

# **AN ASSESSMENT OF LABOR FORCE PARTICIPATION RATES AND UNDEREMPLOYMENT IN APPALACHIA**

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## EXECUTIVE SUMMARY

Conventional unemployment rates provide an incomplete measure of local labor market conditions, especially in poor rural regions. Unemployment does not include involuntary part-time workers; nor does it include discouraged workers who stop seeking work because they cannot find jobs. In addition, unemployment does not gauge the size of the underground or “informal” economy – as evidenced by the fact that some developing countries have low official unemployment rates.

To help get a more complete picture of local labor markets in Appalachia, the Appalachian Regional Commission (ARC) Region commissioned this study to generate county-level measures of *labor force participation* and *underemployment* rates. Both labor force participation and underemployment are broader measures of labor market surplus than unemployment. The underemployed include discouraged and involuntary part-time workers. Labor force participation rates are also sensitive to the number of workers who are discouraged or who participate only in the underground economy.

### **Underemployment and labor force participation rates both reveal better than unemployment the higher degree of labor market surplus in Appalachia compared to the United States as a whole.**

- In 1998, evaluated by the unemployment rate, Appalachian labor market performance was similar to that for the nation as a whole – 4.8 percent versus 4.6 percent.
- By contrast, the Appalachian underemployment rate equaled 10 percent, substantially above the U.S. rate of 8.6 percent.
- The labor force participation rate in Appalachia stood at 62 percent in 1998, six percentage below the U.S. rate of 68 percent.

After estimating labor force participation and underemployment rates at the county level, we combined them into a larger data base that also included wages, unemployment, and proprietorship; industry shares of employment; other variables characterizing the county economic base; geography (e.g., relationship to a metropolitan area); and past economic performance. For the years 1993 to 1998, each variable was generated for all 406 Appalachian counties and a wide variety of county groupings. This permitted us to examine time trends in each variable and differences in both levels of and changes in variables among the various county groups.

**Over the 1993 to 1998 period, underemployment and labor force participation improved a bit more slowly in Appalachia than in the nation as a whole**, and unemployment at the same rate. Job growth was lower and wage growth a little smaller than in the entire United States.

### **Appalachia’s slightly below average performance reflected labor market experience in the region’s more depressed regions.** For example,

- underemployment and unemployment were highest and declined the least in Central Appalachia;
- the 117 Appalachian counties that were defined as economically “distressed” prior to 1993 – because of high rates of poverty and unemployment plus low per capita income – experienced less improvement in labor market indicators than non-distressed counties;
- Appalachia’s 293 non-metropolitan counties had lower levels of labor market performance in 1993 and experienced substantially smaller drops in unemployment and underemployment by 1998 than the 109 metropolitan counties; and
- while counties in or near metropolitan areas fared the best, the poorest and most rural counties furthest from metropolitan areas generally fared the worst.

The economic polarization observed, even in a time of prosperity, provides reason to worry about Appalachia’s less robust regions should the economy turn down.

With an eye to how policymakers and practitioners might promote economic development in Appalachia, we also examined how the Region's sectoral composition and economic base correlated with labor market experience. Our economic base analysis shows the following.

- *The small number of farming-dependent non-metropolitan counties in Appalachia have experienced rising unemployment and underemployment while virtually all other groups of counties show falling joblessness.*
- *A mixed picture emerges with respect to manufacturing.*
  - Manufacturing has historically been a common route to development, particularly in Southern Appalachia. Reflecting this, Southern Appalachian manufacturing accounts for 20 percent of total regional employment, compared to only 14 percent for Central and Northern Appalachia (and 12 percent in the United States).
  - In some parts of Appalachia, manufacturing still contributes to economic success. For example, three of the 10 Appalachian local development districts with the lowest underemployment in 1998 had unusually high proportions of manufacturing.
  - At the same time, signs exist of vulnerability within Appalachian manufacturing. Employment in Southern Appalachian manufacturing declined by 10 percent from 1993 to 1998. In manufacturing-dependent non-metropolitan Appalachian counties, the manufacturing employment share dropped from 30.5 percent to 28.3 percent (compared to a drop in the manufacturing share from 12.2 to 11.7 in non-manufacturing dependent counties). Unemployment and underemployment declined by six percentage points less in manufacturing-dependent than non manufacturing-dependent counties.
- *In non-metropolitan Appalachia, industrially diversified (i.e., non-specialized) counties experienced the best performance from 1993 to 1998.* They had five and six percentage point larger declines in underemployment and unemployment than industrially specialized counties. By 1998, underemployment in non-specialized counties was 11.2 percent rather than the 12.2 percent in specialized counties.
- *For non-metropolitan counties, one positive development was the experience of counties with small urban areas (20,000 or more), not adjacent to a metropolitan area.* These communities experienced declines in unemployment and underemployment very similar to those of metropolitan counties. They experienced larger such declines than similar-sized urban areas adjacent to metropolitan areas. This could reflect the inward migration of internet professionals and/or retirees attracted by scenic beauty and, in some cases, well-maintained small town centers.
- *Another positive development for non-metropolitan counties was the very low unemployment (4.5 percent) and rapidly improving unemployment and underemployment in the 19 counties which are retirement destinations.*
- *There is no evidence in our analysis that sole proprietorship stimulates economic development.* For the most part, our proprietorship variable (sole proprietorship plus partnerships) expands the greater is economic distress. It appears to be “entrepreneurship of necessity,” fueled by lack of alternatives, more often than “entrepreneurship of opportunity” based on the promise of large economic gains.

To gain further insight into how policymakers and practitioners might promote more successful economic development, we interviewed eight economic development practitioners from local development districts with low underemployment and unemployment. Rather than simply recruiting low-wage employers, these interviews reveal **that more successful Appalachian districts have embraced a second-generation development strategy that recognizes the importance of investment in public goods (education, infrastructure, workforce development).**

**There are hints of trying to move to a third generation approach that includes more pro-active encouragement of particular components of the local economic base.** In some cases, the search for a next-generation approach has been encouraged by regional strategic planning.

Particularly because low-wage manufacturing no longer appears viable for Appalachia, and even second generation approaches may not adequately adjust to global economic challenges, **ARC would be well placed to encourage efforts to better define and develop “third generation” development options for the region.**

Our final section outlines a sectoral initiatives project that ARC might undertake to expand policymaker and practitioner conceptions of how they might stimulate their regional economy. The conclusion also sketches case study research of successful regions that might fit into an ARC initiative to combat pessimism about the potential for development, especially in distressed areas.

## INTRODUCTION

Lack of data on local labor market conditions impedes policy-makers and practitioners from evaluating and improving economic development in the Appalachian Region. ARC commissioned this study to fill a particularly important data gap: the need for local measures of *labor force participation* and *underemployment* rates. For each of the years 1993 to 1998, we generated these two statistics for all 406 Appalachian counties and for a wide variety of groupings of counties.

Both labor force participation and underemployment rates are broader measures of labor market surplus than unemployment. The unemployed includes only individuals who have no paid employment and who are actively looking for work.<sup>1</sup>

*Underemployment*, the first alternative measure to unemployment to be considered, includes, in addition to the unemployed, three other categories:

- those working part-time but who want to work full time (“involuntary part-time workers,”)
- those who want to work but have been discouraged from searching by their lack of success (“discouraged workers”), and
- others who are neither working nor seeking work at the moment but who indicate that they want and are available to work and have looked for a job in the last 12 months.<sup>2</sup>

The *labor force participation rate* (LFPR) is the second alternative measure of labor market surplus considered, which equals employment plus unemployment as a percentage of the total number of people of working age (because an increasing number of older Americans now work, we consider all individuals 16 and over as “of working age”).<sup>3</sup> If large numbers of people are neither working nor looking for work – perhaps because of an absence of available employment – the unemployment rate remains unchanged but the labor force participation rate falls. Measured labor force participation may also be lower if off-the-books employment is high. Both lack of employment opportunities and underground employment are thought to be widespread in Appalachia.

In 1998, evaluated by the unemployment rate, Appalachian labor market performance was similar to that for the nation as a whole – 4.8 percent versus 4.6 percent (Figure 1). A much larger gap existed between Appalachian and U.S. underemployment and labor force participation rates. Appalachian underemployment equaled 10 percent compared to 8.6 percent for the United States. The labor force participation rate in Appalachia stood at 62 percent, six percentage points below the U.S. rate of 68 percent.

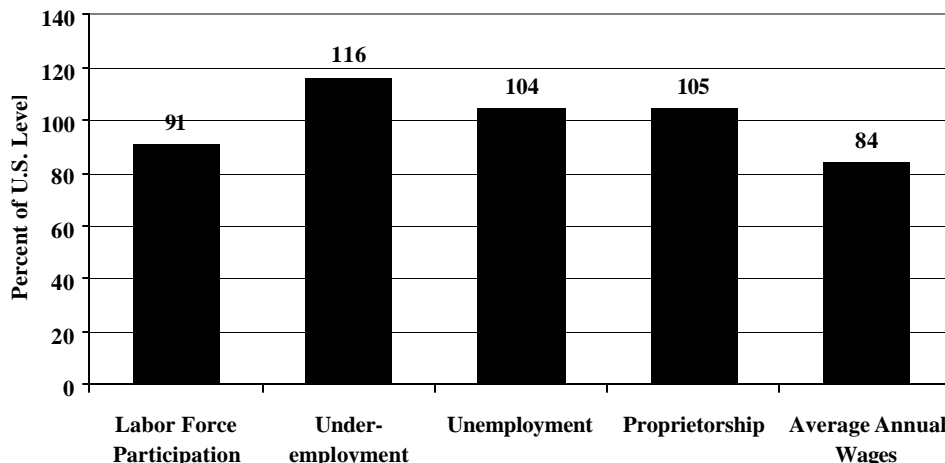
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<sup>1</sup> The unemployment rate equals unemployment as a percentage of the employed plus unemployed.

<sup>2</sup> Some other researchers add low-income workers into underemployment (see, for example, Jenson, Findeis, and Wang 1999). We do not. Our definitions are the same as those used by the Economic Policy Institute (Mishel, Bernstein, and Schmitt 1999, pp. 221-222). The underemployment rate is the number of underemployed persons as a percentage of the sum of the employed plus unemployed plus our three other categories that make up the underemployed.

<sup>3</sup> Twelve percent of people over 64 now work in the United States.

**Figure 1.**  
**Appalachian Labor Force Indicators, 1998**  
**(indexed to U.S. = 100)**



Source: Table 1.

Measuring LFPR and underemployment is important not only to gauge the need for employment creation. Studies of developing economies also suggest that a large underground or “informal” sector—indicated by low LFPR or high underemployment—may impede economic development. Informal operations—such as casual agricultural, construction, or household labor, subcontracting of labor-intensive assembly operations (as in apparel home work but also in other manufacturing), retail or other unreported self employment—operate outside the tax system and may not comply with labor standards or other regulations. Evading taxes and paying low wages, informal operations may choke off more productive, formal activity (Piore 1990). Moreover, few informal enterprises transform themselves through investment in skills and the accumulation of capital—they do not lead to the individual and organizational learning that are at the heart of genuine development.

Off the books economic activity may also block economic progress in rural areas of advanced countries. In contemporary American terminology, this would be an example of the “low road” (low-wage, low-skill, low-productivity operations) blocking the “high road” (higher-skill, higher productivity enterprises).<sup>4</sup>

For two reasons, then, ARC recognized the value of having local measures of unemployment and labor force participate. LFPR and underemployment provide a more expansive window than unemployment alone into the performance of the labor market. Low LFPR and high underemployment may also signal the existence of a substantial off-the-books employment and the need to break vicious circles of poverty and low-productivity economic activity.

In this study, after we estimated LFPR and underemployment, we incorporated them into a 1993-98 county level data set (now available from ARC) that also included

- unemployment,
- average annual wage,

<sup>4</sup> For one use of this term, see AFL-CIO 2000.



- proprietorship (sole proprietorship plus partners),
- demographic variables (age and race),
- educational attainment,
- the industrial composition of employment, and
- classifications of counties by economic base (e.g., are they “manufacturing dependent” or a “retirement destination”) and by their economic well-being (e.g., “distressed” or “competitive”)

With this data, we then sought to learn the correlates of good and bad labor market performance (measured especially by labor force participation and underemployment rates, but also by unemployment and the average annual wage). In conducting this analysis, we grouped Appalachian counties in a ways suggested by past research or based on the interests of policymakers and practitioners. We grouped counties by geography (e.g., sub-regions—south, central, north; state; local development district; proximity to a metropolitan area), industrial composition, economic base, and past economic performance.

The thrust of our analysis was descriptive. Nonetheless, ARC also sought to learn more about how policymakers and practitioners might promote more successful economic development. To gain further insight on this issue, we interviewed eight economic development practitioners from local development districts with very low underemployment. With an eye to possible lessons for other parts of Appalachia, we focused in these interviews on what explained each district’s success.

The remainder of this report divides into four sections. The next section contains a brief review of past research on Appalachian labor market and economic performance. It provides a context for the subsequent section, which details our analysis of labor market performance and the results of that analysis. The penultimate section of the report summarizes what we learned from our telephone interviews. The final section of the main report summarizes key findings from our analysis of labor force participation and underemployment in Appalachia. It also contains a brief discussion of the need for a “next generation” economic development strategy for Appalachia, along with suggestions for policy and further research.

## **FINDINGS FROM PAST RESEARCH**

Appalachia has long held the reputation as an “underdeveloped, lagging region” (Isserman 1996). The President’s Appalachian Regional Commission (PARC) reported in 1964 that the region had “low income levels, high unemployment rates, low education levels, high rates of poverty, and less population and employment growth than the nation” (cited in Isserman 1996). In the 36 years since the PARC report was written, much has changed. Appalachia is now marked more by intra-regional diversity in economic performance than by a general state of underdevelopment. As Isserman (1996) concluded, Appalachia is now a “dynamic, growing region that contains some of the poorest areas in the nation.”

### ***The Closing Economic Gap***

On nearly all indicators, Appalachia lagged the United States in the 1960s and early 1970s.

- Labor force participation was 53 percent in Appalachia in 1965, compared to nearly 70 percent for the U.S. as a whole. Within Appalachia, labor force participation varied from 55 percent in the South to 52 percent in the North to 46 percent in the Central region (ARC 1999).
- In 1960, Appalachian unemployment was 6.8, compared to 5.1 percent in the United States.
- Per capita income in Appalachia was 78.1 percent of the U.S. average in 1965.
- In 1960, the poverty rate in Appalachia was 31.1 percent, compared with 22.1 percent in the United States as a whole; in 1970, the corresponding figures were 18.1 and 13.7 percent.

- In 1960, 5.4 percent of persons over 25 had four or more years of college in Appalachia, compared with 7.7 percent for the United States.

Some three decades later,

- Appalachian labor force participation still lagged behind the United States, but only by a third as much as in 1965 (62 percent vs. 68 percent in 1968);
- Appalachian unemployment was only slightly higher than in the United States (in 1998 4.8 percent vs. 4.6 percent);
- Appalachian underemployment (for which no figure exists for the 1960s) was 10 percent in 1998 compared to the U.S. level of 8.6 percent;
- per capita income in Appalachia stood at 82.6 percent of the U.S. average by 1997, up 4.5 percentage points from 1965;
- the poverty rate in Appalachia in 1990 was 15.2 percent compared with 13.1 percent in the United States, a halving of the gap since 1970;
- the percentage of persons over 25 years of age with four or more years of college education rose to 14.3 percent in Appalachia in 1990, compared to 20.3 percent in the U.S.

While the economic gap between Appalachia and the United States in the 1990s has closed since the 1960s, several gaps have worsened since 1980, except with respect to per capita income. The number of counties in Appalachia that fall far behind the rest of the United States with respect to poverty levels and one or both per capita income and unemployment has increased since 1980.<sup>5</sup>

### ***Diversity in Population Trends***

Appalachia as a whole gained approximately four million people from 1970 to 2000, after losing population in the 1950s and 1960s (ARC 1999). The region's share of the total U.S. population declined from 9.1 percent to 8.1 percent. The population declined in Northern and Central subregions but grew in the Southern sub-region over the past three decades. In Appalachia as a whole, the younger age groups are a declining share of the population and older age groups are an increasing share. From 1980 to 1996 there was substantial out-migration of younger and better-educated persons and in-migration of elders to certain amenity-rich areas (McLaughlin 1999). More economically distressed areas are losing young and college educated persons, while economically prosperous areas are gaining them (Matthews 1999).

Within Appalachia, population growth and annual net migration rates have been highest in the Southern sub-region. Population growth has been highest in fringe metropolitan counties and rural counties adjacent to metropolitan areas -- especially near Atlanta and in large metropolitan areas in Alabama, Tennessee, and North Carolina (Matthews 1999).

Migration has reinforced the geographic concentration of poverty within Appalachia. The poor tend to move among high-poverty counties, especially rural counties, while the non-poor tend to move out of high-poverty counties (Nord et al. 1995).

### ***The Role of Manufacturing***

Manufacturing, since the 1960s, has been seen as a cornerstone of Appalachia's economic development efforts. Forty-eight of 116 Appalachian counties that were "distressed" in 1960 but not distressed in 1990 were manufacturing-dependent (Wood and Bischak 2000). Nonetheless, because of a traditional economic development strategy of using low wages to attract businesses, much Appalachian

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<sup>5</sup> Wood and Bischak 2000 plus data in this report.

manufacturing is low-skill. Manufacturing jobs in the rural South (not just the Appalachian region) still pay only 68 percent of U.S. average, the same as in 1969 (Rowley and Freshwater 1999). Looking just at Appalachia, Jensen (1998) found that manufacturing, relative to the rest of the country, still looked low-wage and low-productivity in 1992 as it did in 1967. Within rural Appalachia, Wojan (1998) found that manufacturing facilities have lower functional skill requirements vis-à-vis urban counterparts. Overall, manufacturing employment grew in rural areas – which by and large did less well economically -- in the 1980s and early 1990s but fell in the metropolitan areas of Appalachia (Barkley 1995; Bernat 1994; Bernat 1995). With a disproportionate share of its employment in rural areas, wages in manufacturing fell relative to metropolitan wages.

Southern region manufacturing has closed the wage and productivity gap with the United States over the past three decades. The Central region has not. The Northern gap has grown (Jensen 1998). Manufacturing industries with the highest skill requirements (and spatially integrated production) were the fastest *growing* industries in rural areas during the 1970 to 1990 period (Wojan 1998). Growth of the least skilled industry group (i.e. traditional rural production with low skill requirements) was flat over the previous 20 years in rural areas. Wojan (1998) also found that in both urban and rural counties in the southeastern U.S., high-quality firms (as indicated by obtaining ISO 9000 certification) cluster together. Counties with ISO 9000 firms attract more of them; counties without them have not attracted them. Lichter and McLaughlin (1995) report that in the 1980s, higher levels of manufacturing employment were associated with lower levels of poverty at the county level. In sum, the impact of manufacturing on economic development depends on the kind of manufacturing. The policy challenge is to retain and expand higher value added production and hence manufacturing jobs that provide decent pay and opportunities (Wojan 1998).

### ***The Metropolitan/Rural Split***

The metropolitan/rural gap in Appalachia is a familiar one. The data in this report show the gap remains. Non-metropolitan underemployment was 12.1 percent in 1998 compared to 8.5 percent in metropolitan areas. Jensen et al. (1999) show that rural workers in the South tend to have lower rates of labor force participation and higher rates of underemployment, as well as a lower rate of college education. Rural workers are also likely to be poorer than metropolitan workers (USDA ERS 1995; Lichter and McLaughlin 1995; Lichter et al. 1994; McLaughlin and Perman 1991).

Hamrick (1998 and 1998) points to some more encouraging news for rural areas. Following the recession of 1990-91, rural labor markets responded better than urban (Hamrick 1999). Non-metropolitan displaced workers also found new jobs faster and suffered less earnings loss on the new job than did their metropolitan counterparts (Hamrick 1998). However, the evidence in this report suggests that this relative improvement was not sustained in rural Appalachia in the 1993 to 1998 period. It was probably a cyclical phenomenon, reflecting the dependence of rural areas on goods producing industries that are more sensitive to the business cycle.

There are some signs of non-metropolitan growth as a result of the spread outward of suburban sprawl and/or from relocation by internet professionals or retirees to physically attractive small towns. Ghelfi and Parker (1997) found that counties adjacent to metropolitan areas grew fastest in the 1980s. They also noted that while employment growth was fastest in metropolitan areas in the 1980s, employment growth was fastest in rural counties adjacent to large metropolitan areas in the 1990s. Likewise, population growth and annual net migration rates within Appalachia were highest in the 1990s in fringe metropolitan counties and in rural counties adjacent to metropolitan areas (Matthews 1999).

As a response to the lack of adequate employment opportunities in rural areas, growth in entrepreneurial activities and sole proprietorship has sometimes been advocated. Along with relatively high levels of job

creation in parts of Appalachia due to entrepreneurial efforts, however, the region's sole proprietors tend to have lower incomes than those in the rest of the United States (Clones 1998).

## **ANALYSIS OF 1993-98 DATA**

We now turn to our analysis of the 1993 to 1998 data set constructed for this project. As explained above, in analyzing this data, we grouped counties in various ways based on geography, economic base, and level of economic distress. At the beginning of our analysis, we explored the use of statistical cluster techniques to see whether two or more natural groupings of counties (defined by weighted combinations of multiple variables) emerged from our data with widely different labor market performance. Since no such clusters emerged we fell back on grouping the data by the variables below, suggested by prior research or of utility to particular policymakers (e.g., from each state) or practitioners (e.g., from each local development district).

- *State and multi-state region* (i.e., northern, central, and southern Appalachia).
- The 71 Appalachian *local development districts (LDDs)*. We also analyzed the 10 LDDs with the lowest underemployment rates in 1998 and the 10 LDDs with the highest underemployment rates in 1998.
- A four-level classification of Appalachian counties based on *economic well-being* (*distressed, transitional, competitive, and attainment* counties).
- *Metropolitan and non-metropolitan* counties.
- Using the Rural-Urban continuum, a nine-category classification developed by the U.S. Department of Agriculture's Economic Research Service, and often referred to as the *Beale Code* after its principal author, demographer Calvin Beale. Conceptually, Beale codes are a more subtle geographic variable than metropolitan/non-metropolitan or city/suburban/rural. Beale codes differentiate metropolitan counties based on the size of the metropolitan area and whether the county falls into the center or periphery of the metropolitan area. They differentiate non-metropolitan counties based on proximity to a metropolitan area and the size of the county's largest locality.
- *Economic base*: in the late 1980s or early 1990s, the Economic Research Service of the U.S. Department of Agriculture produced a classification of all non-metropolitan counties according to their economic base. Economic base may correspond to a dominant industry or to another important aspect of economic activity, such as being a retirement destination.
- We also examine variations in labor market indicators by age, race, sex, and educational level.

**TABLE 1.  
LABOR FORCE VARIABLES FOR APPALACHIA AND THE UNITED STATES**

	1993	1994	1995	1996	1997	1998	<b>Change (percent)</b> 1993 to 1998
<i>Employment</i> (millions)							
United States	142.0	145.7	149.4	152.7	156.4	159.2	12.1
Appalachia	26.2	26.8	27.4	27.8	28.4	28.5	8.8
<i>Average Annual Wages</i> (nominal dollars)							
United States	\$25,914	\$26,528	\$27,413	\$28,479	\$29,814	\$31,764	22.6
Appalachia	\$22,017	\$22,664	\$23,329	\$24,108	\$25,049	\$26,695	21.3
<i>Labor Force Participation</i> (percent)							
United States	66.8	67.0	67.0	67.2	67.5	67.7	1.3
Appalachia	61.1	61.3	61.3	61.3	62.1	61.6	0.8
<i>Unemployment Rate</i> (percent)							
United States	7.0	6.2	5.7	5.5	5.1	4.6	-33.9
Appalachia	7.3	6.3	6.0	5.7	5.5	4.8	-34.2
<i>Underemployment Rate*</i> (percent)							
United States	N/A	11.6	10.8	10.3	9.5	8.6	-25.7
Appalachia	14.3	12.6	12.0	11.4	11.1	10.0	-20.7
<i>Proprietorship</i> (percent)							
United States	16.3	16.3	16.4	16.6	16.7	16.7	2.4
Appalachia	17.1	17.0	17.1	17.4	17.5	17.5	2.4

\*Underemployment change is measured for the period 1994 to 1998

Note: In this and subsequent tables, average annual wages are nominal.

Sources: see Technical Appendix.

### *Appalachia and The United States*

Comparing with the United States as a whole over the period 1993 to 1998, Table 1 shows Appalachia's higher underemployment rate, slightly higher unemployment and proprietorship rates, and lower labor force participation rate (see also Figure 1 above). Over this period, unemployment fell and proprietorship rose at about the same rate in Appalachia as in the nation as a whole. Underemployment did not fall quite as fast, and labor force participation and the number of jobs did not grow quite as fast, in Appalachia as in the entire United States.

**TABLE 2.  
EMPLOYMENT SHARES BY SECTOR (percent)**

	Share of total employment (percent)						Change in Employment Share (percent)
	1993	1994	1995	1996	1997	1998	1993 to 1998
<i>Agriculture</i>							
United States	1.2	1.2	1.2	1.2	1.3	1.3	9.8
Appalachia	0.7	0.8	0.8	0.7	0.8	0.8	7.8
<i>Crop and Livestock Production</i>							
United States	3.1	2.9	2.8	2.7	2.7	2.7	-11.2
Appalachia	2.1	2.0	2.0	1.9	1.9	1.9	-10.8
<i>Construction</i>							
United States	4.9	5.1	5.2	5.3	5.4	5.4	8.3
Appalachia	5.5	5.7	5.8	5.8	5.9	5.9	7.1
<i>Mining</i>							
United States	0.7	0.6	0.6	0.5	0.5	0.5	-19.0
Appalachia	1.2	1.1	1.0	0.9	1.0	0.9	-18.6
<i>Manufacturing</i>							
United States	13.2	13.1	12.9	12.6	12.4	12.4	-6.0
Appalachia	18.6	18.5	18.1	17.6	17.2	17.3	-7.4
<i>Finance, Insurance, and Real Estate (FIRE)</i>							
United States	7.4	7.4	7.4	7.4	7.5	7.5	1.8
Appalachia	5.0	5.2	5.3	5.4	5.4	5.4	8.5
<i>Government</i>							
United States	15.2	14.8	14.5	14.2	13.9	13.9	-8.1
Appalachia	14.0	13.9	13.6	13.5	13.3	13.3	-4.8
<i>Transportation and Public Utilities</i>							
United States	4.7	4.8	4.7	4.8	4.8	4.8	2.0
Appalachia	4.5	4.5	4.4	4.4	4.5	4.5	0.7
<i>Wholesale Trade</i>							
United States	4.6	4.6	4.6	4.6	4.6	4.6	-0.8
Appalachia	4.0	4.0	4.0	4.0	4.1	4.1	0.6
<i>Retail Trade</i>							
United States	16.5	16.8	16.9	16.9	16.9	16.9	2.0
Appalachia	17.3	17.5	17.8	17.9	18.0	18.0	4.3
<i>Services</i>							
United States	29.5	29.6	30.1	30.5	30.8	30.8	4.5
Appalachia	25.8	25.8	26.1	26.1	26.7	26.7	3.3

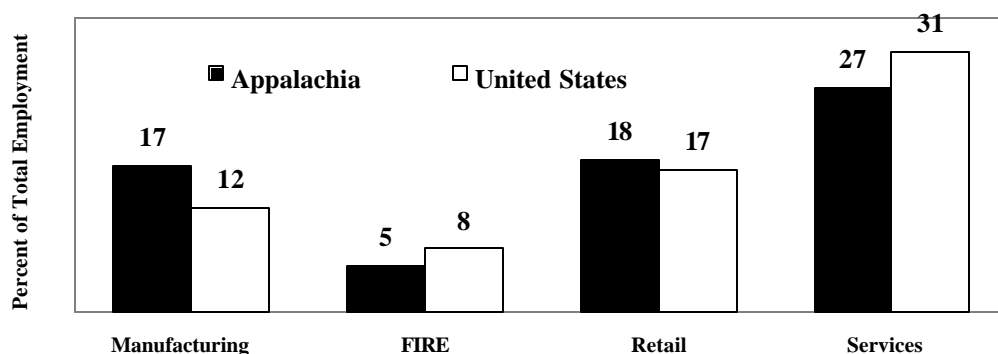
Sources: see Technical Appendix.

### *Industrial Composition in the United States and Appalachia*

Table 2 and Figure 2 show that the industrial structure of Appalachia is distinguished from that of the United States as a whole by

- a substantially higher share of manufacturing employment (17.3 percent of employment in 1998 compared to 12.4 percent in the United States),
- a lower share of finance, insurance, and real estate (FIRE) (5.4 percent versus 7.5 percent),
- a higher share of retail trade (18 percent compared to 16.9 percent), and
- a lower share of “services” employment (26.7 percent compared to 30.8).

**Figure 2.**  
**Sectoral Differences in Employment,**  
**Appalachia and the United States, 1998**



Source: Table 1.

Changes in employment shares by major industry in Appalachia between 1993 and 1998 paralleled those in the United States as a whole, except in the following cases.

- FIRE employment grew by 8.5 percent in Appalachia compared to 1.8 percent in the United States.
- Government employment fell by 4.8 percent in Appalachia, compared to 8.1 percent in the United States. This is probably due to Appalachia receiving less than one third the national per capita average level of defense and space funding (Bagi, Reeder, and Calhoun 1999, p. 15), and therefore suffering less from defense cutbacks.
- Retail trade expanded slightly more rapidly in Appalachia.

### *Appalachian Sub-regions*

Appalachia’s three sub-regions are the North; which includes 144 counties, Central, which includes 85, and the South, which includes 177.

Table 3 and Figure 3 show that from 1993 to 1998

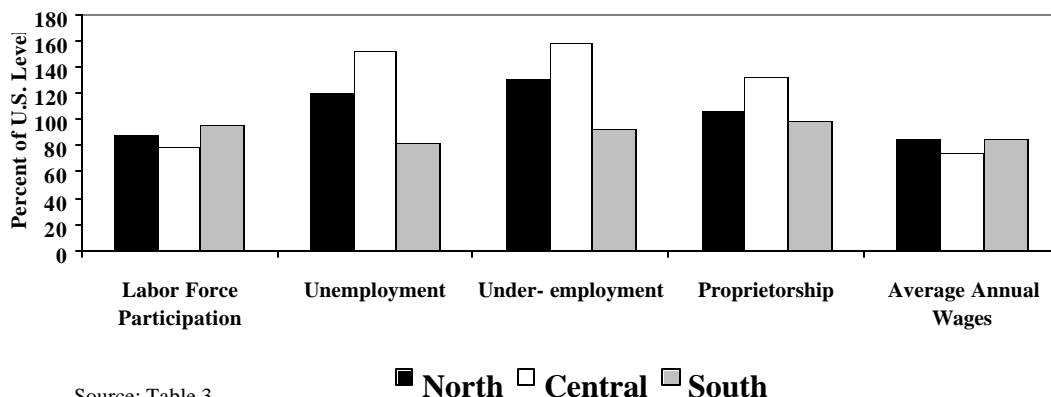
- job growth was by far the fastest in the South and slowest in the North;
- unemployment and underemployment were highest in the Central sub-region and lowest in the South;
- the South had the largest declines in unemployment and underemployment;
- the South was the only Appalachian sub-region that had lower unemployment and underemployment rates than the United States as a whole;
- labor force participation was highest in the South and lowest in the Central region;
- proprietorship was much higher in the Central than in the other two sub-regions;
- wages were highest in the North and lowest in the Central; and

- wage growth was fastest in the South and slowest in the Central. By 1998, Southern wages were 99 percent of those in the North but Central wages were only 87 percent of those in the North.

Turning to industrial composition

- the South had a substantially higher employment share in manufacturing—20 percent as compared to 14 percent—than the other two sub-regions;
- the job shares of farming, mining, manufacturing, and government fell everywhere, but manufacturing declined particularly rapidly in the South;
- the Central region had substantially more of its workers employed in farms and mines than the other two sub-regions;
- the North had a higher employment share in services than the other two sub-regions;
- the employment shares of construction, retail trade, services, and finance, insurance, and real estate rose in all three sub-regions;
- agricultural services’ employment share rose in the North and South but fell in the Central;
- the transportation and public utilities and wholesale trade employment share rose in the Central and South but fell in the North.

**Figure 3.**  
**Regional Appalachian Labor Force Indicators, 1998**  
**(indexed to U.S. = 100)**



Source: Table 3.



**TABLE 3.  
APPALACHIAN SUB-REGIONS**

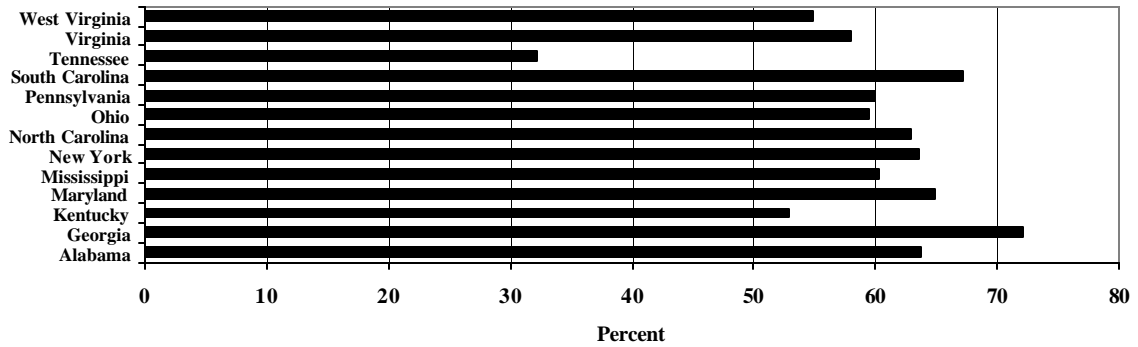
	<b>North</b>	<b>Centra l</b>	<b>South</b>
Labor Force Participation 1998 (percent)	59.8	53.3	65.1
Unemployment 1998 (percent)	5.5	7.0	3.8
Underemployment 1998 (percent)	11.2	13.6	8.0
Proprietorship 1998 (percent)	17.8	22.0	16.4
Average Annual Wage 1998 (nominal dollars)	27,137	23,585	26,804
Labor Force Participation, Percent Change 1993-98	+0.6	+0.5	+0.7
Unemployment, Percent Change 1993-98	-33.1	-27.4	-36.4
Underemployment, Percent Change 1993-98	-29.3	-24.8	-31.8
Proprietorship, Percent Change 1993-98	+5.6	+0.9	-0.1
Average Annual Wage, Percent Change 1993-98	+20.3	+19.0	+22.5
Total Employment, Percent Change 1993-98	+6.1	+7.3	+11.7
Farm Employment Share 1998 (percent)	2.1	7.1	2.5
Mining Employment Share 1998 (percent)	1.0	4.1	0.3
Manufacturing Employment Share 1998 (percent)	14.4	14.3	20.3
Services Employment Share 1998 (percent)	29.6	22.9	24.5
Farm Employment Share, Percent Change 1993-98	-8.9	-10.0	-13.5
Mining Employment Share, Percent Change 1993-98	-18.1	-20.6	-8.7
Manufacturing Employment Share, Percent Change 1993-98	-5.2	-5.1	-9.8
Services Employment Share, Percent Change 1993-98	+2.2	+3.3	+5.2
Construction Employment Share, Percent Change 1993-98	+3.3	+6.0	+9.8
FIRE Employment Share, Percent Change 1993-98	+10.0	+5.2	+7.7

Sources: see Technical Appendix.

### *Comparisons By State*

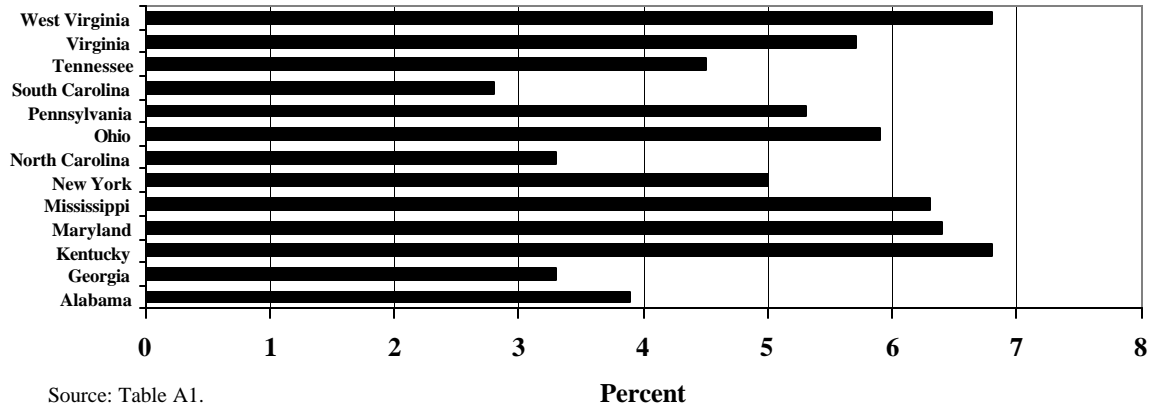
Labor force variables and trends in the Appalachian portion of each of the 13 states are compared in Figures 4-9, based on data in Appendix Table A1. Figure 4 shows that the labor force participation rate is dramatically lower in the Appalachian portion of Tennessee than in any other state. LFPR is also low in Appalachian Kentucky, while it is high in Appalachian Georgia and, to a lesser extent, South Carolina.

**Figure 4.**  
**Labor Force Participation Rate in the Appalachian Region**  
**of Each State, 1998 (percent)**



Source: Table A1.

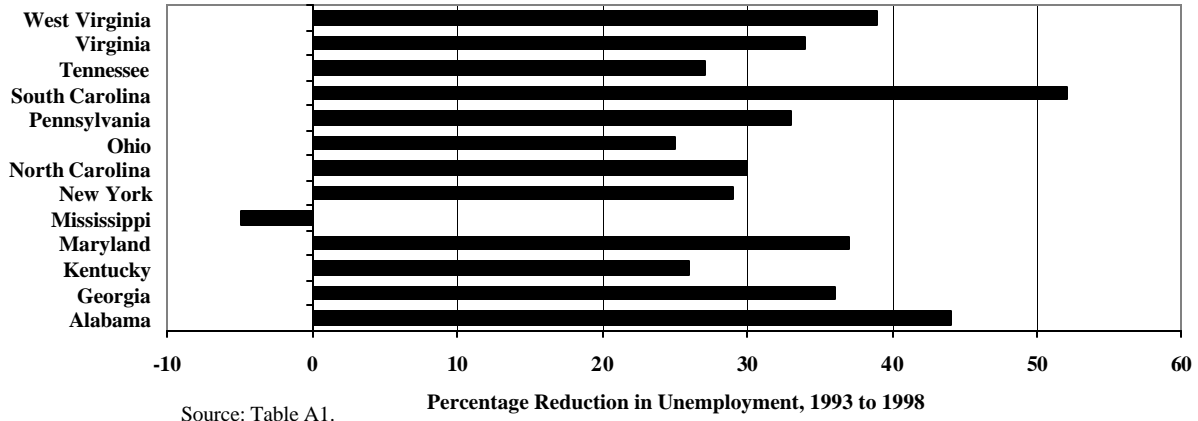
**Figure 5.**  
**Unemployment Rate in the Appalachian Portion of Each**  
**State, 1998 (percent)**



Source: Table A1.

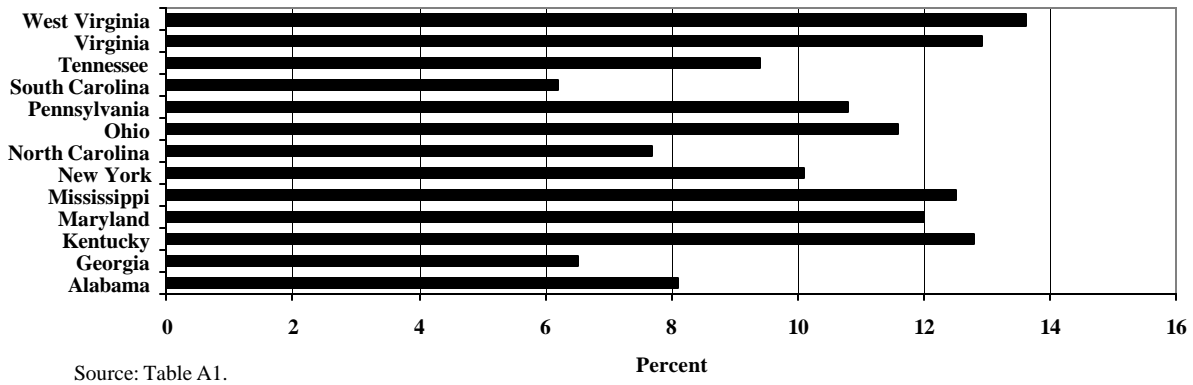
Unemployment (Figure 5) is highest in Appalachian Kentucky and West Virginia, lowest in the Carolinas, Georgia, and Alabama.

**Figure 6.**  
**Drop in Unemployment, 1993 to 1998,**  
**in the Appalachian Part of Each State**



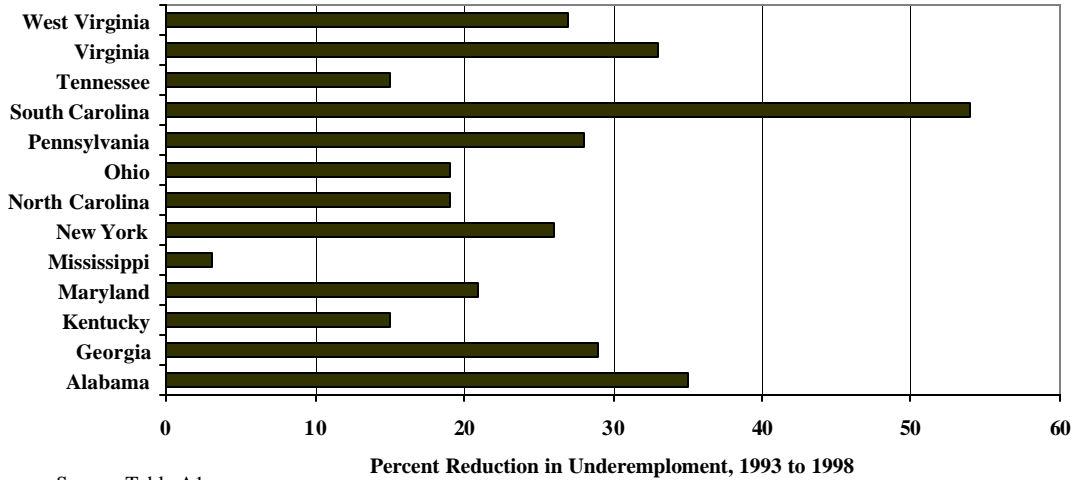
Unemployment dropped the most from 1993 to 1998 in South Carolina, followed by Alabama (Figure 6). It rose in Mississippi.

**Figure 7.**  
**Underemployment Rate in the Appalachian Portion of Each**  
**State, 1998 (percent)**



Underemployment was highest in West Virginia, followed by Appalachian Mississippi, Maryland, and Kentucky (Figure 7). The Carolinas and Georgia had the lowest underemployment.

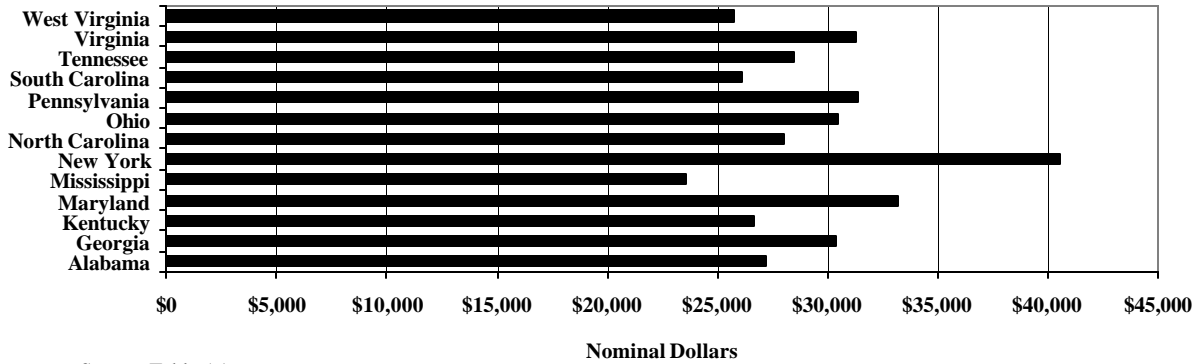
**Figure 8.**  
**Drop in Underemployment Rate, 1993 to 1998,**  
**in the Appalachian Portion of the State (percent)**



Source: Table A1.

The drop in underemployment was greatest in South Carolina, smallest in Mississippi (Figure 8).

**Figure 9.**  
**Average Annual Wage in the Appalachian Portion of Each**  
**State, 1998 (nominal dollars)**

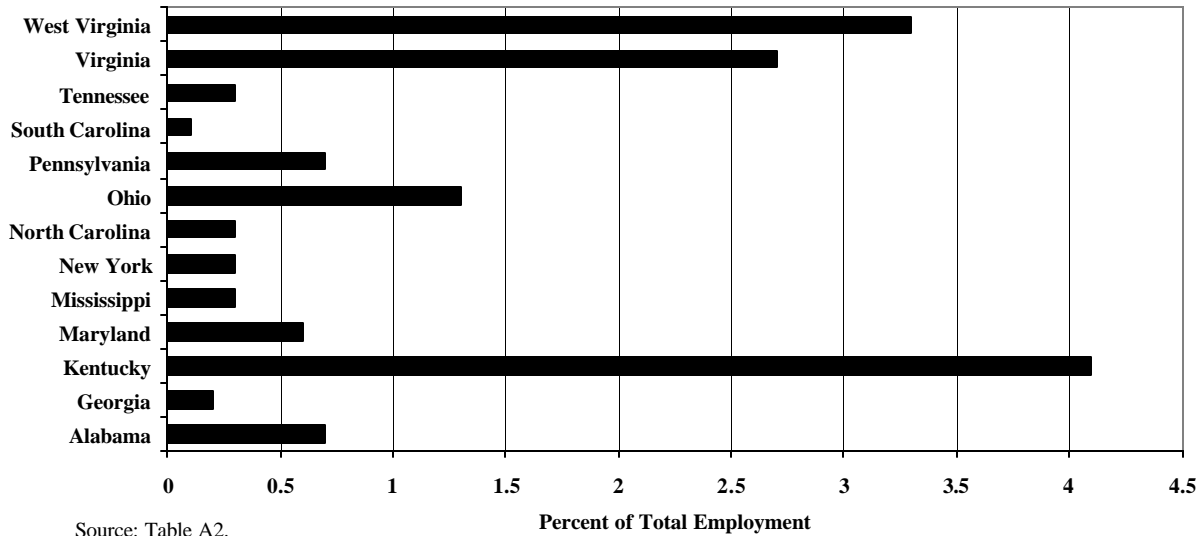


Source: Table A1.

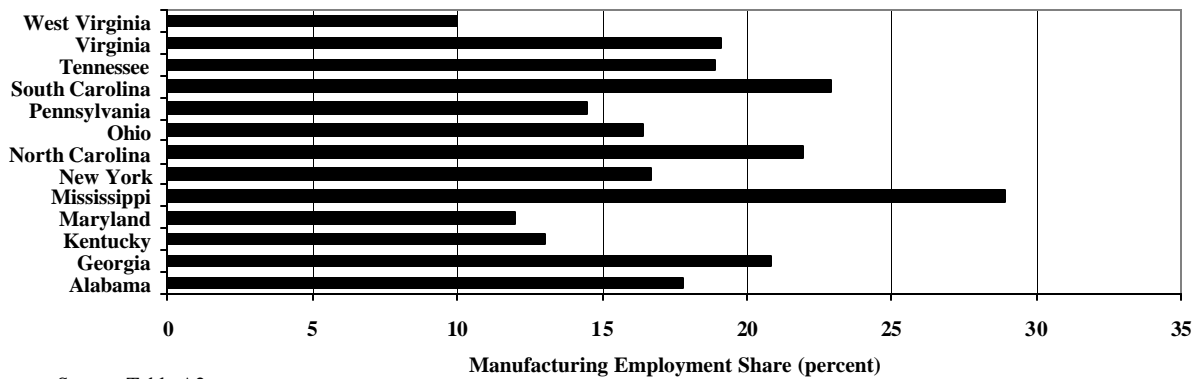
Average annual wages are similar except in New York, where they are much higher.

The industrial composition in Appalachian states are compared in Figures 10-14, based on data reported Tables A2 and A3.

**Figure 10.**  
**Mining Employment Share in the Appalachian**  
**Part of Each State, 1998 (percent)**

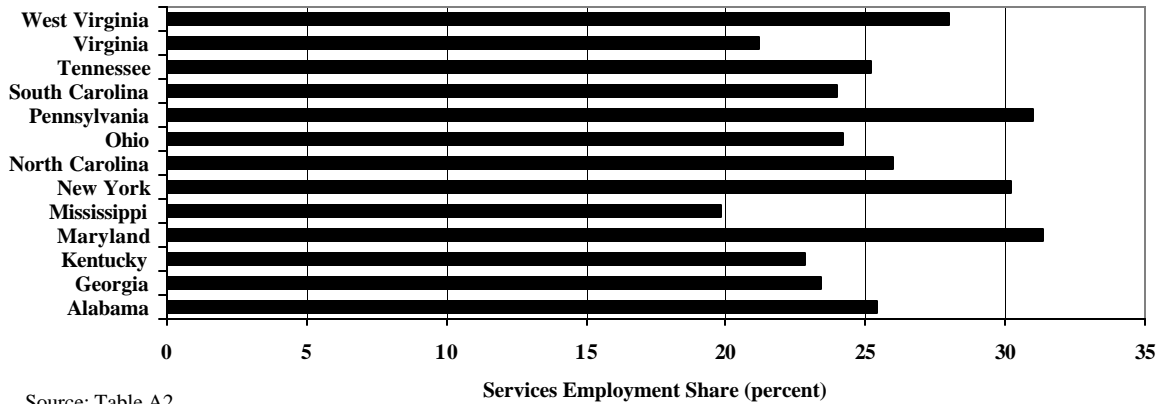


**Figure 11.**  
**Manufacturing Employment Share in the Appalachian Part**  
**of Each State, 1998 (percent)**



Figures 10 and 11 show the wide variation in the mining and manufacturing employment share in the Appalachian region of each state.

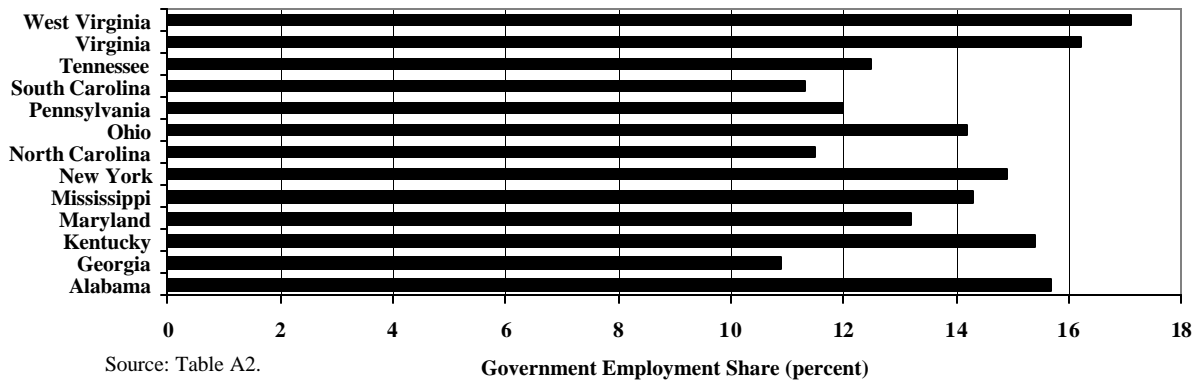
**Figure 12.**  
**Services Employment Share in the Appalachian Part of**  
**Each State, 1998 (percent)**



Source: Table A2.

There are less dramatic differences in the services and government employment shares (Figure 12 and 13).

**Figure 13.**  
**Government Employment Share in the Appalachian Part of**  
**Each State, 1998 (percent)**



Source: Table A2.

Decomposing the high rate of 1993 to 1998 FIRE employment growth within Appalachia by state (Figure 14), we find:

- FIRE employment mushroomed by 25 to 27 percent in the Appalachian portions of New York and Tennessee;
- FIRE employment rose by 9.9 to 11.2 percent in the Appalachian part of four other states (Georgia, North Carolina, Ohio, and Pennsylvania);
- in the Appalachian part of six other states, FIRE employment changed by somewhere in the range of -4.5 to +3 percent.
- In Kentucky, it fell 10.6 percent.

**Figure 14.**  
**Change in FIRE Employment in the Appalachian Part of**  
**Each State, 1993 to 1998 (percent)**



These trends may reflect the geographic decentralization of financial processing operations and call center operations (on this, see Keystone Research Center 1998). Financial processing operations and call centers, however, have telecommunications infrastructure and workforce skill requirements that may restrict their expansion in the most underdeveloped parts of Appalachia.

In other sectors:

- service employment rose in the Appalachian part of every state, the highest rate being about 12 percent in Maryland and Mississippi;
- construction employment rose in the Appalachian part of every state, the highest rate being about 12 percent in North Carolina and Alabama;
- manufacturing employment fell in the Appalachian portion of every state, the largest declines being 12 percent in Mississippi and the Carolinas.

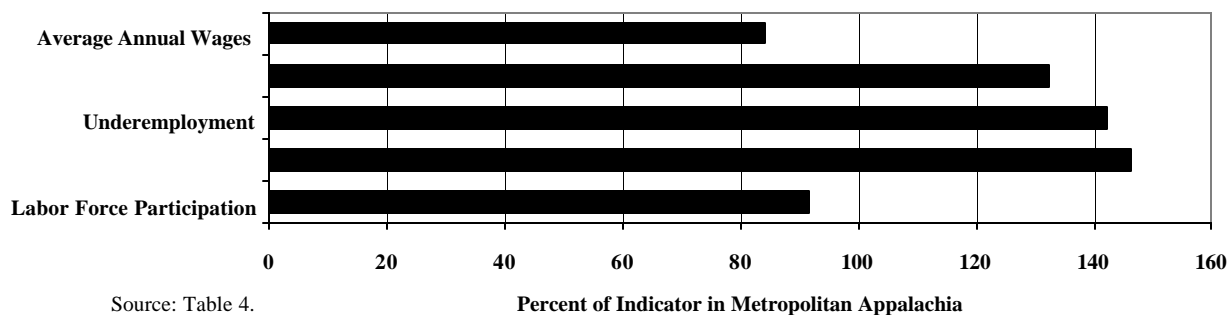
***Metropolitan and Non-metropolitan Counties***

One hundred and nine Appalachian counties are in metropolitan areas, and 297 are classified as non-metropolitan. From 1993 to 1998, metropolitan counties in Appalachia were much better off economically than non-metropolitan counties (Table 4 and Figure 15).

- Non-metropolitan Appalachia had over 40 percent higher unemployment and underemployment in 1998 and nearly 10 percent higher labor force participation.
- Metropolitan labor force participation rose 1.5 percent, while non-metropolitan labor force participation hardly changed.
- Unemployment and underemployment declined faster in metropolitan counties.
- Metropolitan counties had substantially lower proprietorship than non-metropolitan counties.
- Metropolitan job growth slightly outpaced non-metropolitan.
- In 1998, wages in metropolitan Appalachia were about 19 percent higher than those in non-metropolitan parts of the region.
- Farming, mining, manufacturing, and government accounted for smaller shares of employment in metropolitan counties than in non-metropolitan ones.

- Services and finance, insurance, and real estate were larger sources of employment in metropolitan counties.
- Employment in agricultural services and transportation and public utilities grew faster in metropolitan counties, while FIRE grew more slowly.
- Government jobs declined faster in metropolitan counties and mining jobs in non-metropolitan.

**Figure 15.**  
**Labor Force Indicators in Non-metropolitan Appalachia,**  
**1998**  
**(indexed to metropolitan Appalachia = 100)**





**TABLE 4.  
METROPOLITAN AND NON-METROPOLITAN COUNTIES IN APPALACHIA**

	<b>Non-metropolitan</b>	<b>Metropolitan</b>
Labor Force Participation Rate 1998 (percent)	58.5	63.9
Unemployment Rate 1998 (percent)	6.0	4.1
Underemployment 1998 (percent)	12.1	8.5
Proprietorship 1998 (percent)	20.5	15.5
Average Annual Wage 1998 (nominal dollars)	23,924	28,435
Labor Force Participation, Percent Change 1993-98	-0.3	+1.5
Unemployment, Percent Change 1993-98	-29.5	-38.1
Underemployment, Percent Change 1993-98	-26.4	-33.5
Proprietorship, Percent Change 1993-98	+2.0	+2.9
Average Annual Wage, Percent Change 1993-98	+20.9	+21.3
Total Employment, Percent Change 1993-98	+8.0	+9.4
Farm Employment Share 1998 (percent)	4.8	1.4
Mining Employment Share 1998 (percent)	1.7	0.4
Manufacturing Employment Share 1998 (percent)	20.6	15.1
FIRE Employment Share 1998 (percent)	4.2	6.2
Services Employment Share 1998 (percent)	22.9	29.1
Government Employment Share 1998 (percent)	14.4	12.6
Agricultural Services Employment Share, Percent Change 1993-98	+1.2	+12.4
Mining Trade Employment Share, Percent Change 1993-98	-19.3	-14.9
Transportation & Public Utilities Employment Share, Percent Change 1993-98	+4.8	+8.2
FIRE Employment Share, Percent Change 1993-98	+10.7	+7.5
Government Employment Share, Percent Change 1993-98	-2.9	-6.1

Sources: see Technical Appendix.

***Labor Force Variables and Industrial Composition By Beale Codes***

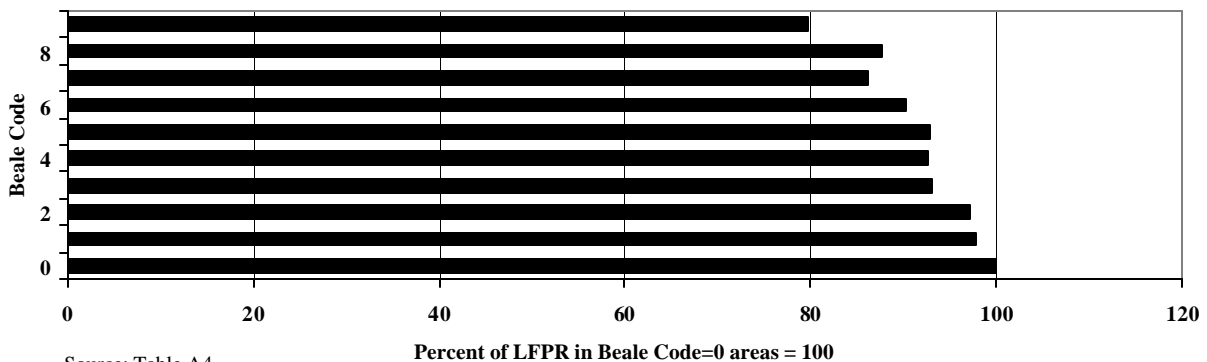
To further explore the relationship between economic variables and proximity to metropolitan areas, we examined the experience of Appalachian codes using Beale Codes (Table A5 to A7). These codes range from 0 to 9 and are defined as follows:

Beale Code	Definition
0	Central counties of metropolitan areas with one million or more people
1	Fringe counties of metropolitan areas with more than one million people
2	Counties in metropolitan areas with 250,000 to one million people
3	Counties in metropolitan areas of less than 250,000 people
4	Urban population of 20,000 or more, adjacent to a metropolitan area
5	Urban population of 20,000 or more, not adjacent to a metropolitan area
6	Urban population of 2,500 to 19,999, adjacent to a metropolitan area
7	Urban population of 2,500 to 19,999, not adjacent to a metropolitan area
8	Completely rural (no places with 2,500 or more) adjacent to a metropolitan area
9	Completely rural (no places with 2,500 or more) not adjacent to a metropolitan area

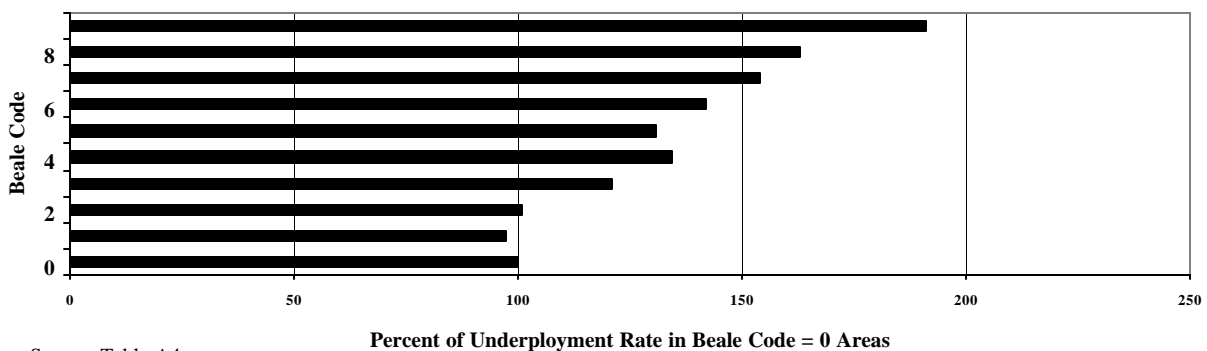
In 1998, unemployment and underemployment (Figure 17) were lowest, and labor force participation (Figure 16) highest, in counties in central counties of large metropolitan areas (Beale Code=0) (in practice, this category includes only Allegheny County in Pennsylvania, the central county of the Pittsburgh metropolitan area).

Between 1993 and 1998, fringe counties of metropolitan areas with a population of 250,000 or more (Beale Code = 1) (i.e., counties besides Allegheny in the Pittsburgh metropolitan area) experienced the largest decline in unemployment, underemployment, and proprietorship; and the fastest employment and wage growth.

**Figure 16.**  
**Labor Force Participation Rate by Beale Code in**  
**Appalachia**  
**(indexed to Beale Code=0 areas =100)**



**Figure 17.**  
**Underemployment Rate in Appalachia by Beale Code, 1998**  
**(indexed to Beale Code=0 areas = 100)**



Completely rural counties not adjacent to a metropolitan area (Beale Code = 9) have the highest unemployment and underemployment and the lowest labor force participation. These same counties also

experienced the least improvement in labor force variables between 1993 and 1998, including a decline in labor force participation.

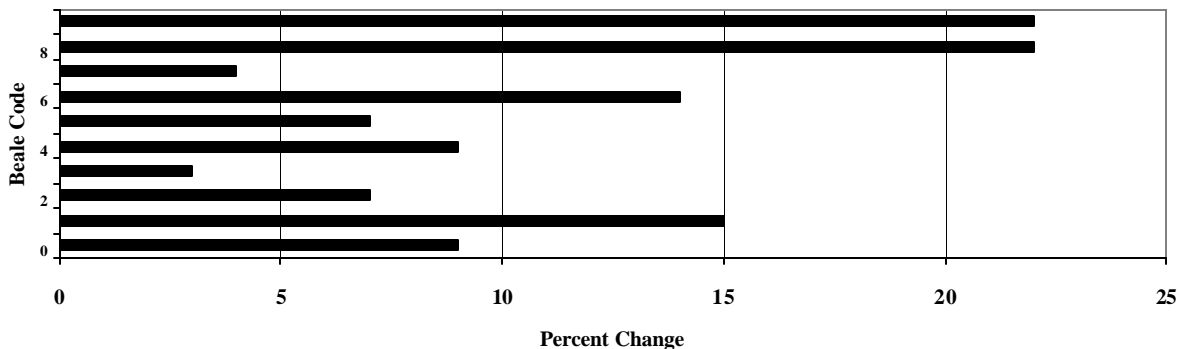
Small towns not adjacent to a metropolitan area (Beale Code = 5) experienced a larger decline in unemployment in the 1993 to 1998 period than towns of the same size that are adjacent to an metropolitan area (Beale Code = 4). Beale Code=5 counties also have more services employment than any other Beale category except Beale Code = 0. These characteristics raise the possibility that some small towns away from large metropolitan areas are attracting higher-income individuals, including internet professionals and retirees, based on their bucolic appeal.

Wage levels were highest in central counties of large metropolitan areas (Beale Code=0) – i.e., Allegheny County. While Allegheny County wages are high relative to wages in the rest of Appalachia, over the 1979 to 1999 period, the median wage in metropolitan Pittsburgh plummeted 16 percent, from \$14.06 to \$11.80 (in 1999 dollars) (Herzenberg and Bradley 2000, p. 23).

The second-highest wages were found in counties of 250,000 to one million people (Beale Code=2). Four different Beale Codes (1 and 3-5) make up the third wage tier, all of which had similar wage levels. Wages were lowest in completely rural non-metropolitan counties (Beale Codes=8 and 9)

The industrial composition of rural areas (Beale Codes 8, 9) and small towns (urban population < 20,000 but > 2500) not adjacent to a metropolitan area (Beale Code = 7) differs substantially from that of all other counties (Table A5). These areas have more crop and livestock production, more mining, and less wholesale trade, retail trade, FIRE, and services. In FIRE, however, employment increased the fastest in rural areas from 1993 to 1998 (Figure 18).

**Figure 18.**  
**Change in FIRE Employment in Appalachia**  
**by Beale Code, 1993-98 (percent)**



Source: Table A6.

***Persistent Poverty Non-metropolitan Counties***

Ninety-three non-metropolitan Appalachian counties are classified as having persistent poverty, defined as having 20 percent or more of the total population in poverty according to the U.S. Census in 1960, 1970, 1980, and 1990. Two hundred and four non-metropolitan Appalachian counties are classified as not having persistent poverty.

Table 5 details the characteristics of persistent poverty counties and those that have not experienced persistent poverty. Persistent poverty counties have higher unemployment and underemployment, lower wages, and lower labor force participation.

Persistent poverty counties benefited less than other non-metropolitan counties from the economic expansion of the 1990s.

- Unemployment and underemployment did not fall as much (in relative terms) during 1993-98 in persistent poverty counties as in other non-metropolitan counties.
- Employment did not rise as much in persistent poverty counties.
- Relative wages and labor force participation in persistent poverty counties did not change substantially over the 1993 to 1998 period.

Farming and government accounted for a higher employment share in persistent poverty counties, while manufacturing accounted for a lower share.

<b>TABLE 5.</b>		
<b>PERSISTENT POVERTY NON-METROPOLITAN COUNTIES</b>		
	<b>NOT PERSISTENT POVERTY</b>	<b>PERSISTENT POVERTY</b>
Underemployment 1998 (percent)	11.6	13.9
Unemployment Rate 1998 (percent)	5.7	7.3
Labor Force Participation Rate 1998 (percent)	59.8	52.9
Underemployment, Percent Change 1993-98	-28.1	-19.6
Unemployment, Percent Change 1993-98	-31.4	-21.2
Labor Force Participation, Percent Change 1993-98	-0.3	-0.6
Sole Proprietorship 1998 (percent)	20.0	23.4
Sole Proprietorship, Percent Change 1993-98	+2.2	+1.2
Average Annual Wage 1998 (nominal dollars)	24,376	21,716
Average Annual Wage, Percent Change 1993-98	+20.9	+20.8
Total Employment, Percent Change 1993-98	+8.3	+6.4
Farm Employment Share 1998 (percent)	4.1	8.1
Manufacturing Employment Share 1998 (percent)	21.2	17.0
Government Employment Share, Percent Change 1993-98	13.9	16.7
Agricultural Services Employment Share, Percent Change 1993-98	0.0	6.9
Mining Employment Share, Percent Change 1993-98	-17.9	-22.5
Construction Employment Share, Percent Change 1993-98	+6.3	+11.7
Transportation and Public Utilities Employment Share, Percent Change 1993-98	-0.6	+5.5
FIRE Employment Share, Percent Change 1993-98	+12.1	+2.7
Services Employment Share, Percent Change 1993-98	+3.0	+7.2

Sources: see Technical Appendix.

### Counties Categorized By Economic Experience

In 1983, ARC established a Distressed Counties program aimed at promoting development in the region’s most underdeveloped regions (Wood and Bischak 2000). It now defines counties as distressed if they meet three criteria: their three-year average unemployment rate and poverty rate exceed the national levels by 50 percent and per capita market income (PCMI, which equals income excluding transfer payments) is less than two-thirds the national level. Counties also qualify as distressed if their poverty rate is more than double the national rate and they satisfy either of the other two criteria.

ARC now defines three other levels of economic well-being above “distressed.” Competitive counties have poverty rates and three-year unemployment rates at or below the national average and PCMI of at least 80 percent of the national average. Transitional counties fall between distressed and competitive status. Attainment counties have reached or exceeded the national average by all three measures. In 1993, there were 117 distressed counties, 250 transitional counties, 26 competitive counties, and 6 attainment counties. (The remaining seven counties in the current Appalachian region were not in the region in 1993.)

Past divergence in economic success among Appalachian counties become somewhat more pronounced over the 1993 to 1998 period (Table 6 and Figure 19).

- Employment grew by about a third in attainment counties between 1993 and 1998, compared to less than 10 percent in less economically successful counties.
- By 1998, distressed county wages were about 29 percent below attainment county wages.
- Unemployment and underemployment fell more in less distressed counties.
- Labor force participation rose slightly in attainment counties between 1993 and 1998 and was nearly unchanged in other counties.

**Figure 19. Percent Change in Labor Force Indicators 1993 to 1998 in Appalachian Counties Grouped by Economic Status**



Source: Table 6.

**TABLE 6.  
FOUR COUNTY GROUPS CATEGORIZED BY ECONOMIC SUCCESS**

	<b>Distressed</b>	<b>Transitional</b>	<b>Competitive</b>	<b>Attainment</b>
Underemployment 1998 (percent)	15.0	10.3	7.4	4.4
Unemployment Rate 1998 (percent)	7.8	5.0	3.4	2.3
Labor Force Participation Rate 1998 (percent)	52.7	61.2	65.2	77.1
Underemployment, Percent Change 1993-98	-26.5	-29.2	-33.7	-40.3
Unemployment, Percent Change 1993-98	-29.3	-33.0	-39.4	-42.2
Labor Force Participation, Percent Change 1993-98	-0.1	+0.7	+0.7	+1.6
Proprietorship 1998 (percent)	22.7	18.1	14.1	17.7
Proprietorship, Percent Change 1993-98	+1.0	+2.8	+4.3	-9.1
Average Annual Wage 1998 (nominal dollars)	22,709	25,567	30,191	31,921
Average Annual Wage, Percent Change 1993-98	+19.6	+20.7	+21.4	+26.9
Total Employment, Percent Change 1993-98	+6.9	+8.1	+8.3	+33.2
Farm Employment Share 1998 (percent)	6.7	3.0	0.8	0.7
Mining Employment Share 1998 (percent)	4.3	0.8	0.3	0.2
Construction Employment Share 1998 (percent)	5.6	5.8	5.9	8.7
Manufacturing Employment Share 1998 (percent)	16.3	17.9	16.6	13.0
Wholesale Trade Employment Share 1998 (percent)	2.6	3.6	4.6	10.7
Services Employment Share 1998 (percent)	21.9	25.8	30.7	26.9
Government Employment Share 1998 (percent)	15.8	14.0	11.2	8.8
Farm Employment Share, Percent Change 1993-98	-9.0	-10.6	-12.4	-27.4
Agricultural Services Employment Share, Percent Change 1993-98	+4.8	+2.8	+22.7	+4.8
Mining Employment Share, Percent Change 1993-98	-21.3	-16.3	-7.0	+0.7
Manufacturing Employment Share, Percent Change 1993-98	-3.7	-7.8	-6.9	-7.9
Transportation & Public Utilities Employment Share, Percent Change 1993-98	+1.7	-0.7	+4.7	-0.6
Wholesale Trade Employment Share, Percent Change 1993-98	+0.3	-1.1	+1.2	-4.6
Retail Trade Employment Share, Percent Change 1993-98	+7.3	+4.5	+2.4	+5.1
FIRE Employment Share, Percent Change 1993-98	+3.9	+9.4	+7.3	+7.6
Services Employment Share, Percent Change 1993-98	+5.6	+3.7	+1.8	+4.1
Government Employment Share, Percent Change 1993-98	-3.3	-3.9	-6.1	-13.1

Sources: see Technical Appendix.

Proprietorship appears to be a response to economic distress except in the most economically successful counties. Proprietorship was highest in distressed counties, lower in transitional counties, and lower still in competitive counties. Proprietorship was almost as high in the six attainment counties as in transitional counties. Proprietorship increased the least between 1993 and 1998 in distressed counties, increased more in transitional counties, increased the most in competitive counties, and declined in attainment counties.

- Farming, government, and mining were smaller shares of employment in more economically successful counties than in less successful ones. Distressed counties, in particular, had a markedly higher mining employment share than other types of counties.
- Construction employment, on the other hand, was higher in more successful counties, probably as a consequence of faster economic growth in those counties.
- The manufacturing employment share is substantially smaller in attainment counties than in the other county categories, while the wholesale trade share is substantially larger.
- The services employment share rises with economic success up through the competitive county category, but is only slightly higher in attainment counties than in transitional counties.

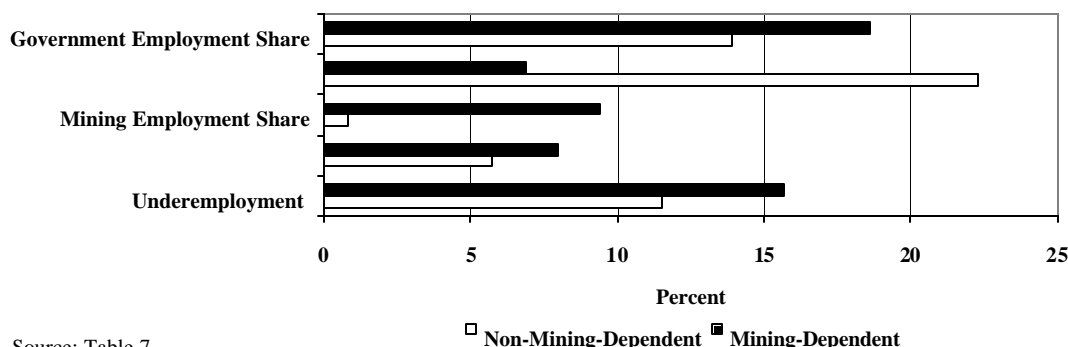
- More economically successful counties lost more farming and government employment (in relative terms) than less successful counties from 1993 to 1998, with attainment counties losing substantially more of both kinds of jobs than other counties.
- Mining employment declined more in less successful counties and was nearly unchanged in attainment counties.
- The decline in manufacturing's share of employment and the rise in FIRE's share were both considerably smaller in distressed counties than in more successful counties.
- The growth of the retail trade and services employment shares was lower in more successful counties up through the competitive category but was slightly higher in attainment counties than in transitional counties.
- The employment share of agricultural services grew much more in competitive counties than in any of the other categories.

***Mining-Dependent Non-metropolitan Counties***

We now turn to our analysis of labor market indicators in counties based on their economic base. We begin with mining-dependent counties.

Forty-one non-metropolitan counties in Appalachia are mining-dependent (i.e., mining contributed to a weighted annual average of 15 percent or more of labor and proprietor income from 1987 to 1989). The other 256 non-metropolitan Appalachian counties are not mining-dependent.

**Figure 20.  
A Profile of Mining-Dependent Counties and Non-Mining-Dependent Counties, 1998 (all figures in percent)**



Source: Table 7.

In mining-dependent counties (Table 7 and Figure 20):

- mining accounted for nearly 10 percent of total employment in 1998, compared to less than one percent in non-mining dependent counties;
- unemployment and underemployment were much higher in 1998 and lower labor-force participation much lower than in non-mining-dependent counties;
- in contrast to experience in many other groups of depressed copies, unemployment and underemployment fell faster (between 1993 and 1998) than in non-mining-dependent counties;
- wages in 1998 were about 6 percent higher than elsewhere in non-metropolitan Appalachia; and
- wages and employment grew more slowly from 1993 to 1998.

Mining-dependent counties had more government employment (as a share of the employed population) and dramatically less manufacturing employment than other counties. Mining's share of employment fell faster and FIRE's share of employment grew less in mining-dependent counties from 1993 to 1998.

**TABLE 7.  
MINING-DEPENDENT NON-METROPOLITAN COUNTIES**

	<b>Non-mining- dependent</b>	<b>Mining- dependent</b>
Underemployment 1998 (percent)	11.5	15.7
Unemployment Rate 1998 (percent)	5.7	8.0
Labor Force Participation Rate 1998 (percent)	60.1	48.3
Underemployment, Percent Change 1993-98	-25.0	-31.3
Unemployment, Percent Change 1993-98	-28.1	-34.9
Labor Force Participation, Percent Change 1993-98	-0.2	-2.3
Proprietorship 1998 (percent)	20.9	17.9
Proprietorship, Percent Change 1993-98	+1.8	+3.4
Average Annual Wage 1998 (nominal dollars)	23,757	25,239
Average Annual Wage, Percent Change 1993-98	+21.6	+16.5
Total Employment, Percent Change 1993-98	+8.4	+4.7
Mining Employment Share 1998 (percent)	0.8	9.4
Manufacturing Employment Share 1998 (percent)	22.3	6.9
Government Employment Share 1998 (percent)	13.9	18.6
Mining Employment Share, Percent Change 1993-98	-14.6	-20.1
Manufacturing Employment Share, Percent Change 1993-98	-7.1	+2.3
Wholesale Trade Employment Share, Percent Change 1993-98	+2.0	-4.9
FIRE Employment Share, Percent Change 1993-98	+11.9	+2.1

Sources: see Technical Appendix.

### *Manufacturing-Dependent Non-metropolitan Counties*

One-hundred and twenty eight non-metropolitan Appalachian counties were manufacturing-dependent counties (manufacturing contributed a weighted annual average of 30 percent or more labor and proprietor income from 1987 to 1989). The other 169 non-metropolitan counties were not manufacturing dependent. Manufacturing employment was 28 percent of total employment in manufacturing-dependent counties, compared to nearly 12 percent in non-manufacturing dependent counties (Table 8).

- In 1998, underemployment and unemployment rates were lower, and the labor force participation rate higher, in manufacturing-dependent than in non-manufacturing dependent non-metropolitan counties.
- Unemployment and underemployment rates decreased by six percentage points more in non-manufacturing dependent counties from 1993-98 than in manufacturing dependent counties. This may reflect the increasing pressure of imports on low-wage U.S. manufacturing.
- In 1998, wages in manufacturing counties were only about 3 percent higher than those in other non-metropolitan counties. This reflects the longstanding low-wage character of Appalachian manufacturing.



**TABLE 8.  
MANUFACTURING-DEPENDENT NON-METROPOLITAN COUNTIES**

	<b>Not- Manufacturing Dependent</b>	<b>Manufacturing Dependent</b>
Underemployment Rate 1998 (percent)	12.9	11.2
Unemployment Rate 1998 (percent)	6.5	5.5
Labor Force Participation Rate 1998 (percent)	55.4	61.7
Underemployment, Percent Change 1993-98	-28.8	-23.2
Unemployment, Percent Change 1993-98	-32.1	-26.3
Labor Force Participation, Percent Change 1993-98	0.0	-0.7
Farm Employment Share 1998 (percent)	5.2	4.4
Mining Employment Share 1998 (percent)	3.2	0.6
Manufacturing Employment Share 1998 (percent)	11.7	28.3
Transport and Public Utilities Employment Share 1998 (percent)	4.7	3.9
Retail Trade Employment Share 1998 (percent)	18.6	16.3
Service Employment Share 1998 (percent)	26.0	20.3
Government Employment Share 1998 (percent)	16.2	12.8
Farm Employment, Percent Change 1993-98	-10.3	-10.2
Mining Employment, Percent Change 1993-98	-20.4	-14.9
Manufacturing Employment, Percent Change 1993-98	-4.2	-7.2
Transport and Public Utilities Employment, Percent Change 1993-98	-1.9	3.1
Retail Trade Employment, Percent Change 1993-98	6.4	5.4
Service Employment, Percent Change 1993-98	2.2	5.2
Government Employment, Percent Change 1993-98	-2.6	-3.2
Total Employment, Percent Change 1993-98	8.3	7.7
Average Annual Wage 1998 (nominal dollars)	23,500	24,295
Average Annual Wage, Percent Change 1993-98	19.5	22.1
Average Annual Wage 1993 (nominal dollars)	19,659	19,899

Sources: see Technical Appendix.

### ***Farming-Dependent Non-metropolitan Counties***

Six non-metropolitan Appalachian counties were farming-dependent defined as farming contributing a weighted annual average of 20 percent or more labor and proprietor income over the three years from 1987 to 1989. Two hundred and ninety counties were non-farming-dependent

Underemployment and unemployment *rose* about 10 percent in farming-dependent counties between 1993 and 1998 while they fell by more than a quarter elsewhere (Table 9). While in 1993, underemployment in farming-dependent counties had been much lower—11.8 versus 16.3 percent—by 1998 underemployment was a percentage point higher in farming-dependent counties compared to non-farming dependent counties. For unemployment, a farming-dependent county advantage of 6.6 percent vs. 8.4 percentage became a disadvantage of 7.2 versus 5.9 percent by 1998.

Behind the deteriorating labor market situation in farming-dependent Appalachia lay a nearly 10 percent decline in farming employment. In addition, manufacturing employment dropped 15 percent, possibly a reflection of drop offs in food processing linked with manufacturing. (Since our data set does not have

two-digit manufacturing employment, we cannot confirm this hypothesis.) Employment overall grew by 8 percent in non-farming dependent non-metropolitan Appalachian counties, while remaining essentially unchanged in farming-dependent counties.

There are more almost twice as many proprietors as a share of the working population in farming-dependent counties, with nearly two out of five employed people classified as proprietors.

In 1998, wages were about 24 percent lower in farming-dependent counties than in the rest of non-metropolitan Appalachia.

**TABLE 9.  
FARMING-DEPENDENT NON-METROPOLITAN COUNTIES**

	<b>Non-farming-dependent</b>	<b>Farming-dependent</b>
Underemployment 1998 (percent)	12.0	12.9
Unemployment Rate 1998 (percent)	5.9	7.2
Labor Force Participation Rate 1998 (percent)	58.5	58.7
Underemployment, Percent Change 1993-98	-26.6	+9.6
Unemployment, Percent Change 1993-98	-29.7	+9.6
Labor Force Participation, Percent Change 1993-98	-0.3	-3.2
Proprietorship 1998 (percent)	20.4	37.6
Proprietorship, Percent Change 1993-98	+2.0	+0.7
Average Annual Wage 1998 (nominal dollars)	23,957	18,247
Average Annual Wage, Percent Change 1993-98	+20.9	+23.9
Total Employment, Percent Change 1993-98	+8.0	+0.9
Farm Employment Share 1998 (percent)	4.7	22.7
Retail Trade Employment Share 1998 (percent)	17.4	14.3
Services Employment Share 1998 (percent)	23.0	15.3
Farm Employment Share, Percent Change 1993-98	-10.1	-9.1
Retail Trade Employment Share, Percent Change 1993-98	+5.9	+15.8
Services Employment Share, Percent Change 1993-98	+3.5	+10.1
Agricultural Services Employment Share, Percent Change 1993-98	+1.5	-48.7
Mining Employment Share, Percent Change 1993-98	-19.4	+11.9
Construction Employment Share, Percent Change 1993-98	+7.1	+21.4
Manufacturing Employment Share, Percent Change 1993-98	-6.5	-15.3
Transportation & Public Utilities Employment Share, Percent Change 1993-98	+0.4	+10.8
FIRE Employment Share, Percent Change 1993-98	+10.8	+4.8

Sources: see Technical Appendix.

### *Service Dependent Non-metropolitan Counties*

Thirty-two non-metropolitan Appalachian counties qualified as service-dependent because service activities contributed to a weighted annual average of 50 percent or more labor and proprietor income over the three years from 1987 to 1989. Two-hundred and sixty five counties did not meet this standard.

No major contrasts in labor market performance exist between service dependent and non-service dependent counties (Table 10).

In non-service dependent counties, the share of manufacturing employment in total employment was over two times the share in service dependent counties in 1998. In service dependent counties, retail and FIRE employment, as well as service employment, were significantly higher than in non-service dependent counties in 1998. Wages in service-dependent counties were about 3 percent above those in other non-metropolitan counties.

<b>TABLE 10.</b>		
<b>SERVICE DEPENDENT NON-METROPOLITAN COUNTIES</b>		
	<b>Non-Services Dependent</b>	<b>Services Dependent</b>
Underemployment Rate 1998 (percent)	12.0	12.4
Unemployment Rate 1998 (percent)	5.9	6.4
Labor Force Participation Rate 1998 (percent)	58.7	57.1
Underemployment, Percent Change 1993-98	-29.8	-27.7
Unemployment, Percent Change 1993-98	-0.3	-0.7
Labor Force Participation, Percent Change 1993-98	-26.5	-25.6
Farm Employment Share 1998 (percent)	5.1	3.1
Mining Employment Share 1998 (percent)	1.9	1.1
Manufacturing Employment Share 1998 (percent)	22.4	10.4
Retail Employment Share 1998 (percent)	17.0	19.8
FIRE Employment Share 1998 (percent)	4.0	5.4
Services Employment Share 1998 (percent)	21.4	31.4
Government Employment Share 1998 (percent)	14.5	13.8
Farm Employment, Percent Change 1993-98	-10.1	-11.0
Mining Employment, Percent Change 1993-98	-19.9	-13.5
Manufacturing Employment, Percent Change 1993-98	-6.5	-7.1
Retail Employment, Percent Change 1993-98	5.8	6.6
FIRE Employment, Percent Change 1993-98	10.2	13.1
Services Employment, Percent Change 1993-98	5.0	-1.3
Government Employment, Percent Change 1993-98	-3.1	-1.3
Total Employment, Percent Change 1993-98	7.9	8.4
Average Annual Wage 1998 (nominal dollars)	23,811	24,561
Average Annual Wage 1993 (nominal dollars)	19,659	20,511
Average Annual Wage, Percent Change 1993-98	21.1	19.7

Sources: see Technical Appendix.

### ***Government-Dependent Non-metropolitan Counties***

Twenty-four non-metropolitan Appalachian counties were classified as government-dependent, because government activities contributed to a weighted annual average of 25 percent or more labor and proprietor income from 1987 to 1989. Two-hundred and seventy-three counties were not government-dependent.

- In 1998, government-dependent counties had slightly lower unemployment and underemployment, and substantially lower labor force participation rates, than other non-metropolitan counties (Table 11).

- Underemployment and unemployment fell in both types of counties at similar rates during 1993-98.
- Government-dependent counties experienced a slight increase in labor force participation, while other counties experienced virtually no change in labor force participation.
- Proprietorship was very slightly higher in government-dependent counties, although it rose very slightly less in those counties between 1993 and 1998.
- Wages grew more slowly in government-dependent counties but employment grew faster in those counties.
- In 1998, wages in government-dependent counties were about 13 percent lower than those in other non-metropolitan counties. Government-dependent counties had much less manufacturing employment and much more government employment than other counties.

**TABLE 11.**  
**GOVERNMENT-DEPENDENT NON-METROPOLITAN COUNTIES**

	<b>Non- Government- dependent</b>	<b>Government- dependent</b>
Underemployment 1998 (percent)	12.1	11.7
Unemployment Rate 1998 (percent)	6.0	5.7
Labor Force Participation Rate 1998 (percent)	58.7	54.2
Underemployment, Percent Change 1993-98	-26.4	-25.5
Unemployment, Percent Change 1993-98	-29.5	-29.5
Labor Force Participation, Percent Change 1993-98	-0.4	+1.8
Proprietorship 1998 (percent)	20.5	22.9
Proprietorship, Percent Change 1993-98	+2.0	+1.8
Average Annual Wage 1998 (nominal dollars)	24,052	20,810
Average Annual Wage, Percent Change 1993-98	+20.9	+19.9
Total Employment, Percent Change 1993-98	+7.9	+8.4
Manufacturing Employment Share 1998 (percent)	21.0	8.9
Government Employment Share 1998 (percent)	13.9	26.7
Manufacturing Employment Share, Percent Change 1993-98	-6.5	-9.2
Government Employment Share, Percent Change 1993-98	-2.7	-4.7
Agricultural Services Employment Share, Percent Change 1993-98	+0.8	+8.7
Mining Employment Share, Percent Change 1993-98	-19.5	-12.2
Transportation & Public Utilities Employment Share, Percent Change 1993-98	+0.6	-4.8
Wholesale Trade Employment Share, Percent Change 1993-98	+1.5	-10.4
FIRE Employment Share, Percent Change 1993-98	+11.0	+4.3

Sources: see Technical Appendix.

### *Non-specialized Non-metropolitan Counties*

Sixty-five non-metropolitan counties Appalachian counties fell into no specialized economic type from 1987 to 1989. Two hundred and thirty-two others did fall into a specialized category.

- Non-specialized counties had slightly lower unemployment and underemployment rates and a slightly higher labor force participation rate than other non-metropolitan counties (Table 12).
- Unemployment and underemployment fell more in non-specialized counties, and labor force participation increased more between 1993 and 1998 in non-specialized counties.
- Proprietorship is substantially higher in non-specialized counties.
- Employment grew more and wages rose slightly more in non-specialized counties.

- In 1998, wages were still about 9 percent lower in non-specialized counties than in other non-metropolitan counties.

<b>TABLE 12.</b>		
<b>NON-SPECIALIZED NON-METROPOLITAN COUNTIES</b>		
	<b>Not Non-specialized</b>	<b>Non-specialized</b>
Underemployment 1998 (percent)	12.2	11.2
Unemployment Rate 1998 (percent)	6.0	5.6
Labor Force Participation Rate 1998 (percent)	58.2	59.8
Underemployment, Percent Change 1993-98	-25.6	-30.2
Unemployment, Percent Change 1993-98	-28.5	-34.2
Labor Force Participation, Percent Change 1993-98	-0.7	+1.6
Proprietorship 1998 (percent)	19.6	25.5
Proprietorship, Percent Change 1993-98	+2.5	-0.9
Average Annual Wage 1998 (nominal dollars)	24,259	22,095
Average Annual Wage, Percent Change 1993-98	20.7	22.3
Total Employment, Percent Change 1993-98	7.4	11.3
Farm Employment Share 1998 (percent)	4.2	7.9
Manufacturing Employment Share 1998 (percent)	21.2	17.0

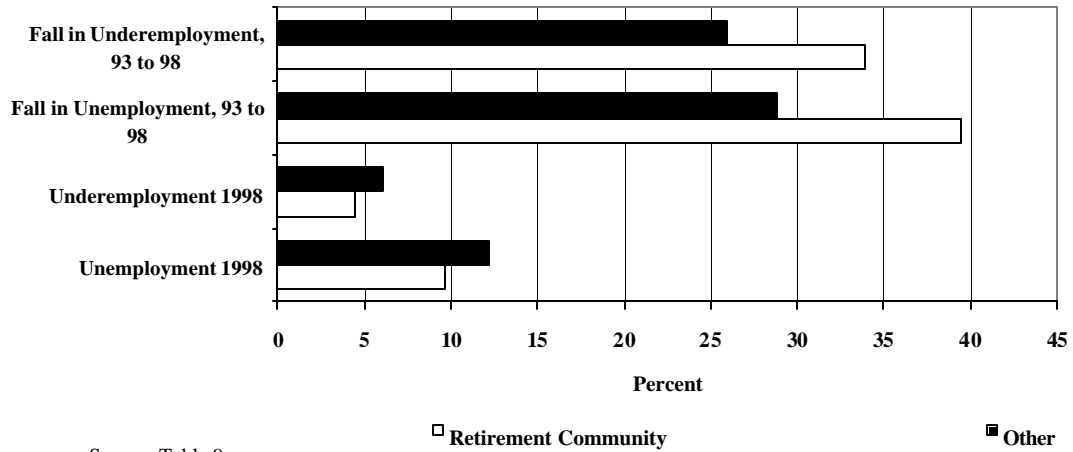
Sources: see Technical Appendix.

### *Retirement Community Non-metropolitan Counties*

The Economic Research Service of the Department of Agriculture defined retirement community counties as those in which the population aged 60 years increased by 15 percent or more from 1980 to 1990 due to the movement of people. Appalachia had 19 retirement community counties and 278 non-retirement community counties

- The 1998 unemployment rate was 4.5 percent in retirement counties compared to 6.1 percent in non-retirement counties (Table 13 and Figure 21).
- The underemployment rate was 2.5 percentage points lower in retirement counties.
- Retirement counties saw larger drops in underemployment and unemployment rates from 1993 to 1998.
- Overall employment growth in retirement community counties was about twice the employment growth in non-retirement community counties (16 percent versus 7.5 percent).
- Farming, mining, and combined were about 8 percentage points higher in non-retirement community counties in 1998 – 28 percent against 20 percent.
- FIRE, services, and retail employment are each 2-3 percentage points higher in retirement communities, with FIRE growing very rapidly recently. Thus is consistent with the hypothesis that, to attract retirees, non-metropolitan Appalachian counties must have basic amenities and services that the elderly desire.
- In 1998, retirement destination county wages were about 1 percent below those in other non-metropolitan counties.

**Figure 21. Unemployment and Underemployment in Retirement Counties and Other Non-metropolitan Appalachian Counties**



Source: Table 9.

	<b>Non-Retirement Community</b>	<b>Retirement Community</b>
Underemployment Rate 1998 (percent)	12.2	9.7
Unemployment Rate 1998 (percent)	6.1	4.5
Labor Force Participation Rate 1998 (percent)	58.6	57.3
Underemployment, percent Change 1993-98	-25.9	-33.9
Unemployment, percent Change 1993-98	-28.8	-39.5
Labor Force Participation, percent Change 1993-98	-0.2	-1.7
Farm Employment as a percent of Total 1998	5.0	2.7
Mining Employment as a percent of Total 1998	1.9	0.4
Construction Employment as a percent of Total 1998	5.3	8.3
Manufacturing Employment Share 1998 (percent)	20.8	17.0
Retail Trade Employment Share 1998 (percent)	17.3	19.1
FIRE Employment Share 1998 (percent)	4.1	6.5
Service Employment Share 1998 (percent)	22.8	25.2
Government Employment Share 1998 (percent)	14.5	13.2
Proprietorship Employment Share 1998 (percent)	20.4	22.8
Farm Employment, percent Change 1993-98	-9.8	-18.1
Mining Employment, percent Change 1993-98	-19.4	9.7
Construction Employment, percent Change 1993-98	7.2	4.1
Manufacturing Employment, percent Change 1993-98	-6.4	-8.1
Retail Trade Employment, percent Change 1993-98	5.9	6.2
FIRE Employment, percent Change 1993-98	9.0	28.1
Service Employment, percent Change 1993-98	3.9	-0.5
Government Employment, percent Change 1993-98	-2.7	-5.6
Proprietorship Employment, percent Change 1993-98	1.9	2.2
Average Annual Wage 1998 (nominal dollars)	23,942	23,650
Average Annual Wage, Percent Change 1993-98	20.8	22.5
Average Annual Wage 1993 (nominal dollars)	19,817	19,301

Sources: see Technical Appendix.

### *Commuting Non-metropolitan Counties*

Commuting counties were defined as those in which 40 percent or more of the county's workers aged 16 years and over commuted to jobs outside their county of residence in 1990. Appalachia included 226 commuting non-metropolitan counties and 71 non-commuting non-metropolitan counties

- Commuting counties had slightly lower unemployment and underemployment rates, possibly reflecting the availability of job opportunities within a multi-county regional economy (Table 14).
- The decline in unemployment and underemployment between 1993 and 1998 was slightly larger in commuting counties.
- The proprietorship rate was much higher in commuting counties. This raises the possibility that people with service businesses – broadly defined, and including professional partnerships that serve residential populations – more often set them up near where they live.

- Commuting counties had slightly faster wage growth and much faster employment growth during 1993-98.
- In 1998, commuting county wages were about 7 percent below those in other non-metropolitan counties.
- Manufacturing, services, and retail trade each accounted for a lower share of employment in commuting counties.
- The employment shares of construction; transportation and public utilities; and finance, insurance, and real estate all grew much faster in commuting counties.

**TABLE 14.**  
**COMMUTING NON-METROPOLITAN COUNTIES**

	<b>Non- commuting</b>	<b>Commuting</b>
Underemployment 1998 (percent)	12.2	11.2
Unemployment Rate 1998 (percent)	6.0	5.5
Labor Force Participation Rate 1998 (percent)	58.4	59.1
Underemployment, Percent Change 1993-98	-25.8	-30.3
Unemployment, Percent Change 1993-98	-28.7	-34.4
Labor Force Participation, Percent Change 1993-98	-0.5	+0.5
Proprietorship 1998 (percent)	19.6	28.4
Proprietorship, Percent Change 1993-98	+2.0	+0.3
Average Annual Wage 1998 (nominal dollars)	24,103	22,407
Average Annual Wage, Percent Change 1993-98	+20.9	+21.8
Total Employment, Percent Change 1993-98	+7.5	+12.5
Manufacturing Employment Share 1998 (percent)	20.8	18.9
Retail Trade Employment Share 1998 (percent)	17.6	15.2
Services Employment Share 1998 (percent)	23.2	20.3
Construction Employment Share, Percent Change 1993-98	+6.6	+10.4
Transportation and Public Utilities Employment Share, Percent Change 1993-98	-0.0	+5.9
FIRE Employment Share, Percent Change 1993-98	+9.4	+25.8

Sources: see Technical Appendix.

### *Transfer Dependent Non-metropolitan Counties*

From 1987 to 1989, in 91 non-metropolitan Appalachian counties, income from transfer payments contributed a weighted annual average of 25 percent or more total personal income. Two hundred and six counties received less income from transfers.

- Underemployment and unemployment rates were significantly higher and labor force participation significantly lower in transfer dependent counties in 1998 (Table 15).
- As a percentage of total employment, mining employment was substantially higher and manufacturing employment was significantly lower in transfer dependent counties than in non-transfer dependent counties in 1998.
- Starting from similar bases in 1993, FIRE employment in transfer dependent counties rose moderately while it increased more substantially in non-transfer counties through 1998.



**TABLE 15.  
TRANSFER-DEPENDENT NON-METROPOLITAN COUNTIES**

	<b>Not-Transfer Dependent</b>	<b>Transfer Dependent</b>
Underemployment Rate 1998 (percent)	11.1	15.4
Unemployment Rate 1998 (percent)	5.5	8.1
Labor Force Participation Rate 1998 (percent)	60.7	50.4
Underemployment, percent Change 1993-98	-25.7	-27.7
Unemployment, percent Change 1993-98	-28.9	-30.5
Labor Force Participation, percent Change 1993-98	-0.4	-0.3
Farm Employment as percent Total 1998	4.6	5.8
Mining Employment as percent Total 1998	1.2	4.5
Manufacturing Employment as percent Total 1998	22.6	11.2
Transport and Public Utilities Employment as percent Total 1998	4.0	5.1
Wholesale Trade Employment as percent Total 1998	2.9	2.5
Retail Trade Employment as percent Total 1998	17.3	18.0
FIRE Employment as percent Total 1998	4.3	3.8
Services Employment as percent Total 1998	22.5	24.8
Government Employment as percent Total 1998	13.7	17.8
Farm Employment, percent Change 1993-98	-10.4	-9.3
Mining Employment, percent Change 1993-98	-17.0	-21.3
Manufacturing Employment, percent Change 1993-98	-7.0	-3.6
Transport and Public Utilities Employment, percent Change 1993-98	0.8	-0.5
Wholesale Trade Employment, percent Change 1993-98	2.0	-3.2
Retail Trade Employment, percent Change 1993-98	6.1	5.2
FIRE Employment, percent Change 1993-98	11.9	4.9
Services Employment, percent Change 1993-98	3.3	5.1
Government Employment, percent Change 1993-98	-2.5	-3.8
Total Employment, percent Change 1993-98	8.3	6.6
Average Annual Wage 1998 (nominal dollars)	24,130	22,958
Average Annual Wage, Percent Change 1993-98	21.3	19.2
Average Annual Wage 1993 (nominal dollars)	19,900	19,267

Sources: see Technical Appendix.

- In 1998 government employment as a share of total employment was significantly higher in transfer dependent counties than in non-transfer dependent counties
- In 1998, wages in transfer-dependent counties were about 5 percent below those in other non-metropolitan counties.

### ***Federal Lands Non-metropolitan Counties***

In 24 non-metropolitan Appalachian counties, federally-owned lands made up 30 percent or more of a county's land area in the year 1987. Two hundred and seventy three non-metropolitan counties did not meet this criterion.

In most respects, federal lands counties resemble other non-metropolitan counties (Table 16).

- Wages in 1998 were about 7 percent lower in federal lands counties than in other non-metropolitan counties.
- Employment rose more in federal lands counties from 1993 to 1998, led by increases in FIRE, construction, and mining.
- Both farm and manufacturing employment fell more in federal lands counties during 1993-98.

**TABLE 16.  
FEDERAL LANDS NON-METROPOLITAN COUNTIES**

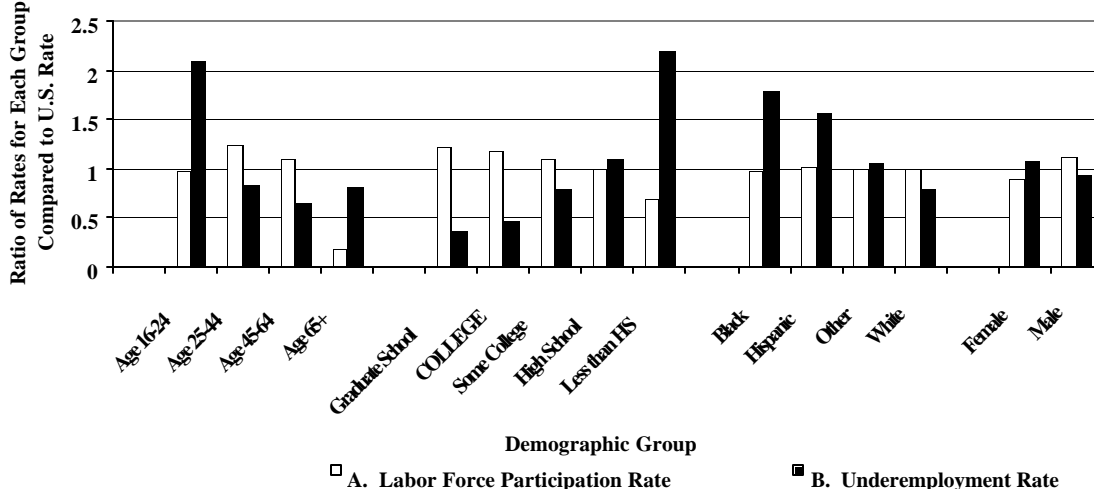
	<b>Not Federal Lands</b>	<b>Federal Lands</b>
Underemployment 1998 (percent)	12.1	11.7
Unemployment Rate 1998 (percent)	6.0	5.6
Labor Force Participation Rate 1998 (percent)	58.5	57.9
Underemployment, Percent Change 1993-98	-26.3	-27.2
Unemployment, Percent Change 1993-98	-29.4	-31.7
Labor Force Participation, Percent Change 1993-98	-0.3	-0.2
Proprietorship 1998 (percent)	20.4	23.7
Proprietorship, Percent Change 1993-98	+1.9	+3.3
Average Annual Wage 1998 (nominal dollars)	23,990	22,359
Average Annual Wage, Percent Change 1993-98	+20.9	+21.4
Total Employment, Percent Change 1993-98	+7.8	+13.2
Construction Employment Share 1998 (percent)	5.4	8.3
Manufacturing Employment Share 1998 (percent)	20.7	17.8
Farm Employment Share, Percent Change 1993-98	-10.0	-14.6
Mining Employment Share, Percent Change 1993-98	-19.5	+21.1
Construction Employment Share, Percent Change 1993-98	+6.8	+11.7
Manufacturing Employment Share, Percent Change 1993-98	-6.3	-11.6
Transportation & Public Utilities Employment Share, Percent Change 1993-98	+0.7	-5.0
Wholesale Trade Employment Share, Percent Change 1993-98	+1.4	-3.8
FIRE Employment Share, Percent Change 1993-98	+10.1	+26.5

Sources: see Technical Appendix.

### ***Labor Market Performance and Employment Patterns Among Demographic Groups***

We now turn to variations in labor market indicators and industry employment patterns by demographic group. Figure 22 shows how labor force participation and underemployment vary by age, educational attainment, gender, and race/ethnicity. Table A7 includes the data behind Figure 22 along with unemployment and industrial employment patterns by demographic group. (The data in Figure 22 and Table A7 are for the United States as a whole, since there is no straightforward way to obtain data for Appalachia alone. See the Technical Appendix.)

**Figure 22.**  
**Labor Force Participation and Underemployment Rates by**  
**Demographic Group (Compared to Overall U.S. Rates)**



Source: Table A7.

Prime age workers (25-64) have higher than average labor force participation rates and lower than average unemployment and underemployment rates; 45-64 year olds, in particular, have unemployment and underemployment rates well below the national average. Young workers 16-24 have unemployment and underemployment rates well above the national average. Of special relevance to Appalachia, workers with a high school education or less also have lower rates of labor force participation and higher rates of unemployment and underemployment.

Turning to industry employment patterns, young, less educated, minority workers tend to occupy higher than average shares of employment in traditionally low-paid, low-skill sectors. Those with less than a high school degree are employed in farming, agriculture, and retail trade at rates well above the national average. Workers with a high school degree or less are also more likely to be employed in manufacturing and construction. On the other hand, those with college degrees or above are more likely to be employed in the higher paying service and government sectors.

Appalachia’s low levels of education, high rates of unemployment and underemployment, and dependence on low-skill farming, extractive industries, and manufacturing may be mutually reinforcing. The strategic question is how poor areas can break out of traditional cycles of low levels of education and employer reliance on low-skill strategies.

**SUCCESSFUL AND UNSUCCESSFUL LOCAL DEVELOPMENT DISTRICTS**

In this section, we look at the experience of local development districts with unusually poor or unusually good labor market performance. We begin by looking at 10 districts that have the highest underemployment. We then turn to the 10 districts with the lowest underemployment. For low underemployment districts, we complement our statistical analysis with interviews with practitioners.

### ***Bottom 10 Local Development Districts Ranked by Highest Underemployment***

All of the bottom 10 districts ranked by highest underemployment had underemployment and unemployment rates at least about 50 percent above the U.S. average (Table A8). Four of these districts are in West Virginia, three are in Kentucky, two are in Virginia, and one is in Mississippi.

- Labor force participation rates in all bottom 10 districts are at least 10 percentage points below the national average, ranging from 48 to 58 percent.
- The proprietors' employment share is near or below the national average for half of the 10 districts and at least 29 percent above the national average in the other half of the districts. One district—in Kentucky—had a 42 percent proprietor employment share in 1998.
- All but two bottom 10 districts experienced declines in underemployment and unemployment rates from 1993 to 1998.
- While overall employment increased in nine of the 10 districts, labor force participation declined in all 10 districts from 1993 to 1998. This decline may reflect an aging population, which can drive down labor force participation as we have defined it even if unemployment falls. In addition, although young people tend to leave declining LDDs – further aging the population – the entry into the labor force of the offspring of post-World War II baby boomers (“the baby boomlet”) contributes to employment expansion.

Uniformity in industrial structure was the hallmark of the bottom 10 LDDs.

- All but one of the bottom 10 districts has a higher than average share of employment in farming, with one district in Kentucky having a 25 percent share (Table A9).
- Seven of the 10 districts have much larger shares of employment in mining than the rest of Appalachia or the United States as a whole.
- The manufacturing share of total employment is only higher than the Appalachian average in two of the 10 districts and all but one district has lower than average wholesale trade employment.
- All bottom 10 districts have below average employment shares in finance, insurance, and real estate employment.
- Finally, seven of the 10 districts have higher than average shares of employment in government.

There was also considerable uniformity with respect to changes in industrial composition from 1993 to 1998.

- Six of the 10 districts experienced larger than average decreases in manufacturing employment (Table A10).
- All 10 of these districts experienced higher than average growth in retail trade employment, with half of the districts having increases at least twice the Appalachian average.
- Compared to a rise of 8.5 percent and 1.8 percent in FIRE in Appalachia and the United States, respectively, seven of these districts experienced declines in employment in this sector (between -1.5 percent and -9.3 percent) from 1993-98.
- Finally, nine of the 10 districts in this group had above average growth in services employment.

### ***Top 10 Local Development Districts***

All of the top 10 local development districts ranked by the lowest underemployment rates had both underemployment and unemployment rates below the U.S. average (Table A11). In these districts:

- underemployment in 1998 ranged from 4.3 percent to 7.2 percent, compared to the U.S. average of 8.6 percent;
- unemployment ranged from 2.6 to 3.2 percent;
- labor force participation and proprietorship in these counties vary widely around the U.S. averages for these variables.
- all 10 of these low-unemployment LDDs are in the South, with three in North Carolina, two each in Georgia, Alabama, and Virginia, and one in South Carolina.

While industrial uniformity is the hallmark of the bottom 10 LDDs, the industrial composition of the top 10 LDDs varies widely (Table A12). There is clearly more than one route to economic success in Appalachia.

- One of these LDDs – in North Carolina – has a 39.1 percent share of total employment in manufacturing. Two others have manufacturing employment at least four percentage points above the Appalachian average.
- Four have manufacturing employment shares at least three percentage points below the Appalachian average.
- One LDD has a 10.2 percent share of total employment in farming, which is about five times the Appalachian average and four times the U.S. average.
- One district in Georgia has an 11.2 percent share of employment in wholesale trade, three times as high as the national and Appalachian averages.
- Government employment ranges from less than two thirds of the U.S. and Appalachian average to nearly 50 percent more than these averages.
- Changes in industrial composition in the 1993-98 period in the top 10 LDDs do not follow any simple pattern (Table A13).

### *Findings from Interviews with Practitioners*

To learn more about what explains economic success within Appalachia, we conducted telephone interviews with eight practitioners in top-performing LDDs, ranked by low underemployment and unemployment.<sup>6</sup> These practitioners all came from the South: two each in Georgia, North Carolina, and Virginia, and one each in Alabama and South Carolina.

We initiated our interviews by asking an open-ended question – “what accounts for your district’s economic success?” Unlike surveys, open-ended questions do not require respondents to choose one of a pre-specified set of answers, thereby imposing conceptual categories on the person interviewed. Open-ended questions allow those interviewed to use the concepts and terms that help them to make sense of their situation.

In response to our opening question, virtually all respondents provided information on whether their district fell partly in or near a metropolitan area, on the industries concentrated in their district, and on the district transportation and educational infrastructure. In some cases, respondents also provided information on the role of state policy, and local economic development strategy, in district success. When respondents phrased answer in very general terms, we asked them to elaborate their answers and illustrate their points with examples.

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<sup>6</sup> When we could not reach a practitioner in some of our top 10 districts, to increase our sample, we included the 11<sup>th</sup> and 12<sup>th</sup> place LDDs ranked by lowest underemployment.

The interviews uncovered several themes. Five of the eight LDDs from which we interviewed practitioners are predominantly metropolitan, whereas only a little more than a quarter of all counties in Appalachia are metropolitan. One practitioner, asked to explain his area's success, said simply "Atlanta." In this and other cases, economic success flowed directly out of the growth of a metropolitan area encompassing all or part of the district.

Another common theme was transportation infrastructure. In the metropolitan areas, respondents mentioned the links interstate highways provided to a larger regional economy. In one metropolitan and one largely non-metropolitan region, a regional airport was also noted as critical to success.

Five of the eight practitioners highlighted manufacturing as a central contributor to regional success. Three of five manufacturing-focused LDDs said their district had made some effort to attract higher-end manufacturing. Two practitioners acknowledged the vulnerability of their traditional manufacturing, in particular the textiles industry, to competition from low-wage economies. Two other interviewees said most textiles jobs had already left their district.

All but one of those interviewed volunteered that local educational and technical institutions helped explain regional success. In several cases, interviewees emphasized the capacity of local technical schools to meet the customized needs of manufacturing employers. In North Carolina, especially, this partly reflects the state's well-funded community colleges. North Carolina invests twice as much per capita in community colleges as the national average (Herzenberg 2000).

About half of the districts spoke about regional planning or the development of explicit strategies in response to state and federal planning requirements built into economic development programs. A couple of practitioners saw the development of a strategic plan, with key local actors involved in developing the plan, as providing an important potential boost to regional economic development. They described it as a way to improve coordination among local development agencies and educational institutions, with broad participation in the development of the plan getting key local actors "singing from the same sheet of music." For example, the New River Valley Planning District Commission, in Virginia, fostered links between local technical colleges and a major university in the area to allow for easier transfer into computer engineering programs. The Central Shenandoah Region, also in Virginia, identified 14 "Strategic Initiatives" out of a series of five strategic planning workshops. The top two initiatives were using eco-friendly regional land use and "smart growth" policies to preserve the region's natural beauty and quality of life; and building on secondary and higher education programs that can meet the skill needs of targeted business sectors.

Despite some discussion of strategic planning, interviewees gave the impression that an explicit regional strategy had not yet played a large role in these districts' success. The districts instead have benefited mostly from good fortune—being in the right location.

Implicitly, the practitioners we spoke with articulated a "second generation" economic development strategy different from classic "first generation" Southern development strategy of recruiting low-wage employers. In the "second generation" approach, recruiting manufacturers was still seen as important—although more often higher-wage employers—with business subsidies one important recruitment tool (except, we were told, in North Carolina). The second generation approach also recognized the importance of government investment in public goods that serve all or many industries (transportation infrastructure, higher education). There was little evidence that practitioners perceived a role for economic development agencies in shifting whole industries toward "high road" (high-wage, high-productivity, high-skill) competitive strategies. Without such a "third generation" economic development approach, serious questions exist regarding how well Appalachia, particularly

manufacturing-dependent non-metropolitan counties, will withstand competition from Mexico, China, and other low-wage countries. We return to this issue in the conclusion.

**BOX: BEHIND THE SUCCESS OF LOW UNDEREMPLOYMENT LDDS**

LDD 2D. Cherokee, Douglas, and Gwinnett Counties in Georgia. District has now become part of metropolitan Atlanta. As a consequence, the population of Gwinnett tripled between 1980 to 1999, from 166,000 to 523, 000. The three counties together now have a population of 750,000 compared to 270,000 in 1980. Interstate 85 hooks this LDD up with South and North Carolina. Its job base was originally warehousing. Wholesale trade remains over 11 percent of employment, almost two-and-a-half times the U.S. average. Local government has aggressively pursued commercial development, with Gwinnett seeking to become an independent job base, separate from its commuter status. The region has also expanded high technology within the “northern crescent” outside Atlanta. Gwinnett Tech. is considered a high quality source of technical labor, although much skilled labor is still in-migration. Continuing investment in infrastructure is necessary to support the region’s rapid growth. It is now difficult to fill low-wage jobs in the region. There is no easy way for inner city residents to reverse commute to outlying suburbs.

LDD 7I. Surry, Davie, Forsyth, Stokes, Yadkin in North Carolina. All but Surry County fall into the Winston-Salem metropolitan. Surry is a manufacturing-dependent county. Winston-Salem is growing rapidly although not as fast as Raleigh or Charlotte. I40 going East-West and I77 going North-South link district with regional economy. Winston-Salem is the headquarters of Wachovia Bank and substantial insurance also exists in the city. Industrial parks with light manufacturing dot the freeway, as reflected in a nearly 20 percent manufacturing employment share. There have been textile layoffs in Surry. Some concern also exists regarding the future of the tobacco industry but farming is not a disproportionate share of employment in the district.

LDD 10A. Anderson, Cherokee, Greenville, Oconee, Pickens, Spartanburg in South Carolina. All except Oconee fall within the Greenville metropolitan area. Oconee is adjacent to the metropolitan area, as well as a manufacturing-dependent county and a retirement destination. This LDD falls halfway between Charlotte and Atlanta, with I85 linking it to the regional economy. Clemson University is in Pickens County. The technical education system is considered very good, with customized programs established to train people for local employers. This is understood to be one reason the area has successfully attracted foreign investment, including Michelin’s U.S. headquarters in Greenville and a BMW plant in Spartanburg. There is a regional approach to development that mitigates competition among counties. The textile industry in the area has experienced difficulty.

LDD 12F. Bath, Highland, Rockbridge – Central Shenandoah Valley, Virginia (one of the top 12 LDDs measured by underemployment; top 10 ranked by lowest unemployment). This is an unusual successful LDD, with both Bath and Highland being completely rural counties, not adjacent to a metropolitan area (Beale Code = 9) and Rockbridge being a non-metropolitan area with an urban population below 20,000 (Beale Code = 6). Bath is transfer-dependent, Highland farming-dependent, and Rockbridge a commuting county. This region has very low unemployment but somewhat higher underemployment. It views its strengths as natural beauty and a high quality of life. Its perceived weaknesses include low wages, poor transportation links to rural areas, and workforce quality. The region regards pollution, sprawl and poorly planned growth as threats. The region engaged in a comprehensive strategic planning effort in 2000. The top 3 of 14 identified strategic initiatives were promoting the quality of life and “eco-friendly” land use policies, workforce development which supports targeted business sectors, and improving the region’s technology and telecommunications infrastructure.

LDD 7E. Alexander, Burke, Caldwell – North Carolina. These counties fall in the Hickory metropolitan area. The LDD has a large manufacturing sector that includes furniture, textiles, fiber optics. (From 1999 to 2001, this LDD was hit very hard by manufacturing job loss.) Local government does not use many incentives to attract companies. The North Carolina Department of Commerce requires companies that receive public money to pay specified wage levels – as high as \$13.50 for some kinds of assistance. Utilities are cheap and the area has an airport, the Hickory Regional Airport, that ARC funding helped keep open. The area takes a regional approach to development

LDD 1H. Elmore County, Alabama. Elmore County is just north of Montgomery Alabama and falls within the metropolitan area. The counties to the East and West of Montgomery are heavily African-American and the south of the city is owned primarily by a wealthy landowner who will not develop the area. White suburban population growth has thus been concentrated in Elmore, which has cheaper housing and lower taxes than Montgomery. Many people commute from Elmore to a military base in Montgomery. The population concentrates in the Southwest and Southeast of the County with no good east-west road across the county. Under Alabama law, counties have little planning authority, unlike cities. This restricts district ability to pursue sound land use policies.

LDD 2B. Thirteen Counties in Northeast Georgia. Total population 425,000, including 220,000 in Forsyth and Hall counties, which are the closest to Atlanta. The population of Forsyth County grew by an estimated 10,000 in 1999 alone (about 12 percent). All of the 13 counties except Forsyth are non-metropolitan, with four having Beale Code = 9, three Beale Code = 8, three Beale Code = 7, and two Beale Code = 6. Six of the 13 counties are retirement destinations, five are commuting counties, and four are manufacturing-dependent. The three largest manufacturing employers in Hall County (the largest manufacturing-dependent county) are chicken poultry processors that employ nearly 4,000 people between them. The second largest manufacturer in Forsyth is Tyson Foods, employing 1,400. The region now seeks to attract jobs in electronics and high tech, with considerable success. Textiles have gone to Mexico. The region benefited from a comprehensive statewide economic development program, including a requirement that each locality develop a plan. It also benefited from the “One Georgia” program aimed at rural areas and from a unified state policy on water, recycling and the environment. The region has a strong system of technical schools which aid new industries.

LDD 12D. Floyd, Giles, Montgomery, Pulaski, Virginia. All non-metropolitan counties, with only Montgomery having an urban population of more than 20,000. All counties but Floyd are manufacturing-dependent. Manufacturing includes cigarettes, truck manufacturing (Volvo plant in Pulaski), fiberglass truck front ends, furniture manufacturing, some fiber optics. Most textile manufacturers have left. The district development strategy includes a regional industrial park, magnet technology schools that train students across school districts, agreement between the community college and Virginia Tech. to allow transfers into computer engineering, and the building of a regional airport (New River Valley airport), of which Volvo is a primary user. The region is attempting to attract biomedical and biotechnology industry.

Source: Telephone interviews with economic development practitioners.



**TABLE 17.  
EIGHT SUCCESSFUL LDDS PROFILED**

LDD	Mainly Metro.	Key Factor	Near Interstate	Higher Ed.	Explicit Strategy	Economic base	Vulnerability
2D-GA	Yes -Atlanta	Growing suburbs, now also jobs locally	I85	Gwinnett Tech.	Not apparent	Wholesale Trade	
7I-NC	Yes - Winston-Salem	State strategy supports shift to higher skill manufacturing	I40, I77	Yes	Not apparent	Light manufacturing	Tobacco and textiles
10A-SC	Yes-Greenville		Yes	Clemson, CJT for local employers	Yes – foreign mfng	FIRE, Manufacturing (BMW, Michelin)	Textiles
12F-VA	No	Bucolic charm, Shenandoah Valley	Yes	Weak; workforce a priority for future	Strategic planning in 2000, to maintain success	Farming	Workforce Quality, low wages, land use, rural roads
7E-NC	Yes – Hickory	Airport, cheap utilities	Yes	Community colleges	Not apparent locally; state strategy of promoting high-wage manufacturing	Manufacturing – furniture, textiles, fiber optics	Low-wage manufacturing
1H-AL	Yes-Montgomery	Growing suburbs	Yes	Not mentioned	No	Retail	Sprawl, lack of planning and taxing authority
2B-GA	No	Atlanta’s growth; tech. schools; infrastructure, environmental policy	Most of the district	Strong technical schools	Yes – required by state	Manufacturing (seeking high tech.), tourism, retirement destination	Need more \$ for infrastructure
12D – VA	No	Airport, tech. education	CHECK	Magnet technical schools, comm. College, VA. Tech.	Yes – manufacturing and education focused	Manufacturing, including Volvo, seeking high end	Textiles – but mostly gone already

Source: Telephone interviews with economic development practitioners.

## CONCLUSION

This study estimates underemployment and labor force participation rates at the county level within Appalachia. Analyzing this new data, we find that both underemployment and labor force participation capture better than unemployment the continuing need for jobs in parts of Appalachia. While the Appalachian unemployment rate was almost the same as U.S. unemployment in 1998, the Appalachian

underemployment rate was 18 percent higher. The labor force participation rate in Appalachia was 9 percent below the U.S. level in 1998.

Labor force participation rates and underemployment reveal a lack of employment especially in Appalachia's most depressed areas. In Central Appalachia, for example, underemployment equaled 13.6 percent in 1998 compared to the national average of 8.6 percent. This gap somewhat exceeds the divergence between the 7 percent unemployment rate in Central Appalachia and the 4.6 percent unemployment rate in the United States as a whole. The LFPR in Central Appalachia was 53.3 percent in 1998, compared to the national average of 67.7 percent.

Even in Appalachia's Southern region, the LFPR was 65.1 in 1998, lower than the national average. By contrast, unemployment in Southern Appalachia was 3.8 percent, well below the national level. Underemployment in Southern Appalachia was 8.0 percent in 1998, only slightly below the national underemployment rate.

Taking into account all our measures of labor market performance—unemployment, underemployment, average annual wages, employment creation, labor force participation—Appalachia experienced slightly less improvement in the 1993 to 1998 period than the United States as a whole (the underemployment change is from 1994 to 1998 because there is no U.S. figure estimated for 1993).

Even in the prosperous 1990s, the economic gap between Appalachia and the rest of the country did not close. This is largely because of the lagging performance of Appalachia's poorest regions. For example, labor force indicators improved the least in Central Appalachia. The 117 Appalachian counties that were distressed in 1993 experienced less improvement by 1998 in unemployment, underemployment, LFPR, and average annual wage than transitional, competitive, or attainment counties. Over this period, Appalachia's 293 non-metropolitan counties also experienced substantially smaller drops in unemployment and underemployment than the 109 metropolitan counties. The relatively poor performance of economically distressed and non-metropolitan Appalachia during a period of strong economic growth leaves these regions in a relatively weak position should the national economy falter.

Another cause for some concern is the future of manufacturing. Since the 1950s, manufacturing has been an especially important route to economic advancement for Southern Appalachia. Reflecting this, 20 percent of total Southern Appalachian employment is in manufacturing, compared to only 14 percent for Central and Northern Appalachia.

Possibly as a result of competition from low-wage imports, employment in Southern Appalachia's large manufacturing sector dropped by 10 percent from 1993 to 1998. This compares with only a 5 to 6 percent employment decline in manufacturing within Central and Northern Appalachia and the United States as a whole. In manufacturing-dependent non-metropolitan counties in Appalachia, the manufacturing employment share fell from 30.5 to 28.3 percent between 1993 and 1998, while the manufacturing employment share decline in non manufacturing dependent counties was only from 12.2 to 11.7 percent. Possibly as a consequence, unemployment and underemployment declined by 6 percentage points *less* in manufacturing-dependent non-metropolitan Appalachian counties than in non-manufacturing dependent counties.

Underemployment and unemployment actually *rose* about 10 percent in farming-dependent non-metropolitan Appalachian counties between 1993 and 1998 while they fell by more than a quarter elsewhere. Fortunately there were only six farming-dependent counties. Behind the deteriorating labor market situation in farming-dependent Appalachia lay a nearly 10 percent decline in farming employment *and* a manufacturing employment fall of 15 percent.

In non-metropolitan Appalachia, industrially diversified (i.e., non-specialized) counties experienced the best performance from 1993 to 1998. They had five and six percentage point larger declines in underemployment and unemployment than industrially specialized counties. By 1998, underemployment in non-specialized counties was 11.2 percent rather than the 12.2 percent in specialized counties.

For non-metropolitan counties, one positive development was the experience of counties with small urban areas (20,000 or more), not adjacent to a metropolitan area. These communities experienced declines in unemployment and underemployment very similar to those of metropolitan counties. They actually experienced larger such declines than similar-sized urban areas adjacent to metropolitan areas. This could reflect the inward migration of internet professionals and/or retirees, both groups attracted by a combination of scenic beauty and attractive town centers.

Another positive development for non-metropolitan counties was the very low unemployment (4.5 percent) and rapidly improving unemployment and underemployment in the 19 non-metropolitan counties which are retirement destinations.

In another development of interest, FIRE employment increased by 8.5 percent in Appalachia from 1993 to 1998, compared to 1.8 percent nationally. Employment growth was especially high in rural areas, partly because these began with a low base. We conjecture that FIRE employment may partly reflect an expansion of financial services processing and call centers in Appalachia. Whether this represents a promising development direction, with opportunities for diversification from initial, low-skill operations, is unknown.

Evidence from the 10 local development districts in Appalachia underscores that there is more than one path to economic success in the region. Three top 10 districts had unusually high manufacturing sectors, one had a farming sector five times the Appalachian average, a third had a wholesale employment share three times the U.S. and Appalachian averages.

There is little evidence in this report that sole proprietorship offers a promising development approach. In most of Appalachia, proprietorship rises when underemployment rises. It appears to be “entrepreneurship of necessity,” motivated by the absence of alternative means of economic subsistence (Clones 1998). Exceptions include the six most economically successful counties that fall into ARC’s “attainment” category, which also have high proprietorship rates. In these areas, proprietorship may be “entrepreneurship of opportunity,” motivated by the prospect of higher incomes or greater independence than available working as an employee.

### ***The Need for a Next-Generation Appalachian Development Strategy***

Our interviews with economic development practitioners in successful Appalachian Local Development Districts revealed that these regions practice “second generation” southern economic development strategy. While seeking to recruit, as well as grow, manufacturing employers, these regions tended to aim for higher-wage employers; in development generally (not just in manufacturing) they also recognized the important role of government investment in public goods, including infrastructure, education, and training.

We also found a few hints of a third generation Appalachian development approach, defined by more proactive attempts to strengthen particular elements of the local economic base. One tool that might help develop these hints into a real strategy is regional planning, now used in many places to define and obtain consensus on an overall economic development direction. In distressed areas especially, one challenge is making sure that such planning is not process without content – a collective ducking rather than confronting of widely shared anxieties that there is no alternative to economic distress.

In exploring new directions in Appalachian development strategy, more attention must be given to how the region can shift away from low-wage, low-skill production to higher performance approaches able to withstand competition from low-wage developing countries (Wood and Bischak (2000)).

One approach to assisting with such a shift would be to create and nurture institutions that foster improved organizational practice, increased skill development, and greater technological currency within specific industries (Herzenberg, Alic, and Wial 1998/99; Herzenberg 2000). The potential of such institutions at this point in history stems from the co-existence in virtually all industries of quite distinct, alternative ways of organizing production (Piore 1990; Herzenberg, Alic, and Wial 1998). The “high road” promises much higher levels of performance, while the low road is increasingly a dead end for Appalachia.<sup>7</sup> The potential of sectoral institutions to promote higher performance is at least as great outside manufacturing. For that reason, an emphasis on sectoral institution-building in Appalachia would have economy-wide relevance.

To actually improve performance, sectoral institutions must change managerial thinking. Managers must come to believe that “continuous improvement” and progressive human resource practices, not low wages and autocratic supervision are the best route to profitability. One of the most effective ways of achieving this change in thinking is to bring managers into contact with other managers who have demonstrated and believe in the potential of the high road.<sup>8</sup> If they don’t achieve such a managerial “culture change,” even first class industry-specific training and technology institutions are unlikely to achieve better performance on a broad scale. Business simply won’t take advantage of the support that exists for following the high road. The lack of managerial “ownership” of the need for new directions may explain why the Appalachian textile industry has not taken advantage of the impressive capabilities built by textile trade associations to help raise industry productivity and shift to higher value-added products. A complementary reason may be the ease with which larger companies with Appalachian operations can themselves take advantage of lower-wage countries.

In Appalachia, lack of population and firm density make it harder to bring managers together within industry-specific performance-improvement institutions. On the other hand, technology -- the internet, conference call capability -- can partially compensate for lack of density. Moreover, Wojan (1998) shows that even in the rural south, high-quality, high-skill firms cluster together, indicative of agglomeration economies of some kind, and a foundation for strengthening those economies and promoting the high road.

State and federal policy, along with foundations, have begun to recognize the potential of institutions that support multiple firms in an industry. The Bush Administration recently cooperated with a newly formed National Network of Sector Practitioners (NNSP) in drafting a request for proposals to establish sectoral training institutions. Casual empiricism indicates, however, that few sectoral initiatives exist in non-metropolitan Appalachia (an exception is Appalachia By Design, which supports garment industry home workers in areas of marketing and design, thereby hoping to ensure that these workers do not “sweat” themselves). At a recent NNSP conference on best practice sectoral initiatives in low-wage labor markets, there were no participants from southern Appalachia.

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<sup>7</sup> In manufacturing, the low road is usually low-wage mass production rather than literal “sweatshops.” On the distinction between low-wage mass production and sweating, see Herzenberg 1996.

<sup>8</sup> For a valuable discussion of the need to “reach inside the firm” to change organizational practice, and how difficult this is, particularly in the absence of unions, see Dresser 2000.

An ARC Sectoral Initiative: ARC might bring sectoral initiatives more to the mainstream of development approaches in Appalachia by launching an initiative that allocates seed funding for promising proposals to strengthen sectoral infrastructures. In doing this, ARC could partner with the U.S. Department of Labor so that it can capitalize on what DOL has learned about how to distinguish between sectoral proposals for public funding that have genuine potential to transform regional industries and those that have little prospect of influencing industry practice or becoming self-sustaining.

An Awards Program for Best-practice Appalachian Sectoral Intermediaries. A complementary step might be to establish an ARC awards program that honors industry intermediaries that contribute the most to improving performance. In spirit this program would be similar to the Malcolm Baldrige awards established by the U.S. Department of Commerce. The key difference, however, would be recognizing multi-firm institutions, not individual businesses, as critical to the economic development process. Over time, this could help shift intermediaries, including industry associations and unions, away from self-interested lobbying – a zero or negative sum activity from the perspective of society as a whole – and toward establishing an integral role in efforts to achieve continuous improvement.

An Industry Performance Index Program. Another way ARC might support a strategic effort to promote the high road within Appalachia would be through pilot efforts to establish industry performance indices in key Appalachian industries. Such indices, gathered through representative sample surveys (although using existing data where possible), could include direct measures of performance (productivity, quality) and organizational proxies such as investment in training or the share of firms that have obtained ISO status. As well as enabling individual firms to see where they stand relative to their peers, an indexing program might help focus more attention and energy on how regional industries are performing.

### ***Future Research***

The research most critical to the future of Appalachia must directly assist with the very difficult challenge of promoting development, especially in Appalachia's more rural and distressed regions.

One such category of research would seek to enlarge the repertoire of promising approaches development practitioners and community leaders consider. Carefully selected case studies are most likely to yield guidance useful to practitioners and to provide nourishment to Appalachian networks seeking self-consciously to understand what "third generation" development strategies might look like. A small number of case studies might explore in detail Appalachian regions that have succeeded against the odds. Such case studies would be more comprehensive versions of those in Glasmeier and Fuellhart (1999) on districts that moved out of the distressed category from 1988 to 1995. Case studies of successful counties or LDDs might be paired with unsuccessful areas that looked similar in many respects at an earlier point in time (same or neighboring state, same industrial composition, level of poverty, income etc.).

An effort should also be made to include case studies that would illustrate how to pursue development possibilities that may also have potential in other parts of Appalachia.

- Since small towns (urban population over 20,000) not adjacent to a metropolitan area have done well in the 1990s as a group, studies should be conducted of one or two exemplary such small towns. Have they managed to attract significant numbers of internet professionals and, if so, how? What has been the role of telecommunications infrastructure, "Main St." programs to make downtown areas more attractive, land use planning to preserve downtown centers and natural beauty, higher education institutions, or investment in schools, libraries, health care facilities?

- A similar study might be conducted of one or two economically successful retirement communities, such as portions of LDD 2B in Northern Georgia. This should shed light on the health, elder care, transportation, and other needs of the retiree population, and the implications of these needs for other areas seeking to attract retirees.
- Case studies should be conducted of regions that include substantial non-metropolitan manufacturing and have managed to shift from lower-wage to higher-wage manufacturing. Again, portions of LDD 2B are possibilities, although it might be preferable to find a more geographically isolated and less populated transformation success story.
- Can two “similar” regions be found, for example, in which textile and apparel manufacturing, or auto parts manufacturing, have fared very differently—one region adapting and one not—in the face of North American and global free trade? (Gorden Hansen’s unpublished MIT Dissertation provides an example of this type of research on apparel regions in Mexico.) Research along these lines could develop grounded hypotheses about the factors – including the role of strategic planning, sectoral institutions, and infrastructure – associated with improved performance.
- If one could be found, it might also be of interest to explore a region that began with call centers or financial services processing employment but then diversified into other parts of the finance and insurance industries, expanding higher-wage employment.

An advisory group of respected local development practitioners could help guide a case study project. Their input might help ensure that the most cutting-edge strategies are analyzed.

To inform a sectoral initiative, ARC might also commission a special study of the role of industry intermediaries in promoting higher performance in Appalachia. It might address the question of why textile manufacturers have not capitalized on the support build by industry associations for shifting to higher value-added production.

At the present time, in much of non-metropolitan Appalachia as in many urban areas, a pervasive gloom exists regarding the future. ARC’s research must strive to lift this gloom. It should seek to define how government and public-private cooperation can enable all of Appalachia to share in the prosperity of our new economy. By restoring optimism, ARC can also help build the political will necessary to make prosperity a reality.

APPENDIX TABLES

**TABLE A1.**  
**LABOR FORCE VARIABLES IN APPALACHIA BY STATE, 1993-98**  
(in Appalachian portions of each state and in each state as a whole)

	Unemployment				Underemployment				Labor Force Participation				Wages	
	1998 (percent)		Percent Change, 1993-98		1998 (percent)		Percent Change, 1993-98		1998 (percent)		Percent Change, 1993-98		Percent Change, 1993- 98	
	App.	Entire State	App.	Entire State	App.	Entire State	App.	Entire State	App.	Entire State	App.	Entire State	App.	Entire State
Alabama	3.9	4.4	-44	-43	8.1	8.5	-35	-26	63.7	64.4	3.1	1.9	22	22
Georgia	3.3	4.3	-36	-28	6.5	7.6	-29	-24	72.1	70.7	2.1	4.6	25	25
Kentucky	6.8	4.8	-26	-21	12.8	9.2	-15	-17	52.9	64.1	0.9	2.1	19	22
Maryland	6.4	4.8	-37	-28	12.0	8.4	-21	-13	64.9	69.7	5.0	-2.3	23	22
Mississippi	6.3	5.5	5	-18	12.5	10.4	-3	-20	60.2	62.1	-4.3	-1.3	21	24
New York	5.0	5.7	-29	-27	10.1	10.3	-26	-17	63.5	63.5	2.0	2.5	23	25
North Carolina	3.3	3.5	-30	-29	7.7	6.8	-19	-25	62.9	67.1	-2.6	-1.0	18	24
Ohio	5.9	4.3	-25	-35	11.6	7.8	-19	-26	59.5	67.1	0.5	1.6	20	22
Pennsylvania	5.3	4.7	-33	35	10.8	8.7	-28	-27	59.9	64.5	0.3	0.8	22	22
South Carolina	2.8	4.0	-52	-48	6.2	7.6	-54	-35	67.1	66.6	0.1	-0.9	23	21
Tennessee	4.5	4.3	-27	-27	9.4	8.2	-15	-18	32.3	66.2	0.0	2.8	22	24
Virginia	5.7	3.0	-34	-41	12.9	6.2	-33	-38	57.9	68.4	-3.4	-2.4	19	23
West Virginia	6.8	6.8	-39	-37	13.6	12.0	-27	-27	54.8	55.3	0.0	0.2	17	17

Source: see Technical Appendix.

**TABLE A2.  
EMPLOYMENT SHARES IN THE APPALACHIAN PORTION OF EACH STATE, 1998 (percent)**

STATE	Farm	Agricultural Services	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services	Government	Proprietors
Alabama	2.3	1.0	0.7	6.2	17.8	4.4	4.6	16.8	5.1	25.4	15.7	15.0
Georgia	1.8	0.9	0.2	7.7	20.8	3.4	6.7	18.0	5.6	23.4	10.9	17.7
Kentucky	8.2	0.8	4.1	5.3	13.0	5.2	3.1	18.9	3.1	22.8	15.4	21.8
Maryland	1.7	0.6	0.6	6.5	12.0	4.7	4.5	20.0	5.0	31.3	13.2	15.4
Mississippi	4.8	0.7	0.3	5.4	28.9	4.0	2.8	15.3	3.6	19.8	14.3	16.8
New York	2.8	0.8	0.3	3.7	16.7	3.4	2.9	17.7	5.7	30.2	14.9	19.8
North Carolina	2.6	0.9	0.3	7.0	21.9	3.9	3.0	17.4	5.3	26.0	11.5	18.0
Ohio	4.2	0.8	1.3	5.9	16.4	4.4	3.1	20.0	4.8	24.2	14.2	21.8
Pennsylvania	1.4	0.8	0.7	5.3	14.5	5.3	4.0	18.4	6.6	31.0	12.0	16.9
South Carolina	0.9	0.7	0.1	6.9	22.9	4.4	4.8	18.9	4.9	24.0	11.3	12.4
Tennessee	3.9	0.7	0.3	6.0	18.9	4.3	3.9	17.8	5.9	25.2	12.5	19.4
Virginia	5.8	0.8	2.7	5.5	19.1	3.8	3.1	17.4	3.6	21.2	16.2	18.7
West Virginia	2.6	0.7	3.3	5.8	10.0	5.3	3.8	18.4	4.8	28.0	17.1	16.5



**TABLE A3.**  
**CHANGE IN EMPLOYMENT SHARES IN THE APPALACHIAN PORTION OF EACH STATE, 1993-98 (percent)**

STATE	Farm	Agricultural Services	Mining	Construction	Manu- Facutring	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services	Govern- Ment	Proprietor- ship	Total Employment
Alabama	-12	7	-9	13	-7	-2	5	5	-5	8	-8	-3	7
Georgia	-24	5	-23	10	-10	-1	1	9	11	5	-9	-4	26
Kentucky	-11	3	-21	7	-1	2	0	8	-11	5	-2	-3	8
Maryland	-17	15	-9	9	-11	2	-4	-2	-1	12	-7	-1	10
Mississippi	2	9	36	5	-12	15	-7	10	1	13	-3	3	5
New York	-11	-18	-13	0	-6	5	-2	2	25	2	-3	9	3
North Carolina	-13	42	18	12	-12	-4	2	4	11	8	-3	0	7
Ohio	-14	5	-31	10	-3	-2	2	6	10	1	-5	3	10
Pennsylvania	-6	9	-16	2	-5	-2	-6	2	10	2	-3	7	6
South Carolina	-21	23	17	6	-12	0	16	7	3	3	-5	2	14
Tennessee	-13	3	-11	5	-11	22	-39	6	27	0	-6	4	11
Virginia	-5	11	-27	9	-4	0	4	4	-1	40	-5	3	9
West Virginia	-8	4	-17	3	-7	-4	-3	4	2	5	-3	2	7

Source: see Technical Appendix.

<b>TABLE A4</b>											
<b>LABOR FORCE VARIABLES, 1998</b>						<b>CHANGE IN LABOR FORCE VARIABLES, 1993-98</b>					
<b>Beale Code</b>	<b>Under-employment (percent)</b>	<b>Unemployment (percent)</b>	<b>Labor Force Participation (percent)</b>	<b>Proprietorship (percent)</b>	<b>Average Annual Wages (nominal dollars)</b>	<b>Employment (percent)</b>	<b>Unemployment (percent)</b>	<b>Under-employment (percent)</b>	<b>Labor Force Participation (percent)</b>	<b>Average Annual Wages (nominal dollars)</b>	<b>Proprietorship (percent)</b>
0	8.1	3.9	65.9	15.1	\$32,343	10.3	-37.6	-33.6	2.7	23.2	5.2
1	7.9	3.9	64.4	22.2	\$25,257	20.5	-39.5	-36.1	0.7	23.8	-1.0
2	8.2	3.8	64.0	14.9	\$28,204	8.7	-37.6	-32.3	0.8	21.1	2.6
3	9.8	4.8	61.4	16.0	\$25,446	7.6	-38.9	-34.6	2.3	19.0	1.9
4	10.9	5.5	61.0	16.7	\$25,673	7.6	-29.1	-26.6	0.3	20.7	3.2
5	10.6	5.1	61.2	14.7	\$25,476	8.6	-36.4	-32.9	1.3	20.8	3.1
6	11.5	5.6	59.5	21.4	\$24,092	8.5	-34.0	-30.3	-0.4	21.2	1.2
7	12.5	6.3	56.8	20.0	\$23,114	7.5	-25.5	-23.3	-0.6	20.5	1.8
8	13.2	6.6	57.8	33.3	\$21,453	11.7	-28.1	-24.3	1.0	22.1	-0.3
9	15.5	7.9	52.6	27.8	\$20,975	4.6	-18.5	-17.2	-2.9	20.6	4.3

Source: see Technical Appendix.

**TABLE A5.  
EMPLOYMENT SHARES BY INDUSTRY IN APPALACHIA BY BEALE CODE, 1998 (percent)**

Beale	Farming	Agricultural Services	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services
0	0.4	0.7	0.3	6.3	10.5	5.1	6.3	18.4	8.0	34.3
1	2.4	1.0	0.5	8.9	16.3	4.1	4.5	19.2	5.7	24.4
2	1.5	0.8	0.3	6.0	16.9	4.8	4.6	18.1	6.0	28.0
3	2	0.8	0.6	5.9	15.7	4.3	3.9	19.2	4.8	27.1
4	2.3	0.7	0.6	4.7	22.7	3.8	3.4	18.4	4.3	23.7
5	1.8	0.6	1.4	4.9	17.2	4.1	3.4	17.4	4.5	29.1
6	5.1	1.0	1.4	5.9	21.8	4.3	2.6	17.2	4.4	22.3
7	4.8	0.7	2.6	5.4	20.1	4.5	3.0	18.2	3.8	22.1
8	10.4	1.4	2.1	7.1	17.5	4.4	1.9	14.9	4.6	20.3
9	9.9	0.8	4.1	6.1	17.8	4.3	1.7	14.3	3.8	20.7

Source: see Technical Appendix.

**TABLE A6.**  
**CHANGE IN EMPLOYMENT SHARE BY SECTOR, 1993-98 (percent)**

Beale	OBS	Farming	Agricultural Services	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services	Government
0	1	-11	13	-9	4	-2	-4	0	1	9	0	-6
1	2	-20	-3	-20	9	-7	0	0	6	15	0	-6
2	3	-12	15	-11	8	-10	5	0	4	7	4	-6
3	4	-11	9	-22	6	-7	-5	2	3	3	5	-5
4	5	-12	-2	-19	3	-5	5	8	5	9	1	-4
5	6	-9	-21	-3	-1	-8	4	-7	5	7	2	0
6	7	-11	14	-14	8	-6	-6	2	5	14	3	-3
7	8	-9	-6	-23	9	-6	2	1	7	4	6	-4
8	9	-13	6	-33	7	-5	5	0	9	22	4	-3
9	10	-8	-11	-18	15	-14	9	-8	9	22	7	0

Source: see Technical Appendix.

**TABLE A7.  
Ratio of US Average of Demographic Group to US Average for Entire Relevant Population, 1998**

GROUP	Labor Force Participation	Unemployment Rate	Under-Employment Rate	Farming	Agricultural Services	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services	Government	Proprietorship
Age 16-24	0.98	2.27	2.10	0.97	1.45	0.51	0.87	0.66	0.58	0.73	2.16	0.69	0.87	0.33	0.19
Age 25-44	1.25	0.83	0.84	0.75	1.03	1.09	1.11	1.09	1.07	1.08	0.84	1.06	0.99	1.04	0.88
Age 45-64	1.09	0.59	0.64	1.10	0.71	1.12	0.93	1.07	1.13	1.00	0.68	1.04	1.07	1.30	1.43
Age 65+	0.18	0.66	0.81	4.23	0.74	0.79	0.61	0.57	0.67	1.08	1.01	1.18	1.17	0.76	2.75
Graduate School	1.21	0.34	0.36	0.23	0.67	0.63	0.18	0.58	0.43	0.50	0.20	0.89	1.90	1.37	1.53
College	1.18	0.45	0.46	0.52	0.54	1.02	0.47	0.87	0.91	1.14	0.56	1.63	1.24	1.39	1.12
Some College	1.10	0.77	0.79	0.64	0.78	0.79	0.90	0.87	1.19	1.03	1.03	1.14	0.98	1.27	0.93
High School	0.99	1.07	1.09	1.11	0.99	1.24	1.39	1.24	1.19	1.11	1.15	0.83	0.75	0.77	0.96
Less than HS	0.69	2.35	2.21	2.63	2.30	1.09	1.55	1.14	0.66	0.83	1.68	0.33	0.71	0.20	0.75
Black	0.98	1.98	1.79	0.21	0.57	0.42	0.57	0.96	1.37	0.67	0.91	0.94	1.11	1.50	0.41
Hispanic	1.01	1.56	1.56	2.03	2.19	0.89	1.26	1.11	0.94	1.07	1.14	0.70	0.86	0.65	0.57
Other	1.00	1.04	1.05	0.45	0.57	0.42	0.52	1.11	0.92	0.89	1.18	0.92	1.05	0.88	1.02
White	1.00	0.77	0.79	1.01	0.93	1.13	1.05	0.98	0.96	1.04	0.98	1.05	1.00	0.98	1.14
Female	0.89	1.02	1.07	0.50	0.55	0.30	0.20	0.69	0.63	0.65	1.10	1.27	1.34	0.94	0.73
Male	1.12	0.98	0.94	1.43	1.39	1.61	1.69	1.27	1.32	1.30	0.91	0.77	0.70	1.05	1.23

Source: Keystone Research Center based on the Current Population Survey.

**TABLE A8.  
TEN LOCAL DEVELOPMENT DISTRICTS WITH THE HIGHEST UNDEREMPLOYMENT RATES IN 1998**

LDD	ST.	COUNTIES	LABOR FORCE VARIABLES IN 1998 (percent)				PERCENT CHANGE, 93-98					
			Under-employment Rate	Unemployment Rate	Labor Force Participation Rate	Proprietorship	Under-employment Rate	Unemployment Rate	Labor Force Participation Rate	Proprietorship	Employment	Nominal Wage
12B	VA	Buchanan, Dickenson, Russell, Tazewell	20.1	10.6	52	19	-17	-19	-1.8	5.1	4.4	16
3F	KY	Adair, Casey, Clinton, Cumberland, Green, McCreary, Pulaski, Russell, Wayne	19.0	10.5	56	28	32	34	2-2.8	-2.3	2.7	24
12A	VA	Lee, Scott, Wise	17.6	8.9	51	22	-16	-19	-4.1	3.9	4.4	18
5D	MS	Kemper	17.4	9.5	54	27	16	18	-0.9	4.9	6.2	27
13G	WV	Barbour, Braxton, Gilmer, Lewis, Randolph, Tucker, Upshur	17.4	9.1	53	23	-28	-31	-0.1	3.2	7.3	16
13D	WV	Fayette, Greenbrier, Nicholas, Pocahontas, Webster	16.5	8.8	48	19	-38	-41	-3.4	4.5	4.4	16
13E	WV	Calhoun, Jackson, Pleasants, Ritchie, Roane, Tyler, Wirt, Wood	16.2	7.9	58	19	-26	-31	-0.9	-0.9	6.0	19
13B	WV	Cabell, Lincoln, Logan, Mason, Mingo, Wayne	16.1	8.1	48	14	-26	-31	-3.9	2.8	2.0	16
3A	KY	Fleming, Lewis	15.4	8.7	52	42	-19	-20	-15.0	3.6	-1.5	28
3B	KY	Boyd, Carter, Elliott, Greenup, Lawrence	14.7	8.0	55	18	-33	-35	-0.1	-1.1	5.5	14
		ALL APPALACHIA	10.0	4.8	62	18	-21	-34	0.8	2.4	8.8	21.3
		ENTIRE UNITED STATES	8.6	4.6	68	17	-26	-34	1.3	2.4	12.1	22.6

Source: see Technical Appendix.

**TABLE A9.  
TEN LOCAL DEVELOPMENT DISTRICTS WITH THE HIGHEST UNDEREMPLOYMENT RATES IN 1998**

		Employment Shares by Industry by LDD in 1998 (percent)											
	COUNTIES	Farming	Agricultural Services	Mining	Con-struction	Manu-facturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services	Government	
12B	VA	Buchanan, Dickenson, Russell, Tazewell	4.8	0.5	9.7	5.1	10.3	5.8	3.5	18.8	3.5	22.1	15.8
3F	KY	Adair, Casey, Clinton, Cumberland, Green, McCreary, Pulaski, Russell, Wayne	14.6	0.9	0.4	5.0	18.1	4.4	3.1	16.1	3.0	21.0	13.2
12A	VA	Lee, Scott, Wise	9.6	0.8	8.0	5.6	7.6	5.8	2.8	18.4	3.2	22.3	15.8
5D	MS	Kemper	15.3	2.5	0.0	3.5	29.9	3.2	0.9	10.0	2.8	15.4	16.5
13G	WV	Barbour, Braxton, Gilmer, Lewis, Randolph, Tucker, Upshur	5.5	0.7	4.3	5.7	10.8	4.1	2.6	18.1	3.6	28.1	16.6
13D	WV	Fayette, Greenbrier, Nicholas, Pocahontas, Webster	4.1	0.5	3.7	5.6	8.6	5.3	2.6	19.0	3.5	29.1	18.1
13E	WV	Calhoun, Jackson, Pleasants, Ritchie, Roane, Tyler, Wirt, Wood	3.6	0.5	2.7	7.0	17.2	4.1	3.5	18.5	4.6	24.2	13.6
13B	WV	Cabell, Lincoln, Logan, Mason, Mingo, Wayne	1.7	0.6	4.9	5.4	8.8	6.7	4.4	19.0	4.1	28.8	15.6
3A	KY	Fleming, Lewis	25.1	0.9	0.1	5.4	14.7	4.4	1.9	12.9	3.1	15.6	14.7
3B	KY	Boyd, Carter, Elliott, Greenup, Lawrence	5.4	0.5	2.1	6.7	13.9	7.0	3.2	20.3	3.4	25.1	12.6
		ALL APPALACHIA	1.9	0.8	0.9	5.9	17.3	4.5	4.1	18.0	5.4	26.7	13.3
		ENTIRE UNITED STATES	2.7	1.3	0.5	5.3	12.4	4.8	4.6	16.9	7.5	30.8	13.9

Source: see Technical Appendix.

**TABLE A10.  
TEN LOCAL DEVELOPMENT DISTRICTS WITH THE HIGHEST UNDEREMPLOYMENT RATES IN 1998**

		Change in Industry Employment Shares, 93-98 (percent)											
		COUNTIES	Farming	Agricultural Services	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services	Government
12B	VA	Buchanan, Dickenson, Russell, Tazewell	-1	-1	-29	6	13	6	12	9	-8	4	-2
3F	KY	Adair, Casey, Clinton, Cumberland, Green, McCreary, Pulaski, Russell, Wayne	-10	20	-7	16	-16	16	9	11	-3	11	2
12A	VA	Lee, Scott, Wise	-3	26	-20	33	-19	11	9	4	-6	10	-5
5D	MS	Kemper	1	105	NA	9	-7	9	46	4	16	9	-10
13G	WV	Barbour, Braxton, Gilmer, Lewis, Randolph, Tucker, Upshur	-9	2	-28	11	3	-5	-4	10	1	7	-4
13D	WV	Fayette, Greenbrier, Nicholas, Pocahontas, Webster	-7	-9	-32	1	-14	4	11	6	-2	6	3
13E	WV	Calhoun, Jackson, Pleasants, Ritchie, Roane, Tyler, Wirt, Wood	-8	9	-29	24	-4	5	-1	6	11	6	-13
13B	WV	Cabell, Lincoln, Logan, Mason, Mingo, Wayne	-6	-2	-17	4	-6	-11	-4	6	-1	7	-3
3A	KY	Fleming, Lewis	-3	-10	-88	9	-22	17	3	8	-5	17	4
3B	KY	Boyd, Carter, Elliott, Greenup, Lawrence	-9	-30	-25	-3	-12	-3	16	9	-9	7	1
		ALL APPALACHIA	-10.8	7.8	-18.6	7.1	-7.4	0.7	0.6	4.3	8.5	3.3	-4.8
		ENTIRE UNITED STATES	-11.2	9.8	-19.0	8.3	-6.0	2.0	-0.8	2.0	1.8	4.5	-8.1

Source: see Technical Appendix.



**TABLE A11.  
TEN LOCAL DEVELOPMENT DISTRICTS WITH THE LOWEST UNDEREMPLOYMENT RATES IN 1998**

LDD	ST.	COUNTIES	LABOR FORCE VARIABLES IN 1998 (percent)				PERCENT CHANGE, 93-98					
			Under-employment Rate	Unemployment Rate	Labor Force Participation Rate	Proprietorship	Under-employment Rate	Unemployment Rate	Labor Force Participation Rate	Proprietorship	Employment	Nominal Wage
2D	GA	Cherokee, Douglas, Gwinnett	4.3	2.6	79	17	-40	-39	2	-9	36	27
1H	AL	Elmore	5.6	2.9	60	25	-50	-55	2	-4	13	23
10A	SC	Oconee, Anderson, Cherokee, Greenville	6.2	2.8	67	12	-46	-52	0	2	13	23
1E	AL	Chilton, Walker, Blount, Jefferson, St. Clair, Shelby	6.3	3.0	65	13	-46	-50	5	-4	10	24
7B	NC	Henderson, Transylvania, Buncombe, Madison	6.5	2.6	61	18	-30	-38	-2	0	9	22
2B	GA	Banks, Dawson, Forsyth, Franklin, Habersham, Hall, Hart, Lumpkin, Rabun, Stephens, Towns, Union, White	6.6	3.1	70	20	-33	-38	3	-3	28	25
7I	NC	Surry, Davie, Forsyth, Stokes, Yadkin	6.7	2.7	66	16	-23	-31	-1	-2	8	21
3C	KY	Clark, Estill, Garrard, Lincoln, Madison, Powell				23	-33	-40	3	-8	14	20
7E	NC	Alexander, Burke, Caldwell	7.1	2.8	66	16	-23	-30	-6	4	0	20
13I	WV	Berkeley, Jefferson, Morgan	7.2	3.6	62	20	-47	-52	-1	0	15	21
		ALL APPALACHIA	10.0	4.8	62	18	-21	-34	0.8	2.4	8.8	21.3
		ENTIRE UNITED STATES	8.6	4.6	68	17	-26	-34	1.3	2.4	12.1	22.6

**TABLE A12.  
TEN LOCAL DEVELOPMENT DISTRICTS WITH THE LOWEST UNDEREMPLOYMENT RATES IN 1998**

		Employment Shares by Industry by LDD in 1998 (percent)											
		COUNTIES	Farming	Agricultural Services	Mining	Construction	Manu- facturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Services	Govern- ment
2D	GA	Cherokee, Douglas, Gwinnett	0.3	0.9	0.1	8.9	11.1	3.1	11.2	20.2	7.2	27.8	8.5
1H	AL	Elmore	4.3	2.0	0.2	9.2	14.1	3.5	2.1	19.0	3.9	21.8	20.0
10A	SC	Oconee, Anderson, Cherokee, Greenville	0.9	0.7	0.1	6.9	22.9	4.4	4.8	18.9	4.9	24.0	11.3
1E	AL	Chilton, Walker, Blount, Jefferson, St. Clair, Shelby	0.8	1.1	0.9	6.7	9.9	6.1	6.5	16.7	7.5	30.5	13.4
7B	NC	Henderson, Transylvania, Buncombe, Madison	2.4	0.9	0.1	7.3	17.1	3.8	3.7	18.7	5.3	28.8	11.8
2B	GA	Banks, Dawson, Forsyth, Franklin, Habersham, Hall, Hart, Lumpkin, Rabun, Stephens, Towns, Union, White	3.4	1.2	0.2	8.3	21.3	3.3	4.2	16.8	5.6	23.7	11.5
7I	NC	Surry, Davie, Forsyth, Stokes, Yadkin	2.1	0.9	0.2	6.8	19.6	5.3	3.6	16.6	6.7	29.4	8.8
3C	KY	Clark, Estill, Garrard, Lincoln, Madison, Powell	10.2	1.4	0.3	5.9	18.5	3.7	2.4	18.4	3.1	20.5	15.8
7E	NC	Alexander, Burke, Caldwell	1.7	0.3	0.1	4.9	39.1	2.9	1.7	13.7	2.7	18.7	13.6
13I	WV	Berkeley, Jefferson, Morgan	3.0	1.1	0.5	6.6	11.6	2.8	3.1	19.6	5.5	24.2	18.8
		ALL APPALACHIA	1.9	0.8	0.9	5.9	17.3	4.5	4.1	18.0	5.4	26.7	13.3
		ENTIRE UNITED STATES	2.7	1.3	0.5	5.3	12.4	4.8	4.6	16.9	7.5	30.8	13.9

**TABLE A13.  
TEN LOCAL DEVELOPMENT DISTRICTS WITH THE LOWEST UNDEREMPLOYMENT RATES IN 1998**

		Change in Industry Employment Shares, 93-98 (percent)											
		COUNTIES	Farming	Agricultural Services	Mining	Con-struction	Manu-facturing	Transportation & Public Utilities	Wholesale Trade	Retail Trade	FIRE	Serv-ices	Government
2D	GA	Cherokee, Douglas, Gwinnett	-30	14	-15	7	-2	-3	-6	5	7	1	-13
1H	AL	Elmore	-15	-10	-28	16	3	7	5	2	22	1	-10
10A	SC	Oconee, Anderson, Cherokee, Greenville	-21	23	17	6	-12	0	16	7	3	3	-5
1E	AL	Chilton, Walker, Blount, Jefferson, St. Clair, Shelby	-13	8	-14	15	-9	-6	4	2	-5	6	-8
7B	NC	Henderson, Transylvania, Buncombe, Madison	-14	32	-27	7	-9	-9	8	3	15	4	-5
2B	GA	Banks, Dawson, Forsyth, Franklin, Habersham, Hall, Hart, Lumpkin, Rabun, Stephens, Towns, Union, White	-25	3	-27	12	-11	-2	9	6	11	9	-9
7I	NC	Surry, Davie, Forsyth, Stokes, Yadkin	-13	125	1	12	-12	-4	-3	2	10	6	-4
3C	KY	Clark, Estill, Garrard, Lincoln, Madison, Powell	-14	0	16	15	13	3	-11	6	-18	-1	-7
7E	NC	Alexander, Burke, Caldwell	-7	25	-35	13	-10	7	-3	5	-9	15	6
13I	WV	Berkeley, Jefferson, Morgan	-10	6	-11	0	-1	-5	-20	9	2	-8	-3
		ALL APPALACHIA	-10.8	7.8	-18.6	7.1	-7.4	0.7	0.6	4.3	8.5	3.3	-4.8
		ENTIRE UNITED STATES	-11.2	9.8	-19.0	8.3	-6.0	2.0	-0.8	2.0	1.8	4.5	-8.1

## TECHNICAL APPENDIX

The statistics on which this report is based are the industrial composition of employment, average annual wage, unemployment rate, labor force participation rate, underemployment rate, and proprietorship rate. We derived each of these statistics for each of the 406 Appalachian counties for each of the years 1993-1998. We grouped the counties in several different ways to produce the aggregate-level statistics that appear in the body of the report. For comparative purposes, we also calculated each statistic for each Appalachian state as a whole, for the United States as a whole, and for various demographic groups in the United States as a whole. This appendix explains how we calculated each statistic at the county, state, national, and demographic group levels, and explains how we grouped the Appalachian counties.

### *Industrial composition of employment at the county level*

Our primary data source was the Bureau of Economic Analysis' Regional Economic Information Service (REIS) data. At the time we performed our analyses, these data were available annually through the year 1997. This data source, derived from the Department of Labor's ES-202 surveys, is readily available at no cost and has fewer instances of data suppression than the leading alternative, *County Business Patterns*. Unlike *County Business Patterns*, REIS also covers all industries.<sup>9</sup>

For each county in each of the years 1993-1997, we estimated the employment share that was accounted for by each SIC one-digit industry (agricultural services; mining; construction; manufacturing; transportation and public utilities; wholesale trade; retail trade; finance, insurance, and real estate; services; and government) and the employment share that was accounted for by crop and livestock production (also referred to as "farming"). (REIS treats agricultural services and farming as separate industries. REIS total employment is the sum of farming employment and the employment in all the one-digit industries.<sup>10</sup>) The employment share for each industry is the employment level for that industry divided by total employment. Because no REIS employment data were available for 1998, we set each industry's 1998 employment share equal to the corresponding 1997 industry employment share.

Even at the one-digit level of aggregation, some REIS industry-level employment data in are suppressed for certain counties. Sometimes the suppression takes the form of employment data being reported as "fewer than ten employees." Where this was the case, we will use the midpoint of the reported range (i.e., five employees) as a point estimate of employment in an industry.

Sometimes, however, REIS suppresses industry-level employment data entirely. In the latter cases, we turned to *County Business Patterns*, which usually reports employment ranges in industries for which point estimates are suppressed. We used the midpoint of each range as the point estimate of employment in each industry/county cell for which a range is reported. To reconcile employment estimates derived from *County Business Patterns* with those derived from

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<sup>9</sup> The main disadvantage of the REIS relative to *County Business Patterns* is that some firms report all their ES-202 (and hence, REIS) employment as if it were concentrated at a single location when it may actually be scattered throughout a state. The severity of this problem is reduced when county-level data are aggregated, as they are in this report.

<sup>10</sup> REIS employment levels, which are derived from a survey of business establishments, are not comparable to Current Population Survey, Census, or *Local Area Unemployment Statistics* employment levels, which are derived from household surveys.

REIS, we used the following formula to estimate the industry employment share of any industry  $j$  for which *County Business Patterns* was used:

$$E_{j,t}/[\sum_i ER_{i,t}] = [EC_{j,t}]/[\sum_i EC_{i,t}], \quad (1)$$

where  $E_{j,t}$  is estimated employment in industry  $j$  in year  $t$ ,  $EC_{j,t}$  is the estimate of employment in industry  $j$  in year  $t$  derived from *County Business Patterns*,  $ER_{i,t}$  is the estimate of employment in industry  $i$  in year  $t$  derived from REIS, and  $i$  indexes all industries for which we derived estimates from *County Business Patterns*. In those few county-industry cells for which neither REIS nor *County Business Patterns* provided any employment data, we were able to estimate the industry employment level by subtracting the sum of all other industry employment levels from REIS total employment.

### ***Average annual wage data at the county level***

The REIS data available to us included the wage and salary earnings per job (referred to in this report as the “average annual wage”) for each county in each of the years 1993-1997. This measure is less than ideal because it captures the combined effects of hourly wages and hours worked. However, it is the only wage measure available at the county level. Because no REIS data for 1998 were available at the time we performed our analyses, we estimated each county’s 1998 average annual wage as that county’s 1997 average annual wage multiplied by the ratio of 1998 national average weekly earnings to 1997 national average weekly earnings. We obtained 1997 and 1998 national average weekly earnings from the combined outgoing rotation groups of the Bureau of Labor Statistics’ Current Population Surveys (CPS) for each of the years 1997 and 1998. (We used this procedure to estimate 1998 Appalachian county average annual wages because we expected the 1998-1997 ratio of national average weekly earnings to be a close approximation to the 1998-1997 ratio of REIS average annual wages, and because additional geographic disaggregation of wages at the Appalachian county or regional level was not possible at the time we performed our analyses.) All of our wage variables are expressed in nominal (i.e., not inflation-adjusted) terms.

### ***Unemployment rates at the county level***

The Bureau of Labor Statistics’ *Local Area Unemployment Statistics* contains information on the numbers of employed and unemployed persons in each county in each year. (The *Local Area Unemployment Statistics* data available at the time we performed our analyses were final for 1993 and 1994. The data for 1995-1998 were preliminary and were subject to subsequent revision.<sup>11</sup>) We used these data to calculate county unemployment rates for each year. The unemployment rate equals the 100 times the number of unemployed persons divided by the sum of the number of employed persons and the number of unemployed persons.

### ***Labor force participation rates at the county level***

We used the *Local Area Unemployment Statistics* to estimate the size of the labor force and Census Bureau population estimates to estimate the age-16-and-up population of each county in each year. We estimated the labor force participation rate as 100 times the ratio of labor force (i.e., employed persons plus unemployed persons) to age-16-and-up population. Bureau of Labor Statistics personnel informed us that the *Local Area Unemployment Statistics* data may validly be combined with Census population estimates to determine the labor force participation rate.

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<sup>11</sup> Data for 1995 were benchmarked to 1997. Data for 1996-1998 were benchmarked to 1998.

In principle, the denominator of the labor force participation rate should be the population eligible to work for pay. Our exclusion of the under-16 population from the denominator is justified because federal law prohibits most forms of paid employment for children under age 16. Some analysts would also exclude the age-65-and-up population from the denominator because most people in this age group are retired. However, we included persons aged 65 and up in the denominator because many of them are able to choose whether or not to work.

### *Underemployment rates at the county level*

Since data on involuntary part-time and marginally attached workers are not collected at the county level, underemployment could not be calculated directly. Our underemployment rate estimates for each county in each of the years 1993-1998 were obtained from the following regression, which we estimated on state-level aggregate cross-section data. The regression is based on the assumption that unemployment is a disequilibrium phenomenon that can be explained by wage levels and by labor supply (demographic) and labor demand (industrial composition of employment) variables. We obtained state-level underemployment rates from the combined monthly CPS, demographic variables from the Census annual population estimates and wage and industrial composition of employment variables from the REIS. All state-level variables were for the year 1997.

**Dependent variable: underemployment rate (expressed as percent)**

<b>Independent Variable</b>	<b>Estimated Coefficient</b>	<b>Standard Error</b>
Intercept	-13.387919	9.59341761
Unemployment rate (expressed as percent)***	1.664494	0.09004448
Share of population aged 16-24	-4.441921	5.98110854
Share of population aged 25-44	-1.987809	4.03104200
Share of population aged 45-64*	12.302203	6.50407824
Share of population female	18.317521	13.4594168
Share of population white	-0.990744	0.82404438
Share of population black	-1.897238	1.37132679
Share of population Hispanic (Census-defined)	1.280433	1.04654477
Share of age-18-and-up population with education between 9 <sup>th</sup> and 12 <sup>th</sup> grade, no high school diploma	-4.613012	7.38282707
Share of age-18-and-up population with high school diploma only	3.695210	3.59665450
Share of age-18-and-up population with some college education, no degree*	6.493445	3.83927176
Share of age-18-and-up population with associate degree	4.172016	9.17026634
Share of age-18-and-up population with bachelor's degree	7.867778	6.04443563
Share of age-18-and-up population with graduate degree	-7.897507	6.98089214
Share of employment in agricultural services	10.804319	18.36443677
Share of employment in mining	15.267202	10.49084481
Share of employment in construction	4.881186	11.15255693
Share of employment in manufacturing	7.557026	7.26697743
Share of employment in transportation & public utilities	5.994502	13.00082875
Share of employment in wholesale trade	-10.760589	15.54919989
Share of employment in retail trade	-4.528346	7.90359777
Share of employment in finance, insurance & real estate	4.971056	10.56678252
Share of employment in services	6.018971	6.32082619
Share of employment in government	5.171742	8.32755215
Average annual (1997 nominal) wage	-0.000057846	0.00004339

$R^2=0.9894$ , adjusted  $R^2=0.9784$

\*coefficient significant at 10 percent level, \*\* \*coefficient significant at 1 percent level

To obtain estimated county-level underemployment rates, we applied the coefficients from this regression to county-level values of the regressors (including county-level industry employment shares estimated as described above). We obtained county-level values of the unemployment rate from the *Local Area Unemployment Statistics*, as described above. Our county-level values of the age, race-ethnicity, and education variables came from the U.S. Census annual county-level population estimates. Our county-level values of the industry employment shares and average annual wage came from the REIS.

We arrived at the above specification after extensive experimentation with alternative sets of explanatory variables and functional forms. To test each specification, we compared the predicted county-level underemployment rates with underemployment rates obtained directly from combined monthly CPS data for large Appalachian counties that could be separately

identified in the CPS. We determined that the above specification, estimated on 1997 state-level data, came closest to approximating the county-level CPS underemployment rates for all the years 1994-1998. (It is not possible to obtain underemployment rates from the CPS for 1993, so we could not test our specification on 1993 data.) Therefore, we applied the coefficients from the above specification of the state-level regression to our county-level data for all 406 Appalachian counties for each of the years 1993-1997 to obtain estimated county-level underemployment rates.

Our estimation method is based on two assumptions. The first is that the determinants of underemployment in Appalachian counties are the same as those elsewhere in the United States (or at least elsewhere in Appalachian states), so that those relationships can validly be estimated from state-level data. The second is that underemployment is the result of a labor market disequilibrium, so that a reduced-form equation for predicting underemployment appropriately includes determinants of both labor supply and labor demand. The first assumption is unavoidable given the limitations of available data. The second assumption is often used in the economic literature on unemployment. Because we consider underemployment to reflect the same economic phenomenon as officially measured unemployment, the second assumption is appropriate for analyzing underemployment to the extent that it is appropriate for analyzing unemployment.

### ***Proprietorship at the county level***

REIS contains county-level data on proprietorship employment, which is defined to include both sole proprietors and partners. For each of the years 1993-1997, we calculated each county's proprietorship rate as the ratio of proprietorship employment to REIS total employment in that county. Because 1998 REIS data were unavailable at the time we performed our analyses, we set each county's 1998 proprietorship rate equal to that county's 1997 proprietorship rate.

### ***Grouping of counties***

We grouped the county-level estimates for presentation in the text of the report. We presented the data using several different methods of aggregation, each of which may be useful to a different kind of public official or practitioner. State-level public officials and others who are concerned with state-level public policy may be interested in comparing their state's portion of Appalachia with other states' portions of Appalachia. Therefore, we presented data for each state's portion of Appalachia. Because ARC and other parties may be interested in analyzing trends within the 71 Local Development Districts in Appalachia, we also presented data for each of these districts. County and state officials who are concerned with ARC assistance may be interested in grouping counties using ARC's distressed/near distressed/competitive/attainment classification; we used this classification as well. Because metropolitan and non-metropolitan areas are likely to face substantially different economic development challenges, we grouped counties into metropolitan and non-metropolitan categories. Within the non-metropolitan category, a county's proximity to a metropolitan area and the size of the county's largest locality are also likely to affect the county's economic development prospects. Within the metropolitan category, the size of the county's metropolitan area and the location of the county within the metropolitan area (central or peripheral) could affect economic development prospects. The nine-category Beale Code classification, developed by the U.S. Department of Agriculture's Economic Research Service and most recently available for the year 1993, enabled us to group all counties (metropolitan and non-metropolitan) according to these criteria as of 1993. Finally, the Economic Research Service also produced a classification of all non-metropolitan counties



according to measures of their economic base in the late 1980s or early 1990s. (The economic base may correspond to a dominant industry or to another important aspect of economic activity, such as being a retirement destination. The year to which the economic base data pertain varied with the particular economic base measure; details may be found in the codebook for our county-level data set.) We grouped counties according to these economic base categories. (For definitions of the Beale Codes and economic base categories, see the codebook for our county-level data set.)

Regardless of which aggregation method was used, the mechanics of aggregating county-level data into county-group data were the same. Once an appropriate county group was specified, the county-group value of each variable estimated in our report was a weighted average of the individual county values of that variable. The weight for each county was the ratio of that county's value of a weighting variable to the group aggregate value of the weighting variable. For industry employment shares and proprietorship rates, the weighting variable is REIS total employment. For unemployment rates, the weighting variable is the labor force, which we obtained from the *Local Area Unemployment Statistics*. For labor force participation rates, the weighting variable was population, which we obtained from Census annual population estimates.

For underemployment rates, the appropriate weighting variable is the augmented labor force, which cannot be obtained directly except for the few Appalachian counties that are identifiable in the CPS. We considered several alternative methods of estimating underemployment rates for county groups and compared predicted county-group underemployment rates from these methods with underemployment rates obtained directly from combined monthly CPS data for several groups of large Appalachian counties that could be separately identified in the CPS. (We used as comparison groups all the counties in Pennsylvania and Alabama, respectively, that could be identified in the CPS, as well as arbitrary groupings of CPS-identifiable Appalachian counties from multiple states.) We determined that population aged 16 and up was the weighting variable that best approximated the CPS underemployment rates for our comparison groups. Therefore, we used population aged 16 and up as the weighting variable to aggregate county underemployment rates to the county-group level.

### ***Geographic comparisons***

The labor market indicators derived for individual counties and county groups can readily be compared with national indicators and state-level indicators for Appalachian states. We obtained national and state-level industry employment shares, average annual wages, and proprietorship rates from REIS using the same methods described above for individual counties. We used the combined monthly CPS to obtain national and state-level unemployment and labor force participation rates that are comparable with those derived for the individual counties. (Bureau of Labor Statistics personnel informed us that unemployment and labor force participation rates derived from the CPS are comparable to those derived from *Local Area Unemployment Statistics* and Census data.)

We calculated national underemployment rates from the combined monthly CPS for each of the years 1994-1998. (Prior to 1994, the CPS did not include all the variables needed to calculate the number of "marginally attached" workers, so we were unable to calculate underemployment rates for 1993.) We calculated state-level underemployment rates for Appalachian states from the combined monthly CPS for each of the years 1994-1998 and used the estimated coefficients from our cross-state regression [described above] to impute 1993 state-level underemployment rates for those states.) Because we estimated county-level underemployment rates using coefficients

obtained from regressions using CPS data, it is appropriate to compare our county-level estimated underemployment rates with national and state underemployment rates derived from the CPS.

### *Demographic comparisons*

The report includes annual 1993-1998 national-level comparisons of each labor market indicator by age, race, sex, and educational level. We did not make these comparisons at the county- or county-group level because no data are available that would enable reasonable estimates to be made at those levels. We did not make the comparisons at the state level because our estimates of the labor market indicators showed that those indicators are quite different for the Appalachian portion of each state than for the state as a whole. Moreover, we determined that there was no way to disaggregate the CPS (the only source of data at the demographic-group level for 1993-1998 for geographic areas smaller than states) to approximate the Appalachian region in all Appalachian states. We could have used 1990 Census data to produce demographic comparisons of labor market indicators for sub-state regions within Appalachia and for Appalachia as a whole, but those comparisons would not necessarily have been valid for the years 1993-1998. For all these reasons, we confined our demographic comparisons of labor market indicators to the national level.

We used the four standard Census age categories that cover the working-age population (i.e., ages 16-24, 25-44, 45-64, and 65-and-up), four racial/ethnic categories (Hispanic, white non-Hispanic, black non-Hispanic, and other non-Hispanic), five educational categories (less than high school, high school graduate, some college, college graduate, postgraduate schooling), and two sex categories (male and female). We calculated the ratio of the value of each labor market indicator for each (national) demographic group to the value of the same indicator for the entire U.S. population in each year. From these ratios, it is possible to determine the percentage difference between the value of a labor market indicator for a particular demographic group and the value of that indicator for the nation as a whole.

We based our comparisons on data from the combined monthly CPS for each of the years 1993-1998. This is the only data source that permits the calculation of demographic group-specific values of labor market indicators for those years. Unemployment, underemployment, and labor force participation rates obtained from this source are directly comparable to those we derived at the county level using the methods described above.<sup>12</sup> There are some minor differences between the industry definitions used in the CPS and those used in the REIS, but these differences are unlikely to have much effect on the ratios described here. The CPS contain data on self-employment rather than on proprietorship as defined in the REIS (which includes both sole proprietorships and partnerships). Once again, this difference is unlikely to have much effect on the ratios described here. We did not perform demographic comparisons for wages because CPS wage measures differ so greatly from those in the REIS that even ratio comparisons of the type described here may not approximate the ratios that would be obtained if wages were defined as in the REIS.

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<sup>12</sup> As explained above, it is not possible to calculate national underemployment rates for 1993, so demographic comparisons of underemployment rates are included in the report for the years 1994-1998 only.

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