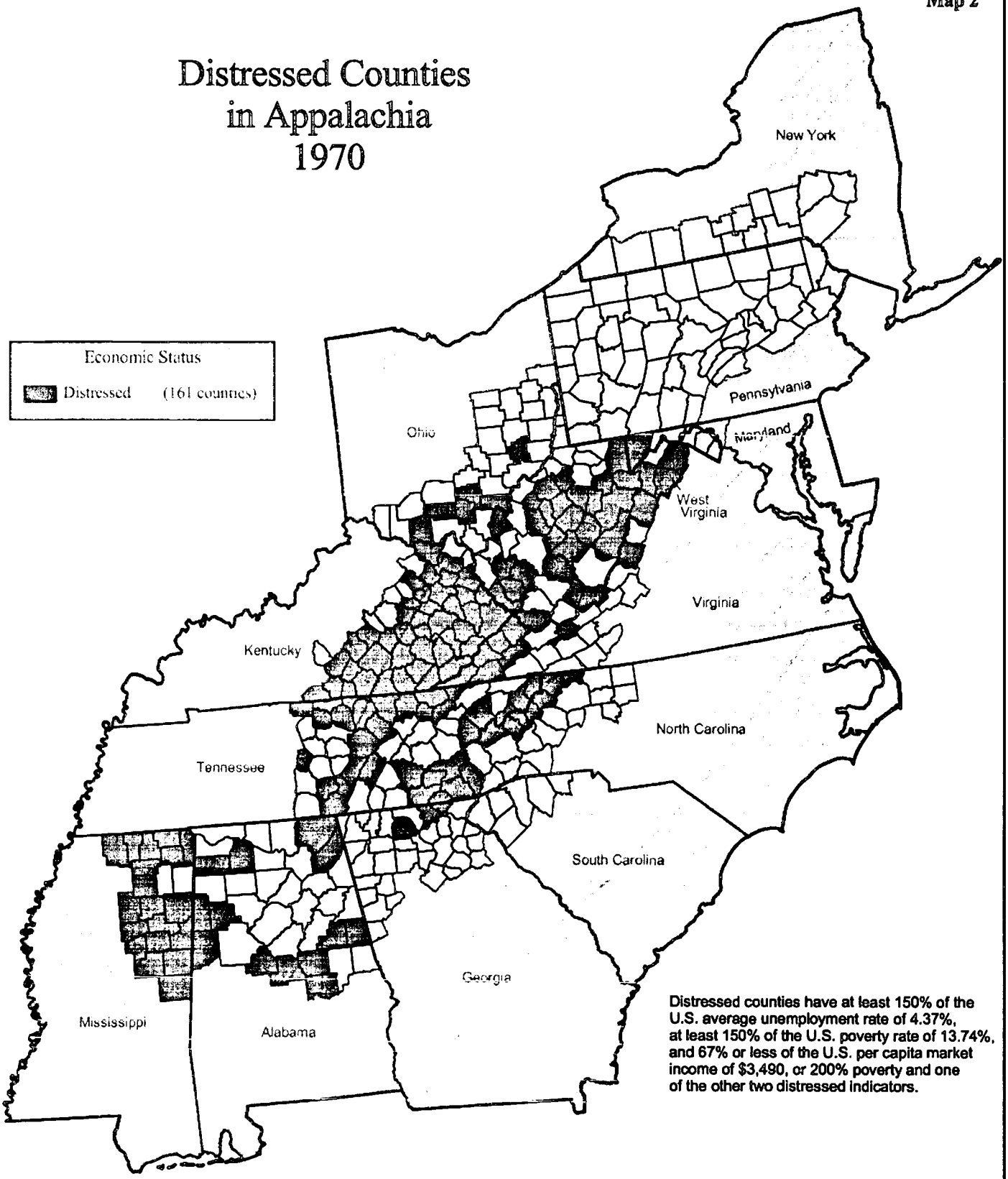
Distressed counties have at least 150% of the U.S. average unemployment rate of 5.14%, at least 150% of the U.S. poverty rate of 22.1%, and 67% or less of the U.S. per capita market income of $1,639, or 200% poverty and one of the other two distressed indicators.

ARC

Data Sources:
Unemployment: Census data from USDA, Economic Research Service (ERS), 1960;
Poverty: Office of Economic Opportunity data from USDA, ERS, 1960;
Income: U.S. Department of Commerce, Bureau of the Census, 1960.

Map 2

Distressed Counties in Appalachia 1970



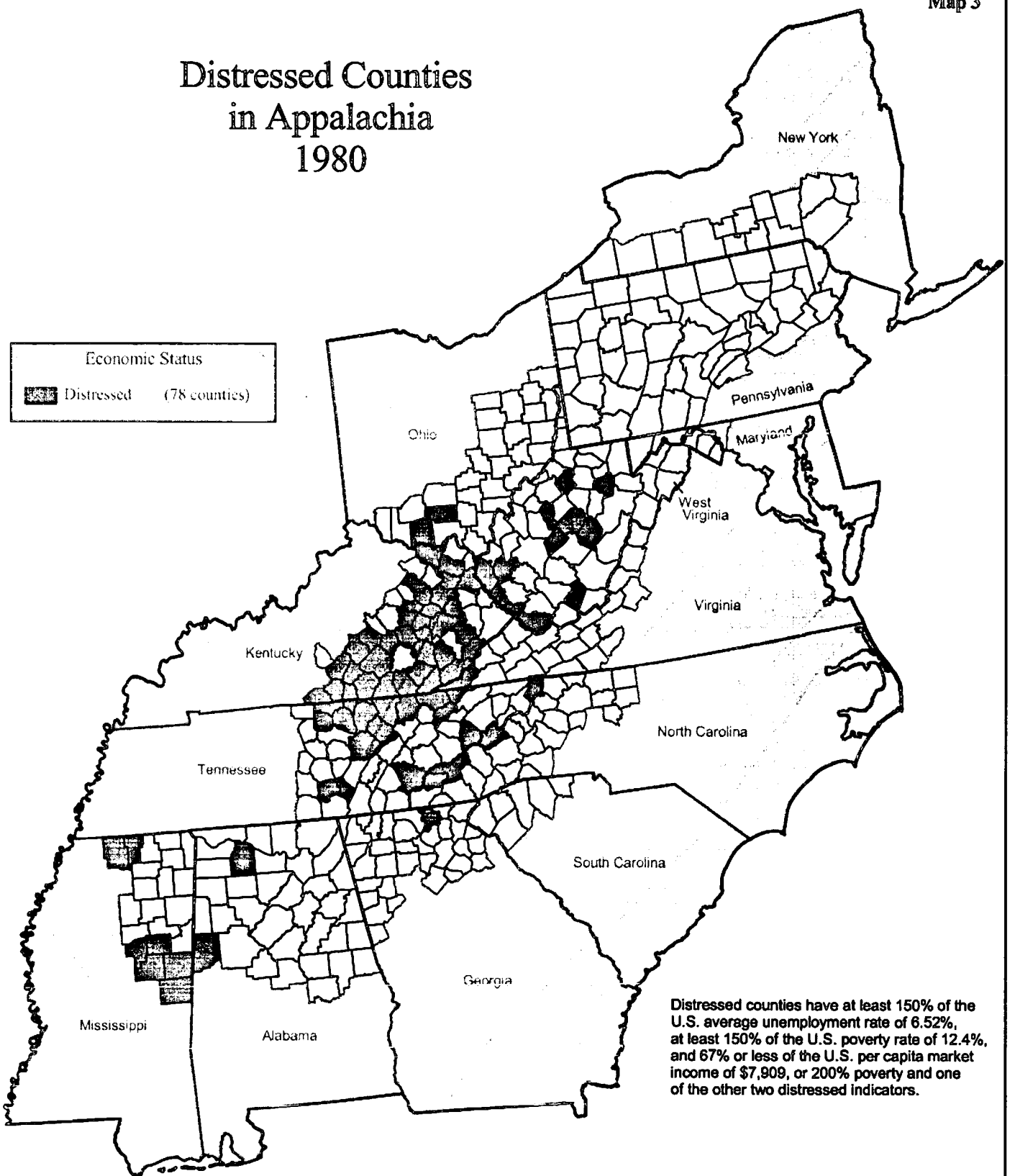
Distressed counties have at least 150% of the U.S. average unemployment rate of 4.37%, at least 150% of the U.S. poverty rate of 13.74%, and 67% or less of the U.S. per capita market income of $3,490, or 200% poverty and one of the other two distressed indicators.

ARC

Data Sources:
Unemployment: Census data from USDA, Economic Research Service (ERS), 1970;
Poverty: Census data from USDA, ERS, 1970;
Income: U.S. Department of Commerce, Bureau of Economic Analysis, 1970.

Map 3

Distressed Counties in Appalachia 1980



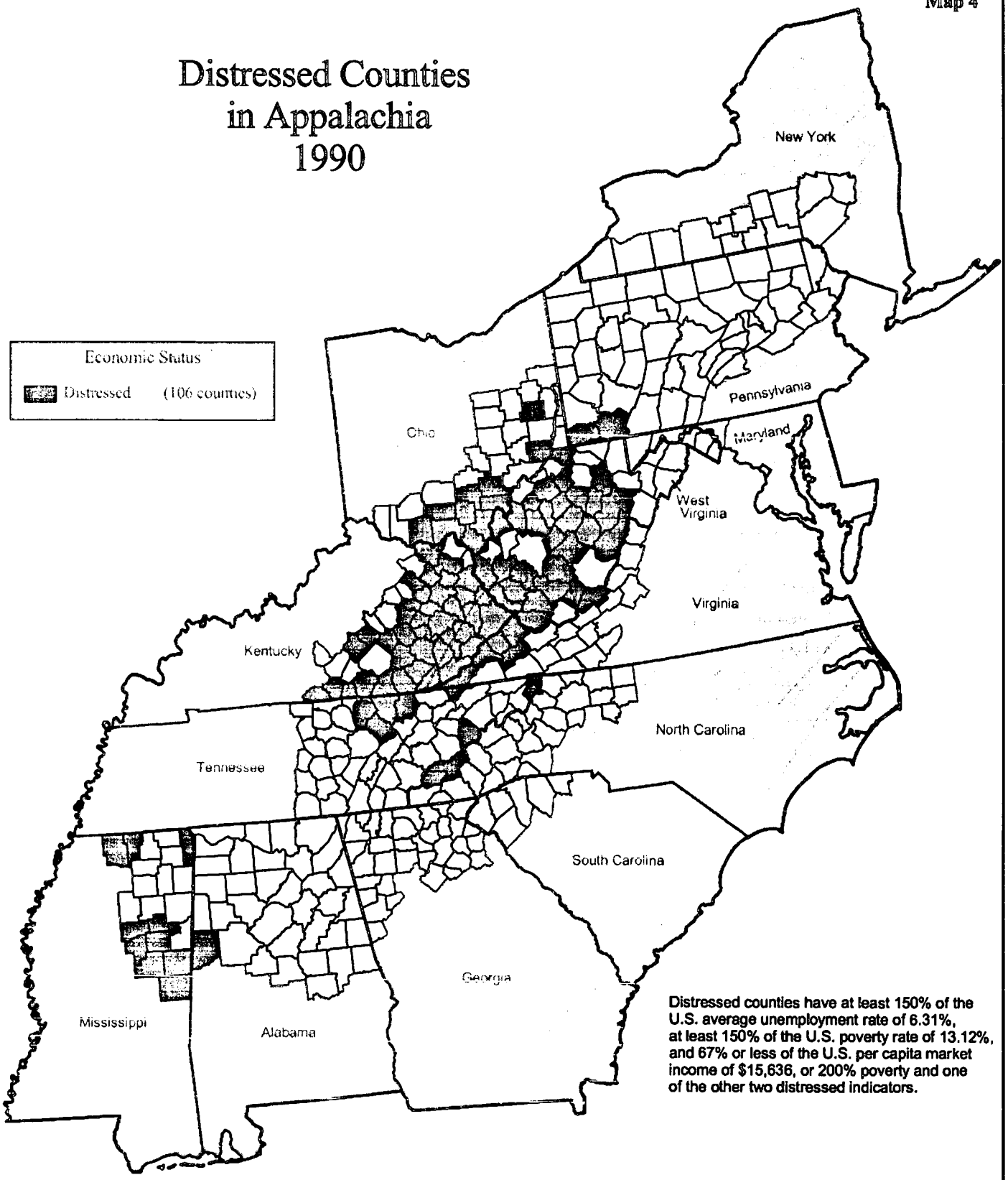
Distressed counties have at least 150% of the U.S. average unemployment rate of 6.52%, at least 150% of the U.S. poverty rate of 12.4%, and 67% or less of the U.S. per capita market income of $7,909, or 200% poverty and one of the other two distressed indicators.

ARC

Data Sources:
Unemployment: U.S. Department of Commerce, Bureau of the Census, 1980;
Poverty: U.S. Department of Commerce, Bureau of the Census, 1980;
Income: U.S. Department of Commerce, Bureau of Economic Analysis, 1980.

Map 4

Distressed Counties in Appalachia 1990



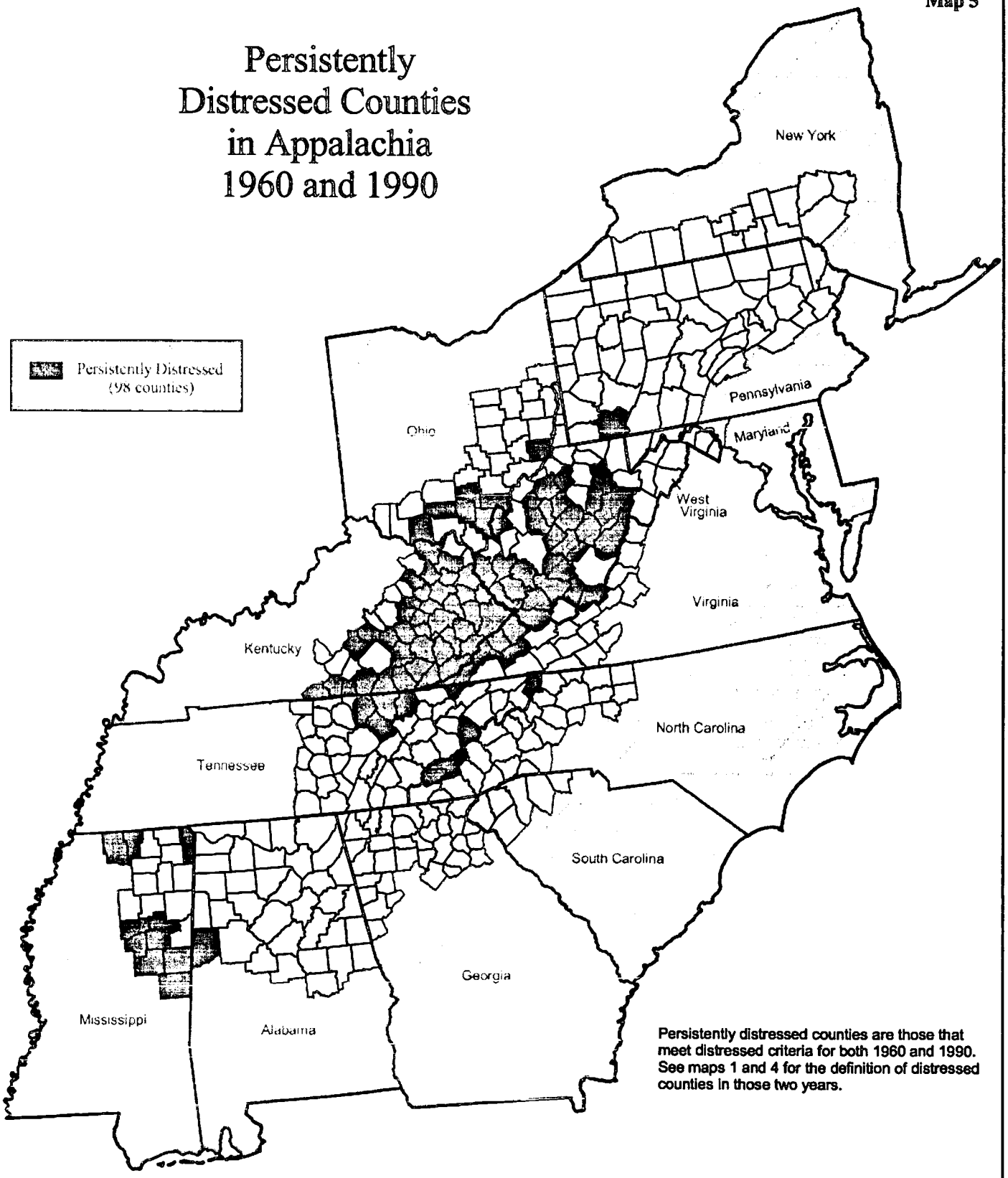
Distressed counties have at least 150% of the U.S. average unemployment rate of 6.31%, at least 150% of the U.S. poverty rate of 13.12%, and 67% or less of the U.S. per capita market income of $15,636, or 200% poverty and one of the other two distressed indicators.

ARC

Data Sources:
Unemployment: U.S. Department of Commerce, Bureau of the Census, 1990;
Poverty: U.S. Department of Commerce, Bureau of the Census, 1990;
Income: U.S. Department of Commerce, Bureau of Economic Analysis, 1990.

Map 5

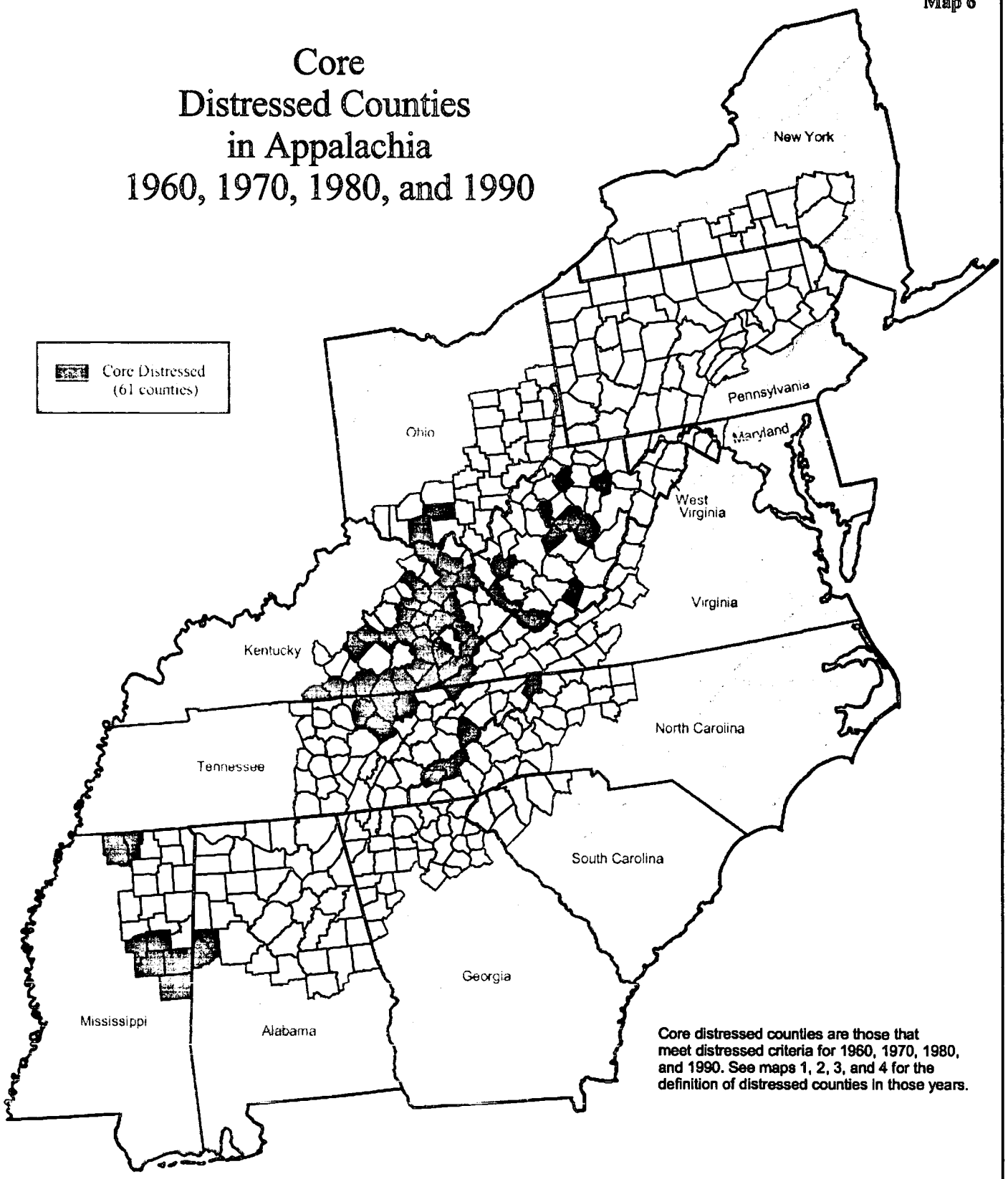
Persistently Distressed Counties in Appalachia 1960 and 1990



Persistently distressed counties are those that meet distressed criteria for both 1960 and 1990. See maps 1 and 4 for the definition of distressed counties in those two years.

Map 6

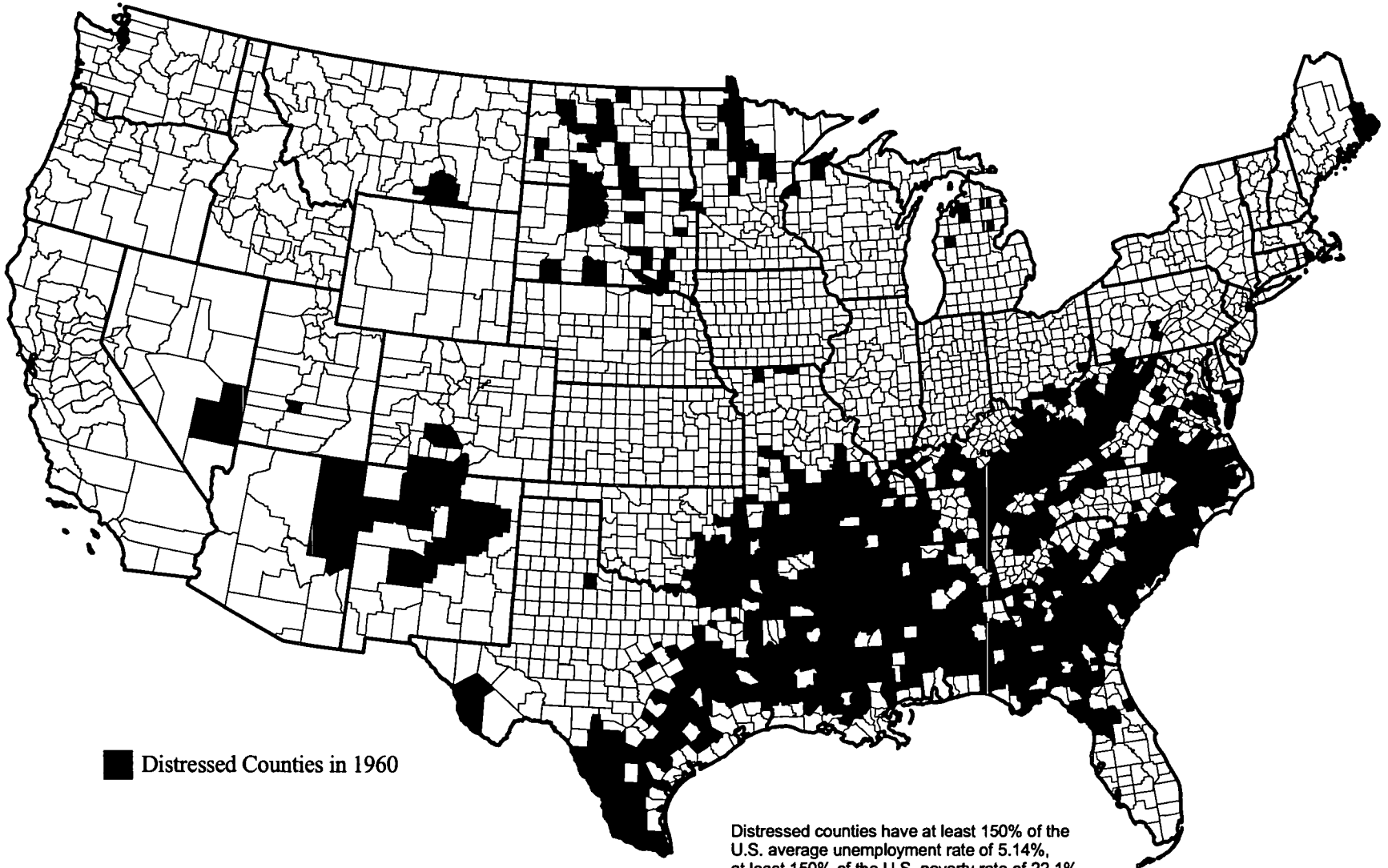
Core Distressed Counties in Appalachia 1960, 1970, 1980, and 1990



Core distressed counties are those that meet distressed criteria for 1960, 1970, 1980, and 1990. See maps 1, 2, 3, and 4 for the definition of distressed counties in those years.

Map 7

Distressed Counties in the United States, 1960

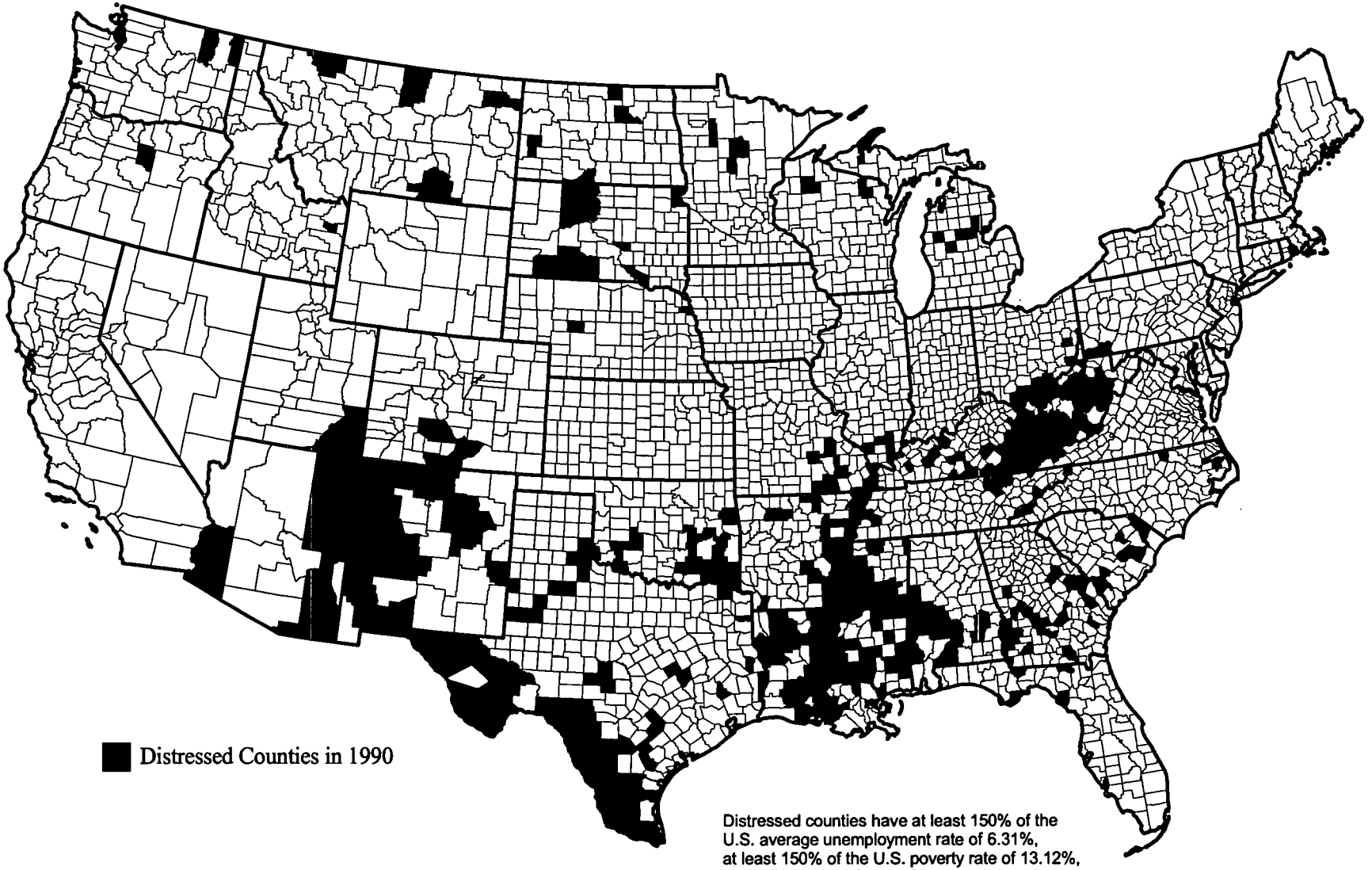


Distressed counties have at least 150% of the U.S. average unemployment rate of 5.14%, at least 150% of the U.S. poverty rate of 22.1%, and 67% or less of the U.S. per capita market income of $1,639, or 200% poverty and one of the other two distressed indicators.

ARC

Data Sources:
Unemployment: Census data from USDA, Economic Research Service (ERS), 1960;
Poverty: Office of Economic Opportunity data from USDA, ERS, 1960;
Income: U.S. Department of Commerce, Bureau of the Census, 1960.

Distressed Counties in the United States, 1990



Distressed counties have at least 150% of the U.S. average unemployment rate of 6.31%, at least 150% of the U.S. poverty rate of 13.12%, and 67% or less of the U.S. per capita market income of $15,636, or 200% poverty and one of the other two distressed indicators.

ARC

Data Sources:
Unemployment: U.S. Department of Commerce, Bureau of the Census, 1990;
Poverty: U.S. Department of Commerce, Bureau of the Census, 1990;
Income: U.S. Department of Commerce, Bureau of Economic Analysis, 1990.

VIII. Appendix C: Research Methodology

Distress Indicators

This report uses the ARC's current distress standards to determine the number of distressed counties in both Appalachia and the entire nation in 1960, 1970, 1980, and 1990. Data to determine distress are drawn from the U.S. Census, the Bureau of Economic Analysis, and the Office of Economic Opportunity. The indicators used in this research are the same as the indicators that the ARC currently uses to determine distress with one exception: unemployment rates are not calculated for three-year periods. Instead, this research calculates unemployment only for the census years, primarily because it is difficult to get accurate and consistent county-level data for unemployment for the years surrounding the 1960 census. Further information about data used in this analysis is included in Appendix D.

Methodology used to determine distressed standards

Raw totals were calculated for each of the variables. For example, the total number of civilian unemployed in any given year was calculated, as was the total number of people in the civilian labor force. National averages were then determined using these total figures; for example, for unemployment the number of unemployed would be the numerator and the civilian labor force the denominator.

Distressed standards were determined by the following calculations:

Poverty 200%: National Average x 2
Poverty 150%: National Average x 3/2
Unemployment 150%: National average x 3/2
PCMI: National Average x 2/3

National Averages and Distressed Standards (in parentheses) for each of the years are as follows:

1960 National Averages
Per Capita Market Income - $1,639.22 ($1,092.81)
Unemployment Rate – 5.14% (7.71%)
Poverty Rate – 22.10 (33.15%; 44.20%)

1970 National Averages
Per Capita Market Income - $3,490.37 ($2,326.91)
Unemployment Rate – 4.37% (6.55%)
Poverty Rate – 13.74% (20.61%; 27.48%)

1980 National Averages
Per Capita Market Income - $7,909.17 ($5,272.78)
Unemployment Rate – 6.52% (9.78%)
Poverty Rate – 12.40 (18.60%; 24.80%)

1990 National Averages
Per Capita Market Income - $15,635.85 ($10,423.90)
Unemployment Rate – 6.31% (9.47%)
Poverty Rate – 13.12% (19.68%; 26.24%)

Statistical Analyses

To determine factors associated with counties either remaining distressed or moving out of distressed status, this research uses data from the 1960 and 1990 U.S. Censuses as well as the U.S. Department of Agriculture's Economic Research Service (ERS). A more detailed description of all of the variables used in this

analysis is included in Appendix D. Determining factors associated with distress is somewhat limited by the lack of consistent and available data over time. Nonetheless, a reasonable and fairly consistent set of variables is available from both the 1960 and 1990 censuses, and it is believed that this report's analysis of such variables provides a decent indication of factors associated with distress.

Two types of statistical methods are used to determine factors associated with distress. First, a statistical technique called logistic regression analysis is used to predict the relationship between a single "dependent" variable and multiple "independent" variables. The independent variables are used to predict the presence or absence of a characteristic or outcome, which in this case is the presence or absence of economic distress. The logistic regression techniques used in this analysis are a means of testing the probability of a county remaining or moving out of distressed status given a set of social, demographic, or economic factors or conditions.[71] Each independent variable entered into the equation is assigned different levels of significance in its ability to predict the outcome, but its ability to predict such outcome should be understood only as its ability to do so in the context of all of the variables used in the equation.

In this analysis, variables that are significant at a rate of less than 0.05 are considered significant contributors to a county's distressed status. R values provide a means for determining an independent variable's contribution to the outcome relative to the other variables in the equation. R values demonstrate either a positive or negative association with an outcome, and variables that have R values with higher absolute values (either positive or negative) contribute more to the outcome than variables whose R values have lower absolute values. This analysis employed two logistic regression models.

As mentioned in the literature, two models are used in this analysis. One can generally be referred to as the socioeconomic model. This model includes mostly census information, and most of the variables are at the ratio scale. The other model, referred to as the economic structure model, uses variables from the ERS, most of which are nominal. It is believed that, considered in combination, these models give an adequate indication of factors associated with counties being able to move out of distress or remaining distressed during the period studied.

The independent variables included in the equations were not randomly selected. Instead, they were assumed to have a potentially significant correlation with distressed status; the selection of such variables was based largely upon variables used in previous analyses that have attempted to measure factors associated with county-level socioeconomic conditions.[72] Furthermore, a scatterplot procedure was used to screen the independent variables for collinearity, and highly correlated variables were not included in the equations. In general, it was believed that most of the independent variables entered into these equations, which generally all related to social, demographic, and economic factors, would have either a positive or negative effect on a county's distressed status. While most of the variables in the equations are self-explanatory, it should be noted that high school education is used as a proxy for educational attainment rates, and the percentage of the population below 19 is considered a proxy for age distribution. There are a variety of embedded hypotheses, such as higher rates of educational attainment will lead to lower chances of a county being distressed, or that a county being located in the southern part of the Appalachian Region is more likely to have moved out of distress. The results of the logistic regression models are included below.

Other statistical techniques used in this analysis include comparisons of means, *t*-tests, and chi-square tests. The arithmetic mean is simply a measure of average. *T*-tests and chi-square tests are used to test for statistically significant differences between groups. A nonsignificant *t*-test or chi-square test indicates that the samples are from identical populations, while significant *t*-tests and chi-square tests indicate that the samples are from different populations.[73] For example, if a *t*-test indicates that the rates of educational attainment for two groups of counties, such as persistently distressed counties and counties that have moved out of distress, are significantly different, then it can be stated that the rates of educational attainment in those counties have been statistically proven to be different. *T*-tests are used for ratio or interval data, while chi-square tests are used for nominal data.

Results of Logistic Regression Models

Model 1 (Socioeconomic Model)
Dependent Variable: Distressed County 1960 and 1990
Initial -2 Log Likelihood : 295.15118
Method: Forward Stepwise (Conditional)
Final -2 Log Likelihood: 125.538
Nagelkerke R-squared value: 0.732

Classification table	Total	Predicted	Percent Correct
Distressed 1960/1990	98	86	87.76%
Distressed 1960/Not 1990	116	102	87.93%
Total	214	188	87.85%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
% Urban Pop.	-0.0381	0.0161	5.6299	1	0.0177	-1109	0.9626
High School Education	-0.1074	0.0401	7.1665	1	0.0075	-0.1323	0.8981
% Manufacturing	-0.1168	0.0291	16.0615	1	0.0001	-0.2183	0.8898
% 19 + Below	0.4084	0.1323	9.5296	1	0.0020	0.1597	1.5044
% Nonwhite	0.0920	0.0311	8.7613	1	0.0031	0.1514	1.0964
South Sub-Region	-2.9334	0.6492	20.3145	1	0.0000	-0.2498	0.0532
Constant	-1.8112	5.0936	0.1264	1	0.7221		

Variables Not in the Equation

Pct. Mining	Fed/ADHS Highway	Metro Adj.	Central Sub-Reg.
Pct. Services			

Model 2 (Economic Structure Model)
Dependent Variable: Distressed County 1960 and 1990
Initial -2 Log Likelihood : 295.15118
Method: Forward Stepwise (Conditional)
Final -2 Log Likelihood: 233.571
Nagelkerke R-squared value: .334

Classification Table	Total	Predicted	Percent Correct
Distressed 1960/1990	98	76	77.55%
Distressed 1960/Not 1990	116	74	63.79%
Total	214	150	70.09%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
Mining Dependent	2.1246	0.5940	12.7940	1	0.0003	1912	8.3699
Manuf. Dependent	-0.9510	0.3701	6.6004	1	0.0102	-0.1248	0.3864
Govt. Dependent	1.0239	0.5762	3.1573	1	0.0756	0.0626	2.7840
Retire Destination.	-2.1150	0.8217	6.6249	1	0.0101	-1252	0.1206
Beale 2	-2.0206	0.7920	6.5093	1	0.0107	-0.1236	0.1326
Constant	0.0057	0.2462	0.0005	1	0.9814		

Variables Not in the Equation

Serv. Dep.	Com. Dep.	Beale 5	Beale 8
Nonspecialized	Beale 3	Beale 6	Beale 9
Fed. Lands Dep.	Beale 4	Beale 7	

IX. Appendix D: Information About Data Used in This Analysis

(For full references see the bibliography.)

Data for Distressed Variables

Unemployment

1960, 1970: Census data from the USDA Economic Research Service (ERS)
1980, 1990: Census data from "USA Counties 1996" CD

Note: "Civilian labor force" and "unemployed civilian labor force" were used to determine unemployment. The ARC bases its distressed indicator on civilian unemployment.

Poverty

1960*: Office of Economic Opportunity (OEO) data from the ERS
1970: Census data from the ERS
1980, 1990: Census data from "USA Counties 1996" CD

** The census did not measure poverty before 1960. The OEO rates of poverty are considered comparable to the census' measures of poverty.*

Income

1960: U.S. Bureau of the Census

Note: In 1960, the census determined three types of income: wage and salary income; self-employment income; and other income. In this analysis, "other income" was used as the proxy for transfer payments. Thus, 1960 PCMI was wage and salary income plus self-employment income.

1970, 1980, 1990: Bureau of Economic Analysis (BEA) data from the 1996 REIS CD

Note: The BEA income data are considered more accurate than the census data for income. Because census data are actually from the year preceding the census (e.g., 1970 census data is actually from 1969), 1969, 1979, and 1989 BEA data were used in this analysis. BEA data were not available for years preceding 1969. To determine PCMI, Transfer Payment Income was subtracted from Total Per Capita Income.

Other Variables Used in the Analysis

1960 Population (age, race, etc.); 1960 Urban Population; 1960 Educational Attainment;* 1960 Employment by Industry**: Census file tapes, data from the USDA Economic Research Service (ERS)

1990 Population (age, race, etc.); 1990 Urban Population; 1990 Educational Attainment;* 1990 Employment by Industry**: USA Counties 1996. U.S. Department of Commerce, Bureau of the Census

** Population 25 years and older with 12 or more years of education and population 25 years and older with some college were used to assess educational attainment.*

*** Rates were for employed persons by industry; the following were aggregated and considered as services: Transportation, Communications, and Other Public Utilities; Wholesale and Retail Trade; Finance, Insurance, and Real Estate; Business and Repair Services; Personal, Entertainment, and Recreation Services; Professional and Related Services; and Public Administration.*

ARC Subregion; ADHS and Federal Highways in County: Data from the ARC

Economic Research Service Variables

The ERS, a branch of the United States Department of Agriculture (USDA), has developed a rural typology that provides a way to identify what it considers important economic and policy characteristics of nonmetropolitan counties. The ERS and other entities in rural policymaking use the typology. Nonmetro counties are classified as one of six non-overlapping economic types (farming-dependent, mining-dependent, manufacturing-dependent, government-dependent, services-dependent, and nonspecialized). Counties are also classified into five overlapping policy types (retirement-destination, federal lands, commuting, persistent poverty, and transfer-dependent; note that persistent poverty and transfers-dependent were not used in this analysis because it was assumed that they would be highly correlated with the distressed indicator).

Farming-dependent: Farming contributed a weighted annual average of 20 percent or more of total labor and proprietor income over the 3 years from 1987 to 1989.

Mining-dependent: Mining contributed a weighted annual average of 15 percent or more of total labor and proprietor income over the 3 years from 1987 to 1989.

Manufacturing-dependent: Manufacturing contributed a weighted annual average of 30 percent or more of total labor and proprietor income over the 3 years from 1987 to 1989.

Government-dependent: Government contributed a weighted annual average of 25 percent or more of total labor and proprietor income over the 3 years from 1987 to 1989.

Services-dependent: Service activities (private and personal services, agricultural services, wholesale and retail trade, finance and insurance, transportation and public utilities) contributed a weighted annual average of 50 percent or more of total labor and proprietor income over the 3 years from 1987 to 1989.

Nonspecialized: Counties not classified as a specialized economic type over the 3 years from 1987 to 1989.

Retirement-destination: The population age 60 years and over in 1990 increased by 15 percent or more during 1980-90 through inmovement of people.

Federal lands: Federally owned lands made up 30 percent or more of a county's land area in the year 1987.

Commuting: Workers age 16 years and over commuting to jobs outside their county of residence were 40 percent or more of all the county's workers in 1990.

The ERS also uses what it terms rural-urban continuum codes to classify metro and nonmetro counties. These codes were used to determine the metropolitan status as well as the metropolitan adjacency status of ARC counties. The codes are as follows:

Metro
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
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 less than 2,500 urban population, adjacent to a metro area
9 - Completely rural or less than 2,500 urban population, not adjacent to a metro area

Notes

[1] For information concerning the early policies of the ARC, see ARC 1968 and ARC 1970. For information about the Distressed Counties Program, see ARC 1981b and ARC 1982.

[2] See Fullenbaum and Mariana McNeill, 1995.

[3] See Couto, pp. 41-69.

[4] See Freme, Frederick L., and B.D. Hong. *US Coal Supply and Demand: 1998 Review*. Dept. of Energy, Energy Information Administration, 1998. Department of Energy's *Annual Energy Outlook 1999*, Washington DC, Report # DOE/EIA-0383(99). Bhatt, Suresh K. Appalachian Coal: An Overview. *Mining Engineering*, December 1995. Truman, Jim. Appalachian Coal Markets. *Mining Engineering*, December 1995.

[5] For an analysis of national trends contributing to growing income and wage inequality see James Galbraith 1998; for an analysis of Appalachian trends on inequality see McLaughlin et al. 1999, pp. 160-171. **[not in bibliography; please provide a bibliography entry.]**

[6] Based upon a range of resources, including Arthur D. Little 1982; Jensen 1998; Papadimitriou 1999; Raitz and Ulack 1984; and Rothblatt 1971.

[7] These calculations were based on Historical Tables of the Budget of the United States Government, Fiscal Year 1999, Office of Management and Budget Federal Budget, Tables 3.2 and 11.3. Poverty expenditures included expenditures by the federal government in more than 20 general categories and community and regional development. All expenditures were deflated using FY 1992 dollars as a basis as derived from table 10.1. The calculations were done from 1962-2000 to correspond, for the most part, with the time period studied in this report.

[8] Ibid, Table 3.2.

[9] See Couto, pp. 24-29; 32-39; 44-64, for a discussion the impact of these policy changes on industry in the Appalachian Region. For a discussion of the national policy changes and implications for employment policy, income inequality, and impacts on cyclical growth see Galbraith 1998, especially chapters 8 and 10.

[10] A report to the Commission (Arthur D. Little 1982) indicated that such expenditures were lower in the early 1980s, while Rothblatt 1971 claims that federal expenditures have historically been lower in Appalachia. A more detailed analysis of federal expenditures per capita would be necessary to clearly indicate such trends.

[11] In general, it is believed that Appalachia has historically been a lagging region, and this research gives the same indication. For other sources, see the PARC report (1964), which discusses Appalachian economic and social conditions compared with the rest of the nation in the 1960s. Bradshaw 1992, p. 29, suggests that in the 1960s "Appalachia clearly lagged economically behind the rest of the United States; it had social problems resulting from isolation and outmigration; its political processes tended to hold back modernization; and its environment was deteriorating. For further references to Appalachia's lagging conditions see Munro 1969, p. 149, Rothblatt 1971, p. 1, and Moore 1994, p. 316. It is important to note that some writers take issue with Appalachia being referred to as a "lagging" region. See, for example, Whisnant 1980.

[12] PARC 1964, p. XV.

[13] Rothblatt 1971, p. 5.

[14] Congressional Record 1960.

[15] Hansen et al. 1990, pg. 123; Moore 1994, p. 320.

[16] Bradshaw 1992, p. 31.

[17] PARC 1964, p. II.

[18] PARC 1964, pp. 1-18.

[19] ARC 1965, pp. 2-32.

[20] Widner 1990, p. 299.

[21] ARC 1997. Other federal agencies have contributed approximately 10% to the total of $15 billion.

[22] ARC 1997.

[23] ARC 1968; ARC 1970. These documents indicate the parameters of the ARC's growth center policy.

[24] ARC 1965, p. 1.

[25] Preston 1971.

[26] Preston 1971 discusses the ARC's growth center strategy and its relation to prevalent regional development theories of the times. For further readings on such theory, see Friedmann 1964 and Hirschman 1958.

[27] The ARC's growth center policy was not completely congruent with much of the growth policy theory expressed in the academic literature of the times. In many ways, it was very different. Nonetheless, through the first five years of the program approximately 60% of all area development funds went to ARC-designated growth centers (ARC 1970), and the Appalachian Development Highway System was in many ways designed to link the Region's growth centers with each other and with urban centers just outside of the region.

[28] There is no written documentation that the ARC officially abandoned the policy of developing growth centers. However, Thoman 1976, pp. 24-26, suggests that by the mid-1970s the ARC no longer strictly supported such a policy, and Bradshaw 1992 suggests in various parts of his book the political difficulties the ARC had in implementing such a policy. Rothblatt 1971 discusses the political difficulties with implementing such a policy.

[29] ARC 1981a.

[30] ARC 1981a, p. 5.

[31] ARC 1981a, p. 39.

[32] ARC Resolution #538, July 28, 1982.

[33] ARC Resolution #583, February 22, 1987.

[34] ARC Resolution #624, July 19, 1994.

[35] ARC Resolutions #635 & 636, August 20, 1996, and ARC Code Revisions, March 1997. The ARC currently designates counties as either distressed, transitional, competitive, or attainment. Distressed counties are eligible for 80 percent funding by the ARC, transitional 50 percent, and competitive 30 percent, and attainment counties are not eligible for ARC funds unless they are part of a multi-county project.

[36] Glasmeier and Fuellhart 1999, p. 2.

[37] ARC 1989b.

[38] ARC 1989b, p. 2.

[39] This is based upon expenditures taken from the ARC's 1997 Annual Report. All expenditures are deflated to FY 1992 dollars.

[40] ARC 1989b; The ARC currently designates counties as either distressed, transitional, competitive, or attainment. Distressed counties are eligible for 80 percent funding by the ARC, transitional 50 percent, competitive 30 percent, and attainment counties are not eligible for ARC funds unless they are part of a multi-county project.

[41] ARC 1989a; ARC 1995a.

[42] ARC project data file. The single-county distressed grants includes $31 million for the Ritchie Dam project, which if excluded would bring the total to $235 million.

[43] Ibid.

[44] Fullenbaum and McNeill 1995.

[45] Gauthier 1973; Munro 1969; Whisnant 1980.

[46] Isserman 1996b; Isserman and Rephann 1995; Moore 1994.

[47] Glasmeier and Fuellhart 1999.

[48] For total number of distressed counties including the current total of 406 distressed counties, see Appendix A.

[49] Isserman 1996a; Isserman 1996b; Isserman and Rephann 1995; Widner 1990.

[50] The improvement in the Southern United States is well-documented. See Hoover and Giarratani 1984 or Raitz and Ulack 1984 for further reference.

[51] Raitz and Ulack 1984.

[52]Jensen 1998.

[53] Jensen 1998.

[54] Hansen 1971 wrote much about the demographic spillover effects and the potential for growth of intermediate-sized cities.

[55] www.eia.doe.gov

[56] For additional analysis of the socioeconomic trends in the Mississippi Delta Region see Isserman 1997.

[57] Raitz and Ulack 1984; Widner 1990.

[58] Harrison and Bluestone 1982 and 1988 and Jensen 1998.

[59] Harrison and Bluestone 1982 and 1988; Herzenberg, Alic and Wial 1998; Neill 1997.

[60] Galbraith 1998; Harrison and Bluestone 1988; Herzenberg, Alic and Wial 1998; Neill 1997.

[61] The socioeconomic model had a prediction rate of 88 percent, while the economic base model had a prediction rate of 71 percent.

[62] It is important to note that there is a difference between the definition of metro and urban, or rural and nonmetro. A nonmetro county can actually have a high percentage of people living in urban areas. The calculations in this study indicate that counties with a greater percentage of the population living in urban areas are more likely to emerge from distress. Thus, nonmetro and nonmetro adjacent counties with low percentages of the population living in urban areas would probably have a difficult time emerging from distress.

[63] Readers may note that in the *socioeconomic logistic regression model* "percent mining" was not significant while in the *economic structure logistic regression model* "mining dependency" was significant. A number of reasons may help explain why this might have occurred. First, in screening the variables for collinearity, it was found that percent mining and percent manufacturing were inversely correlated (-.56). Another reason for the apparent discrepency between the two models may be that in the socioeconomic model percent employed in mining was a contiuous variable while in the Economic Structure model it was a binary variable.

[64] See the county economic typology of the Economic Research Service, 1995.

[65] Johnson, Kraybill and Deaton 1989 cited in Galston and Baehler 1995.

[66] Porterfield 1990 cited in Galston and Baehler 1995.

[67] U.S. Census Bureau: www.census.gov/hhes/income/midclass/midclsan.html (last revised Feb. 3, 1999). Also see Center on Budget and Policy Priorities 1998, p. 2.

[68] These findings are based on a forthcoming study conducted for ARC by the Educational Testing Service.

[69] These estimates for IT employment were derived by ARC using the REMI model for the 406-county Appalachian region. The REMI model is a proprietary model developed by Regional Economic Models Inc. of Amherst, Mass.

[70] Real spending trends for total federal economic development outlays were derived from Table 3.2 for Budget Function 450 less Disaster Relief as reported in the *Historical Tables of the Budget of the United States Government for Fiscal Year 1999*. Figures were expressed in 1992 dollars using the deflators reported in Table 10.1 using the total nondefense deflator.

[71] For an even more detailed description of logistic regression, see SPSS 1997.

[72] Glasmeier and Fuellhart 1999; Kusmin 1994; Kusmin, Redman and Sears 1996.

[73] For a further description of *t*-tests as well as chi-square tests see Ebdon 1985.

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