

***Demographic and Socioeconomic Change
in Appalachia***

**EMERGING PATTERNS OF POPULATION
REDISTRIBUTION AND MIGRATION IN APPALACHIA**

by

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EMERGING PATTERNS OF POPULATION REDISTRIBUTION AND MIGRATION IN APPALACHIA

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Introduction

The social and economic history of Appalachia is characterized by illiteracy and joblessness, persistent poverty, and cultural isolation (Pollard 2003).¹ As the birthplace of President Lyndon Johnson's "War on Poverty" in 1964, the Appalachian region's fortunes historically have been tied to its declining extractive industries—agriculture, mining, and timber. Perhaps less well appreciated is that the economic conditions in Appalachia overall have improved significantly over the past several decades. The region's industrial base has become more diversified. Its physical infrastructure (i.e., highways, telecommunications, and other public utilities) has been transformed. Indeed, poverty and illiteracy among Appalachia's people have declined significantly since President Johnson set foot in Martin County, Ky., in April 24, 1964, when he rededicated the nation's efforts to fight persistent poverty and social injustice. The president's words ultimately found expression in his "Great Society" and the passage of the Economic Opportunity Act of 1964.

Appalachia has also become a region marked by substantial and perhaps growing economic and cultural diversity. The past three decades or so have told alternately hopeful and pessimistic stories of economic winners (mostly urban) and chronic losers (mostly rural communities). Any optimism gained from Appalachia's overall improving

¹ The Appalachian region, which remains disproportionately rural compared to the rest of the United States, covers more than 200,000 square miles, extends from New York State to Mississippi, and is comprised of 410 counties covering 13 states along the Appalachian mountain range (Appalachian Regional Commission 2004a).

economic conditions must therefore be tempered by apparently growing geographic disparities within Appalachia and across the nation in terms of poverty, employment, and out-migration (McLaughlin et al. 2001; Lichter and McLaughlin 1995). Patterns of in- and out-migration have played an unusually large and significant role historically in perpetuating poverty and spatial inequality in Appalachia. For many decades, Appalachia's "best and brightest" have fled rural and poverty-stricken areas for the region's burgeoning metropolitan employment centers and beyond. The region's unemployed and welfare poor have often remained anchored in place, a stasis that has reinforced geographic disparities and muted any potential economic benefits from decades-long infusions of government funding to build Appalachia's physical infrastructure (e.g., highways, water and sanitation facilities) and to cultivate its human resources.

In this report, we have several specific objectives aimed at elucidating recent changes in patterns of Appalachian population change and migration. First, we describe patterns of migration between Appalachia and the rest of the nation during the 1990s and early 2000s as an indirect indicator of economic conditions. Is Appalachia losing population in its exchange of people, including its most educated and skilled (the so-called "best and brightest"), with other regions of the United States? Second, we evaluate geographic disparities in flows of population within Appalachia, including migration flows between Appalachian metropolitan and nonmetropolitan counties classified according to the Appalachian Regional Commission's (ARC) distress code. Third, we examine patterns of educational selectivity among inter-county migrants—i.e., whether some kinds of Appalachian counties have lost their young and most highly educated

people while other people have become essentially ghettoized in place. Fourth, we document some of the dominant migration streams within Appalachia and between Appalachia and other regions by using the 2000 county-to-county migration file from the 2000 Census.

The Legacy of Economic Underdevelopment and Out-migration

During the 1980s, the Appalachian population of slightly over 20 million people increased by a mere 372,000 people (Matthews 1999). The region lost 410,000 more people to out-migration than it gained through in-migration (i.e., net out-migration) from the rest of the nation. In fact, without natural increase—the difference between births and deaths—Appalachia would have experienced population decline rather than population growth during the 1980s. Significantly, population growth and net migration over this period were distributed unevenly over geographic areas and population subgroups. Much of the population growth from in-migration was concentrated in the southern tier of Appalachia counties, especially in the economically prosperous metropolitan areas of Georgia and the Carolinas; in suburban counties (i.e., those adjacent to metropolitan counties with central cities); and in nonmetropolitan counties in close proximity to growing metropolitan regions. Among others, these counties included areas surrounding Atlanta; Asheville and Winston-Salem, N.C.; and Spartanburg, S.C. While the southern subregion of Appalachia experienced positive net migration between 1980 and 1990, the northern and central subregions of Appalachia lost population through out-migration to other regions in Appalachia and to the rest of the country (Matthews 1999).

Not surprisingly, distressed and transitional Appalachia counties experienced rapid net out-migration during the 1980s. These counties, as defined by the Appalachian Regional Commission, include those with high unemployment rates, low income, and poverty rates exceeding 150 percent of the U.S. average (McLaughlin et al. 1999). The statistical association between economic underdevelopment and out-migration has been unmistakable. Among the 363 distressed and transitional Appalachia counties, for example, only 107 (or 30 percent) experienced net in-migration during the 1980s. Many isolated rural counties are located well beyond the economic influence of major metropolitan employment centers (Matthews 1999). Indeed, only 18 percent of Appalachia's completely rural counties that are nonadjacent to metropolitan counties experienced net in-migration during the 1980s. Migration patterns in the Appalachian region have clearly favored metropolitan cities and regions at the expense of smaller nonmetropolitan counties and rural communities.

In fact, 83 percent of the region's metropolitan counties located at the fringe of central city counties of 1 million population or more experienced net in-migration (Matthews 1999). These economically prosperous Appalachian cities and suburbs no longer share the chronically depressed conditions that have plagued many isolated rural U.S. counties for decades. The statistical evidence of spatial convergence in economic and social indicators between Appalachia and the rest of the nation, however, can leave the mistaken impression of widespread economic progress. Optimistic regional averages hide tremendous variation in economic conditions and associated migration patterns found throughout Appalachia. Many Appalachia rural counties continue to lose population through heavy out-migration. These demographic trends largely reflect a

continuing lack of economic development and job growth, especially new employment that pays a living wage. And while Appalachia's poverty rate was only slightly higher than the nation's in the mid-1990s, for the first time on record, the number of distressed counties in Appalachia actually grew by nearly 50 percent between 1980 and 1990 (Applied Population Laboratory 2000). Only 21 counties were declassified as "distressed" counties between 1988 and 1995 (Glasmeier and Fuelhart 2000).

Historically, out-migration from rural America overall has been highly selective on a number of migrant characteristics, including age and education (Lichter et al. 1995). During the 1985-90 period, for example, Matthews (1999) showed that Appalachia experienced modest in-migration of young adults—those in the prime reproductive ages who help replenish aging populations and provide hope for the future. This new pattern of net in-migration of young adults, however, was concentrated almost entirely in the southern Appalachian subregion and in counties classified as "competitive" and "attainment" in ARC distress code. Both northern and central Appalachia lost young adults and their children to net out-migration, as did counties classified by the Appalachian Regional Commission as "distressed." The counties with net out-migration of young adults also experienced net out-migration of persons with a college education or more, while attracting more in-migrants with less than a high school education than they exported (Matthews 1999).

Such geographic disparities in migration flows and the characteristics of recent migrants have arguably exacerbated spatial economic inequality in Appalachia. Net out-migration rates in some counties were exceptionally high (Matthews 1999). McDowell County, W. Va., for example, lost about 25 percent of its young adult population, on

balance, as a result of the surfeit of out-migration over in-migration. The county also experienced a net out-migration rate among college-educated persons of 29 percent. At the other extreme, Gwinnett County, an affluent suburban county outside of Atlanta, experienced net in-migration of young adults of 41 percent and had a net inflow of more than 27,000 college-educated persons (or 48.6 per 100 population). These results alone clearly dramatize the exceptional variability of trends in economic conditions—and prospects for the future—within the Appalachian region. The results also have raised important policy questions concerning migration patterns in Appalachia over the ensuing period of the 1990s, when the nation experienced unprecedented job growth and low unemployment. Have Appalachia’s historically disadvantaged rural areas experienced a new economic prosperity that is reflected in greater retention of its young people and the ability to attract new workers from outside the region?

Appalachia Out-migration in the 1990s: A Period of Transition?

Early results from the 2000 Census indicated that the region’s general patterns of population in the 1980s continued into the 1990s. For example, as in the 1980s, Appalachia’s population grew somewhat more slowly (at 9 percent) than the nation as a whole (at 14 percent) during 1990-2000 (Pollard 2003). Moreover, the southern subregion of Appalachia had a rate of population growth (18 percent) that exceeded the growth rate for the rest of the country. Population growth was especially rapid in Appalachian Georgia (43 percent), reflecting the economic influence of nearby Atlanta and Fulton County. Appalachia’s metropolitan counties also grew slightly more rapidly

than its nonmetropolitan counties (9.5 versus 8.6 percent), indicating a pattern of population concentration or continuing urbanization within the region.

Population Change in the 1990s and Beyond. In this report, we build on Pollard's (2003) census analysis of population change in Appalachia by disaggregating population change into its demographic components—natural increase (i.e., births minus deaths) and net migration (i.e., in- minus out-migration)—in Appalachia for the 1990-1999 and 2000-2002 periods. For our purposes, we use annual population estimates provided by the Census Bureau's Federal State Cooperative Program for Population Estimates (see U.S Census Bureau 2004).² To make appropriate annual comparisons between 1990-1999 (a nine-year period) and 2000-2002 (a two-year period), we calculated annualized population growth rates.³ These estimates, like other recent analyses based on decennial census counts, indicate that population increased less rapidly in Appalachia (0.74 percent per annum) than in the rest of the nation (1.06 percent per annum) during the 1990s (see Table 1, page 8). Moreover, the resurgence of population growth in Appalachia, first revealed in the 1990s, continued into the early 2000s but at a slightly lower rate than the preceding decade. During 2000-2002, the Appalachia

² Reliable data are not available for the 1999-2000 period because the July 1, 2000 estimates were benchmarked to the 2000 Census population results, which exceeded counts based on pre-2000 estimates. (Estimates for previous years during the 1990s had been benchmarked to the 1990 Census population results.) Our analysis therefore underestimates the absolute level of population change but not comparative patterns of population change between Appalachia and the rest of the nation. Indeed, for the 1990-1999 period, the Census Bureau's estimates suggest that population in the United States increased by 23.2 million people. The 2000 Census indicates that population increased by 32.7 million.

³ Annualized net migration rates are calculated as follows:

$$(\text{net migration}_{t(1) \dots t(1)+n}) / [(\text{population}_{t(1)})(n)]100,$$

where $t(1)$ is time 1 and n is the number of years. Population changes measured over longer periods are, by definition, more likely to experience larger population changes, hence the need to standardize the metric for comparison by annualizing population change.

population increased at roughly one-half the growth rate as the rest of the nation (0.62 vs. 1.13 percent per annum).

Table 1
Population growth and annualized growth rate (percent), United States and Appalachia, 1990-1999 and 2000-2002

PERIOD	UNITED STATES		APPALACHIA		NON-APPALACHIAN U.S.	
	Population growth	Rate	Population growth	Rate	Population growth	Rate
1990-1999	23,226,417	1.03	1,400,474	0.74	21,825,943	1.06
2000-2002	6,144,350	1.09	282,239	0.62	5,862,111	1.13
1990-2002	38,904,302	1.30	2,194,299	0.87	36,710,003	1.34

NOTE: Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

This analysis of population growth rates provides a first step towards a better understanding of population redistribution in Appalachia, but it does not reveal much information about emerging migration patterns that fuel population growth, the sociodemographic characteristics of the people who moved into or out of Appalachian counties, or the origins and destinations of Appalachia’s recent migrants. We now turn to these issues.

Demographic Components of Population Change. Population growth reflects both natural increase and net migration. The vital registration data compiled by the U.S. Census Bureau’s population estimates and projections program and reported in Table 2 suggest that the Appalachian population experienced a significant upsurge in population growth in the 1990s—a growth that continued into the early 2000s (see Table 2, page 9).

Table 2
Components of population change in Appalachia
1990-1999 and 2000-2002

PERIOD	NATURAL INCREASE	NET MIGRATION	TOTAL CHANGE
1990-1999	535,039	887,772	1,400,474
2000-2002	88,245	198,178	282,239

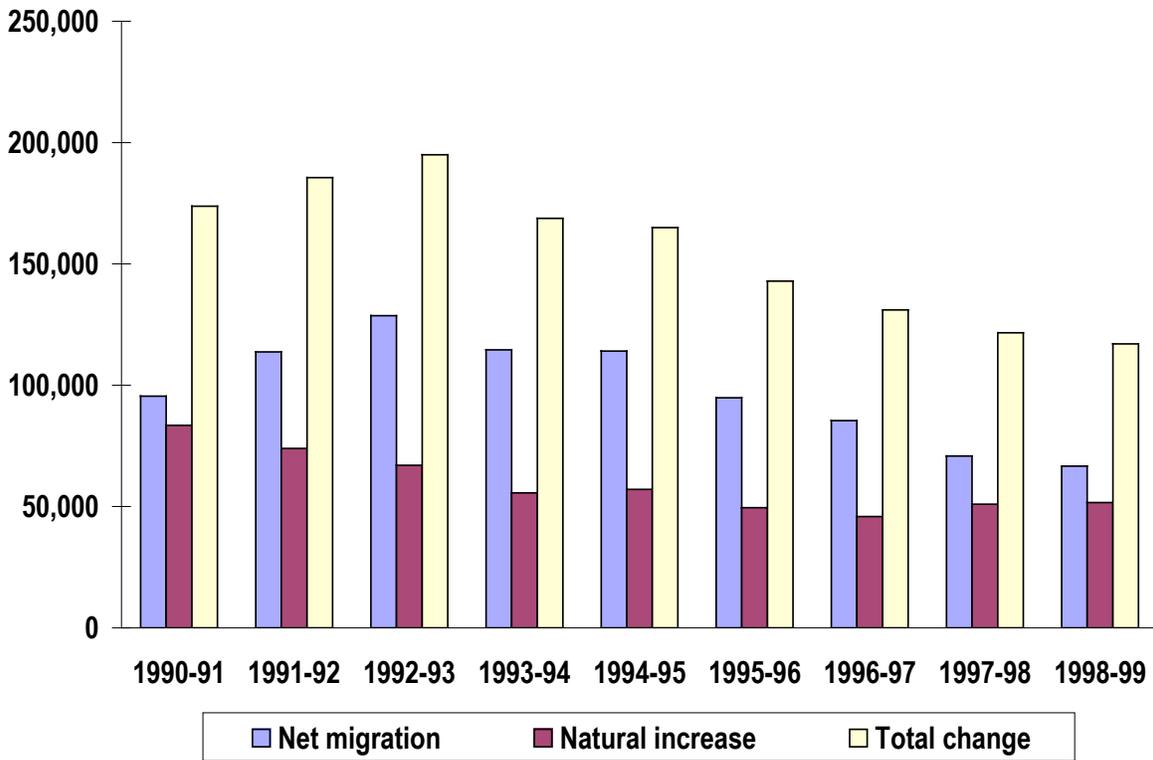
NOTE: Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

Unlike the 1980s, when the population of Appalachia increased by less than 400,000 people and experienced net out-migration (McLaughlin et al. 1999), the 1990s and early 2000s were a period of unprecedented growth. During the first nine years of the 1990s, for example, the Census Bureau’s population estimates indicated that Appalachia increased by 1.4 million people. It increased by nearly 300,000 between 2000 and 2002. Moreover, unlike the 1980s, when Appalachia grew only because of natural increase, population growth in Appalachia during the 1990s and early 2000s was fueled primarily by in-migration rather than natural increase. Indeed, during the 1990s, over 60 percent of the growth in Appalachia was due to net in-migration—the excess of in-migrants over out-migrants.

Figure 1 (page 10) presents the annual components of population change (net migration and natural increase) in Appalachia for 1990-99. Appalachia grew during each year between 1990 and 1999, reaching its peak annual population growth of 194,926 persons during 1992-93. Moreover, net in-migration to the region outstripped natural increase as a source of population growth each year. The high point for natural increase was the first year of the decade (1990-91), when Appalachia experienced 83,406 more

Figure 1
Components of Population Change in Appalachia, 1990-1999



Source: U.S. Census Bureau.

births than deaths. Thereafter, the trend in natural increase leveled off at approximately 50,000 annually from 1995 through 1999. Net migration followed a pattern similar to that of the total population change, peaking in 1992-93 before slowly declining throughout the rest of the decade.

To briefly summarize, net migration rates of Appalachia were positive in the 1990s for the first time in decades, reflecting the new balance of in- and out-migration with the rest of the nation. Moreover, in some additional analysis (not shown), we

examined the county-to-county migration flow data from the 2000 Census.⁴ Here, inter-county migration is measured using the 5-year retrospective question about place of residence 5 years ago (i.e., in 1995). By comparing current residence with residence 5 years ago, we can measure migration flows between counties within Appalachia and between Appalachia and counties in the rest of the nation. This analysis indicated that 1.73 million Appalachian residents—almost 10 percent of the region’s population—moved from the Appalachian region to the non-Appalachian United States. Out-migration from the region was offset by 2.06 million in-migrants into Appalachia from the rest of the nation.

This means that Appalachia experienced a net migrant gain of roughly 330,000 persons in the exchange of population with the rest of the nation over the 1995-2000 period.⁵ This new development is significant and reinforces the results presented earlier using net migration rates based on the residual approach from vital statistics data (i.e., population change minus natural increase over the decade). At the same, Appalachian-to-non-Appalachian in-migration *rates* continue to exceed non-Appalachia-to-Appalachia out-migration rates. In fact, of Appalachia’s inter-county movers during 1995-2000, only a slight majority share moved to a county outside Appalachia rather than to another Appalachian county (1.73 million versus 1.54 million).

⁴ These data are identified as “Census 2000 Migration Data, Census of Population and Housing,” and were issued by the U.S. Census Bureau in October 2003. The mobility data come from Census 2000 long-form data on the “residence 5-years-ago” question. Along with gross and net migration data for various levels of geography, these data also include county-to-county migration flow data for counties by a limited number of selected characteristics.

⁵ This estimate is slightly less than one-half the estimate based on the Census Bureau’s annual estimates for 1990-99 (see Table 1).

New Patterns of Migration. During the 1990s, the annual net migration rate in Appalachia was 0.47 percent, or 4.7 persons per 1,000 population per annum. This rate exceeded the net migration rate for the rest of the nation, even though the nation's *population* growth rate in the 1990s was more rapid than in Appalachia. During the first two years of the 2000s, however, Appalachia returned to the familiar pattern of net migration rates that were lower than the rest of the nation (see Table 3).

Table 3
Net migration and annualized net migration rate (percent), United States and Appalachia, 1990-1999 and 2000-2002

PERIOD	UNITED STATES		APPALACHIA		NON-APPALACHIAN U.S	
	Net migration	Rate	Net migration	Rate	Net migration	Rate
1990-1999	7,306,765	0.33	887,772	0.47	6,418,993	0.31
2000-2002	2,905,530	0.51	198,178	0.43	3,055,792	0.52

NOTE: Estimates of 1999-2000 data are not available (see footnote 2). U.S. net migration reflects only international migration; Appalachian and non-Appalachian figures reflect both net domestic and international migration.

Source: U.S. Census Bureau.

The new in-migration to Appalachia has not been limited to a narrow segment of Appalachia's most prosperous subregions or counties. During the 1980s, the large majority of Appalachia counties experienced net out-migration (McLaughlin et al. 1999). But this pattern dramatically reversed itself during the 1990s, when roughly four out of every five Appalachian counties experienced population growth, and three-quarters experienced net in-migration (see Table 4, page 13). Although these percentages declined modestly in the early 2000s, nearly two-thirds of all Appalachian counties still grew or increased through positive net migration. Obviously, if the upsurge in population growth

and migration rates is our guide, then recent demographic trends in Appalachia are cause for new optimism about Appalachia’s future.

Table 4
Number and percent of counties experiencing positive growth and net in-migration in Appalachia, 1990-1999 and 2000-2002

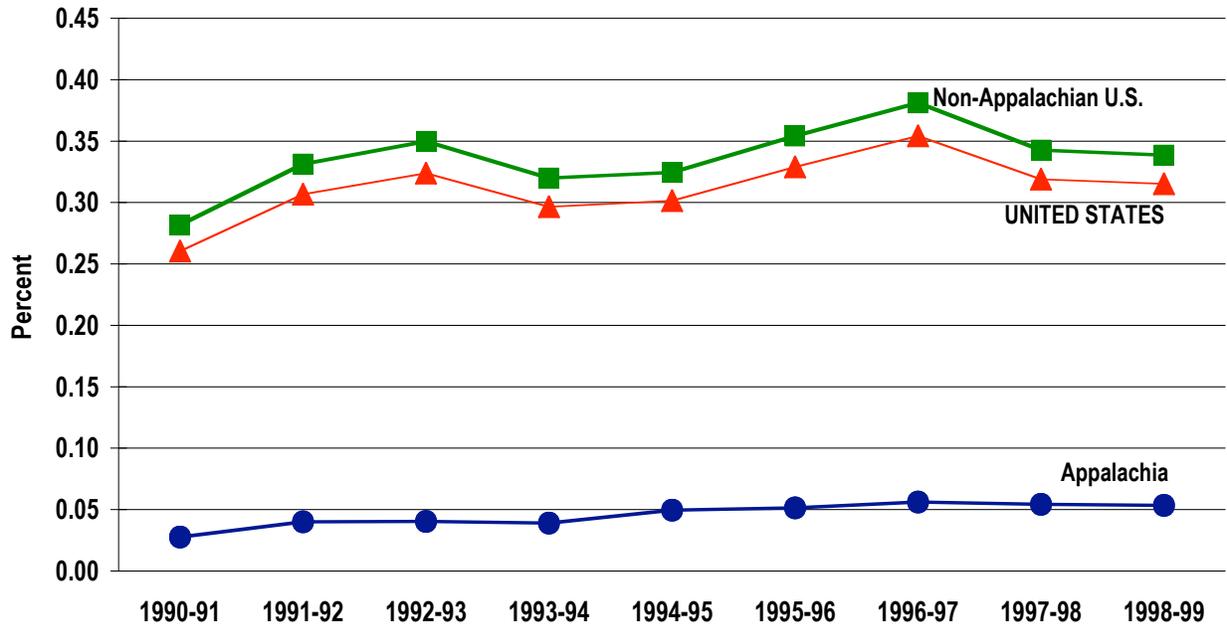
	1990-1999		2000-2002	
	Number of counties	Percent	Number of counties	Percent
Population growth	329	80.2	263	64.1
Net in-migration	307	74.9	261	63.7

NOTE: There are 410 counties in Appalachia. Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

Finally, immigration has been an important source of population growth in the United States over the past 25 years (Kritz and Gurak 2004). But this dynamic is arguably less true of Appalachia. Data presented in Figure 2 (page 14) clearly show that a shift from net out-migration to net in-migration largely reflects in-migration from outside the Appalachia region rather than from abroad. Throughout the 1990s, immigration rates into Appalachia were much lower than for the rest of the nation. Immigrants, especially Asians and those of Mexican origin, continued to be concentrated largely in so-called “gateway cities” such as New York City, Los Angeles, Miami, and other large metropolitan areas. Appalachia historically has not been a major regional destination for new immigrants (although some parts of the Carolinas and northern Georgia are exceptions), and there is little evidence that this pattern changed significantly in the 1990s. In fact, the foreign-born population in Appalachia in 2000 represented only 2.7 percent of its population (data not shown). This percentage falls far short of the

Figure 2
Net international migration rate (percent), United States, Appalachia, and non-Appalachian United States, 1990-1999



Source: U.S. Census Bureau.

percentage of U.S. total population that is foreign-born—11.1 percent, or 31.1 million (Malone et al. 2003).

Geographic Variation in Appalachian Growth and Migration

Regional Growth Disparities. A recurring theme of our analyses is that population and migration rates for the entire region mask widespread variation in trends in population change across the subregions of Appalachia. For example, the data in Table 5 (page 15) clearly demonstrate that the Appalachia’s southern subregion grew much faster than either northern or central Appalachia. Indeed, the annual growth rate in

Table 5
Annualized population growth rate (percent) and net county migration rate, by subregion, 1990-2000 and 2000-2002

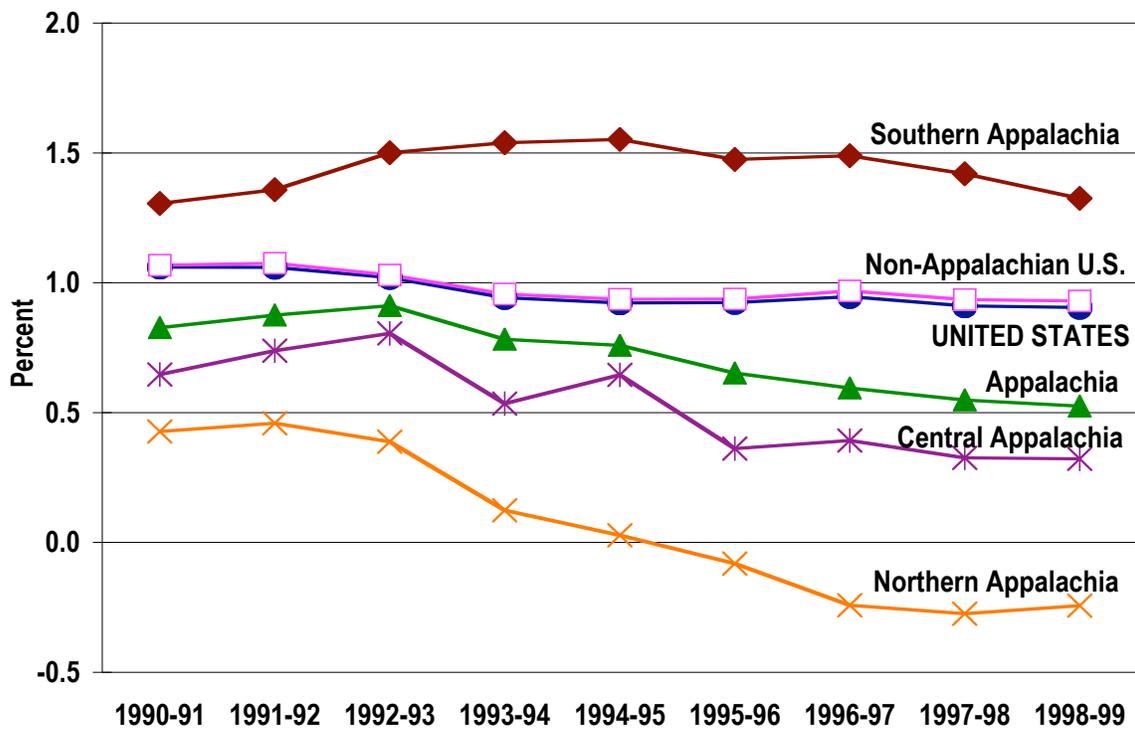
PERIOD	GROWTH RATE			NET MIGRATION RATE		
	Northern Appalachia	Central Appalachia	Southern Appalachia	Northern Appalachia	Central Appalachia	Southern Appalachia
1990-1999	0.06	0.54	1.53	-0.02	0.34	1.04
2000-2002	-0.02	0.20	1.30	0.02	0.18	0.87

NOTE: Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

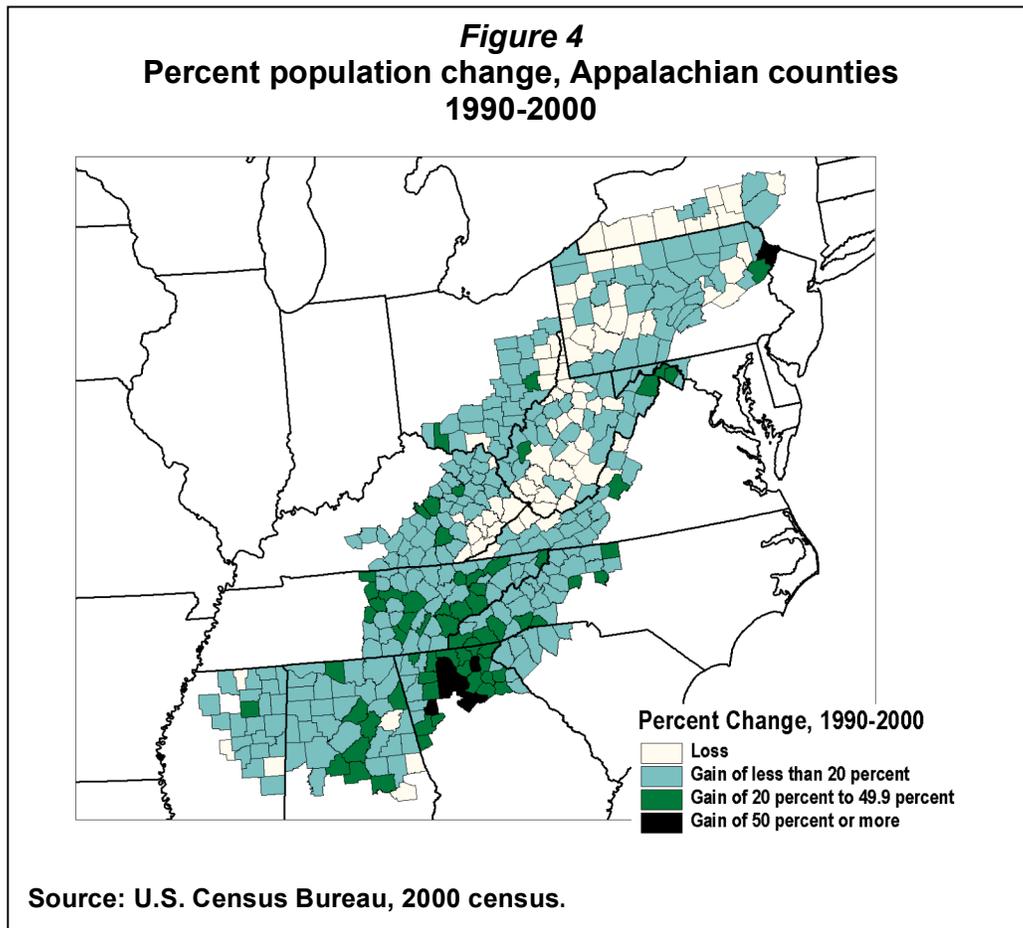
southern Appalachia exceeded rates for the nation overall and the non-Appalachian United States (Figure 3).

Figure 3
Population change in Appalachian, Non-Appalachian United States, and Appalachian subregions, 1990-1999



Source: U.S. Census Bureau.

In contrast, central Appalachian counties grew at the sluggish rate of just over one-half percent per year during the 1990s. Still, this rate (0.54 percent annually on average) was roughly nine times the annual rate of population growth in northern Appalachia over the same period (0.06 percent). More significantly, the northern Appalachian subregion reverted to population decline in the early 2000s (-0.02 percent per annum). The annual population growth rate of central Appalachian counties also slowed significantly in the early 2000s (0.20 percent residents per year). In Figure 4, the regional map of Appalachia population change clearly illustrates this point.



Significantly, most of the Appalachian parts of the 13 states comprising the region experienced net in-migration (see Table 6). Only Appalachian New York and

Table 6
Annualized population growth rate (percent) and net migration rate (percent), Appalachian regions, by state 1990-1999 and 2000-2002

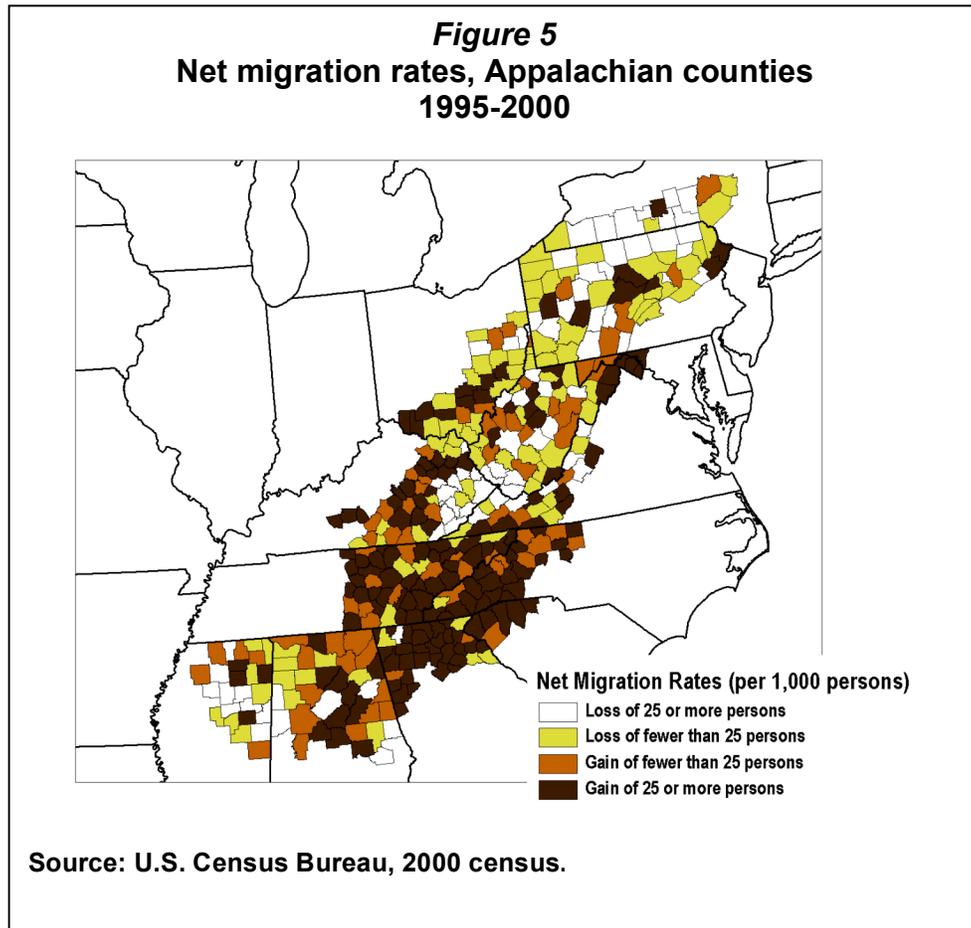
STATE	1990-1999		2000-2002	
	Growth rate	Net migration rate	Growth rate	Net migration rate
Alabama	0.95	0.42	0.48	0.14
Georgia	3.86	2.90	3.72	2.73
Kentucky	0.65	0.34	0.35	0.23
Maryland	0.17	0.00	0.33	0.33
Mississippi	0.63	0.15	0.12	-0.40
New York	-0.26	-0.49	0.06	0.02
North Carolina	1.23	0.99	0.90	0.69
Ohio	0.73	0.42	0.31	0.08
Pennsylvania	-0.06	-0.08	-0.12	0.00
South Carolina	1.29	0.82	1.15	0.77
Tennessee	1.24	0.94	0.73	0.58
Virginia	0.16	0.13	-0.06	0.03
West Virginia	0.09	0.05	-0.15	-0.06

NOTE: Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

Pennsylvania experienced net out-migration in the 1990s, and Appalachian Mississippi and West Virginia in the early 2000s. The regional upsurge in population growth and net migration also has been geographically widespread. However, 10 of the 13 states experienced slower annualized growth from net migration in the early 2000s than in the 1990s. Appalachian Georgia continued to experience much higher rates of net migration (2.73 percent per annum in the 2000s) than other states in the Appalachian region or

Appalachia as a whole (0.47 percent; see Table 3, page 12). Geographic diversity in migration patterns can perhaps be seen most easily in Figure 5, which maps county net migration rates in the Appalachia region during 1995-2000.



Migration Patterns in Nonmetropolitan and Distressed Counties. Nationwide, nonmetropolitan counties experienced net in-migration of 3.5 million people at the expense of metropolitan areas during the 1990s (Johnson 1999). This trend represented a clear departure from the 1980s, when nonmetropolitan U.S. counties lost a total 1.4 million people through out-migration, and only 27 percent of these counties experienced net in-migration. During the 1990s, however, almost 70 percent of nonmetropolitan U.S.

counties gained population through net in-migration (Johnson 1999), although the rural rebound has slowed somewhat in recent years (McGranahan and Beale 2002).

In general, nonmetropolitan counties in Appalachia have experienced migration patterns similar to the nation's (see Table 7). During the 1990s, nonmetropolitan areas (defined in 1999) experienced an annualized net migration rate of 0.49 percent per annum, compared with a rate of 0.46 percent in metropolitan areas. This rate represents a significant change from the 1980s, when nonmetropolitan Appalachia lost 410,000 persons to out-migration to metropolitan areas (McLaughlin et al. 1999). By the beginning of the 21st century, however, Appalachia returned to its historic pattern of more rapid net in-migration in metropolitan than nonmetropolitan areas (0.53 percent versus 0.30 percent per annum).

Table 7
Annualized net migration rate (percent) in metropolitan and nonmetropolitan Appalachia, 1990-1999 and 2000-2002

	1990-1999	2000-2002
Metropolitan Appalachia	0.46	0.53
Nonmetropolitan Appalachia	0.49	0.30
Total Appalachian Region	0.47	0.43

NOTE: Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

Previous research suggests that population growth and migration rates—both in Appalachia and elsewhere—are strongly affected by economic conditions (Applied Population Laboratory 2000). The data reported in Table 8 highlight once again the significance of local economic conditions; indeed, growth rates and net migration rates

vary widely across counties distinguished by the county distress codes assigned by ARC. Every year the economic status of each county in the Appalachian region is assessed, and each county is assigned to one of four economic categories, listed here in order from lowest to highest well-being: distressed, transitional, competitive, and attainment. This typology is based on the county's poverty rate, unemployment rate, and per capita income (Appalachian Regional Commission 2004b).

Table 8
Annualized population growth rate (percent) and net migration rate (percent), Appalachia, by distress level 1990-1999 and 2000-2002

DISTRESS LEVEL	1990-1999		2000-2002	
	Growth rate	Net migration rate	Growth rate	Net migration rate
Attainment	1.15	0.71	1.44	0.96
Competitive	1.70	1.05	1.77	1.25
Transitional	0.61	0.40	0.39	0.30
Distressed	0.33	0.16	-0.07	-0.12

NOTE: Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

In Table 8, Appalachia's competitive counties had the highest growth and net migration rates in the region for both the 1990-1999 and 2000-2002 periods.⁶ From 1990-1999, the growth rate for competitive counties was 1.7 percent, and the net migration rate was 1.05 percent. In the 2000-2002 period, the growth rate for these counties was 1.8 percent and the migration rate was 1.2 percent, slightly higher than the previous period.

⁶ As before, these analyses are based on annual population and migration estimates from the U.S. Census Bureau's Federal State Cooperative Program for Population Estimates.

True to historical norms, distressed counties experienced the least amount of growth and net migration in Appalachia: They grew by only 0.3 percent annually from 1990-1999, while experiencing a net migration rate of only 0.2 percent for the period. From 2000-2002, the growth rate and the net migration rate were slightly negative, both at -0.1 percent per annum.

These results are reinforced in Table 9, which provides the number and percentage of counties experiencing population growth and net in-migration for Appalachian counties classified using the ARC's distress code. As expected, the competitive and attainment counties had the highest percent of counties with positive growth and net in-migration, while the distressed and transitional counties had the lowest percent. Significantly, the distressed and transitional counties also experienced *declines* in the percent of counties experiencing positive growth and net in-migration from the

Table 9
Number and percent of counties experiencing positive growth and net in-migration in Appalachia, 1990-1999 and 2000-2002

DISTRESS LEVEL	GROWTH / MIGRATION	1990-1999		2000-2002	
		Number of counties	Percent of counties	Number of counties	Percent of counties
Attainment	Population growth	8	88.9	8	88.9
	Net in-migration	8	88.9	7	77.8
Competitive	Population growth	19	90.5	20	95.2
	Net in-migration	19	90.5	19	90.5
Transitional	Population growth	209	80.7	174	67.2
	Net in-migration	199	76.8	171	66.0
Distressed	Population growth	93	76.9	61	50.4
	Net in-migration	81	66.9	64	52.9

NOTE: Estimates of 1999-2000 data are not available (see footnote 2).

Source: U.S. Census Bureau.

1990-1999 period to the 2000-2002 period. For 1990-1999, 76.9 percent of distressed counties had positive population growth. But from 2000-2002, only 50.4 percent of distressed counties saw their populations increase. For transitional and (especially) distressed counties in Appalachia, the prospect of continuing out-migration and population loss in the future is large.

Migration Streams Within and Between Appalachia and the Nation

Migration Streams. The preceding analyses of county net migration rates reveal little about the magnitude of in- and out-migration or about the origins of in-migrants or destinations of out-migrants. To examine such issues, we must turn to the Census Bureau's county-to-county migration file, which documents migration flows between Appalachia and the rest of the country (Table 10, page 23). These data indicate that 1.7 million people left Appalachia between 1995 and 2000, and 2.1 million moved into Appalachia. Although Appalachia experienced net in-migration of only 0.4 million people during 1995-2000, this figure resulted from a great deal of "churning" among inter-regional migrants (i.e., nearly 4 million moved between Appalachian and non-Appalachian counties). Appalachian migration therefore is inefficient if measured by the net redistribution of population from one region to another.

The bottom panel of Table 10 (page 23) also provides data on population flows between the Appalachian subregions and the rest of the country. Not surprisingly, the southern Appalachian region was the modal destination for immigrants to Appalachia. Over 1.2 million people moved into the southern region from the non-Appalachian United States, while 808,000 moved from southern Appalachia to a non-Appalachian

Table 10
Migration streams within and between Appalachian and non-Appalachian counties, 1995-2000

RESIDENCE IN 2000	RESIDENCE IN 1995	MIGRANT STREAM
Appalachian Region		
Outside Appalachia	Outside Appalachia	41,910,920
	Appalachia	1,732,484
Appalachia	Outside Appalachia	2,057,900
	Appalachia	1,539,173
Subregions		
Outside Appalachia	Outside Appalachia	41,910,920
	Central Appalachia	129,319
	Northern Appalachia	795,510
	Southern Appalachia	807,655
Central Appalachia	Outside Appalachia	153,518
	Central Appalachia	104,423
	Northern Appalachia	17,328
	Southern Appalachia	26,951
Northern Appalachia	Outside Appalachia	701,388
	Central Appalachia	17,209
	Northern Appalachia	576,574
	Southern Appalachia	13,548
Southern Appalachia	Outside Appalachia	1,202,994
	Central Appalachia	36,999
	Northern Appalachia	26,268
	Southern Appalachia	719,873

Source: U.S. Census Bureau, 2000 census.

county. Net in-migration in southern Appalachia from outside of Appalachia contrasts sharply with patterns in northern and central Appalachian regions. For example, the northern subregion experienced in-migration of 701,000 people from outside of Appalachia, while losing even more people—nearly 796,000—to other regions of the

country. Unexpectedly, the central subregion—traditionally the poorest and most economically underdeveloped in Appalachia—gained also 154,000 person from non-Appalachia areas, while losing only 129,000 to non-Appalachian areas. Although the exchange of migrants between the central and northern subregions was roughly equal (17,000), about 10,000 more people left central Appalachia for the southern subregion between 1995 and 2000 than arrived from the South. About 13,000 more Appalachians moved from the northern subregion to the southern subregion than its counter-stream. Clearly, inter- and intra-regional migration streams were most supportive of population growth in the southern Appalachian counties and less supportive in northern Appalachia.

For illustrative purposes, we also examined migration flows for some specific cases—Appalachian counties with the highest volume of net out-migration or net in-migration during the period 1995-2000. These data are reported in Table 11 (page 25). All but two of the top 10 counties with the highest volume of net in-migration were located in the southern Appalachian subregion. In contrast, all 10 of the population losers except one (Jefferson County, Ala.) were located in the Appalachia's northern region. In the last column of Table 11, we also report median family income in 1999 for the counties. These data point to a familiar conclusion: Counties with net out-migration typically have substantially lower median family income than counties that experienced net in-migration during the 1995-2000 period. These income differences can be very large. For instance, the median family income in Forsyth County, Ga., was \$74,003, and Forsyth County had a very high rate of net in-migration—roughly 275 per 1000 population from 1995 to 2000. These figures compares with a median family income of \$39,318 and a net migration rate of -70.61 in Cattaraugus County, N.Y.

Table 11
Appalachian counties with the highest net in- and out-migration flows, 1995-2000

HIGH NET IN-MIGRATION	Inflow	Outflow	Net flow	Rate (per 1,000 persons)	Metropolitan Status¹	Median Family Income, 1999 (dollars)²
Gwinnett County, Ga.	177,381	113,548	63,833	108.5	Metropolitan	66,693
Forsyth County, Ga.	40,199	13,066	27,133	275.7	Metropolitan	74,003
Cherokee County, Ga.	45,737	24,557	21,180	149.3	Metropolitan	66,419
Shelby County, Ala.	42,761	22,806	19,955	139.3	Metropolitan	64,105
Paulding County, Ga.	28,296	12,041	16,255	199.0	Metropolitan	56,039
Greenville County, S.C.	72,579	57,276	15,303	40.3	Metropolitan	50,332
Centre County, Pa.	41,632	28,895	12,737	93.8	Metropolitan	50,557
Monroe County, Pa.	34,070	21,963	12,107	87.3	Nonmetropolitan	51,995
Montgomery County, Va.	38,600	27,176	11,424	136.6	Nonmetropolitan	47,239
Hall County, Ga.	26,887	17,596	9,291	66.7	Nonmetropolitan	50,100
HIGH NET OUT-MIGRATION	Inflow	Outflow	Net flow	Rate (per 1,000 persons)	Metropolitan Status¹	Median Family Income, 1999 (dollars)
Allegheny County, Pa.	113,490	161,247	-47,757	-37.3	Metropolitan	49,815
Jefferson County, Ala.	77,674	99,591	-21,917	-33.1	Metropolitan	45,951
Cortland County, N.Y.	8,870	18,357	-9,487	-195.2	Nonmetropolitan	42,204
Broome County, N.Y.	26,322	35,580	-9,258	-46.2	Metropolitan	45,422
Kanawha County, W.Va.	21,529	29,939	-8,410	-42.0	Metropolitan	42,568
Chenango County, N.Y.	6,641	12,583	-5,942	-115.6	Nonmetropolitan	39,711
Cattaraugus County, N.Y.	11,136	17,064	-5,928	-70.6	Nonmetropolitan	39,318
Steuben County, N.Y.	11,614	17,163	-5,549	-56.2	Nonmetropolitan	41,940
Westmoreland County, Pa.	38,152	43,494	-5,342	-14.4	Metropolitan	45,996
Beaver County, Pa.	16,937	22,191	-5,254	-29.0	Metropolitan	45,495

NOTES:

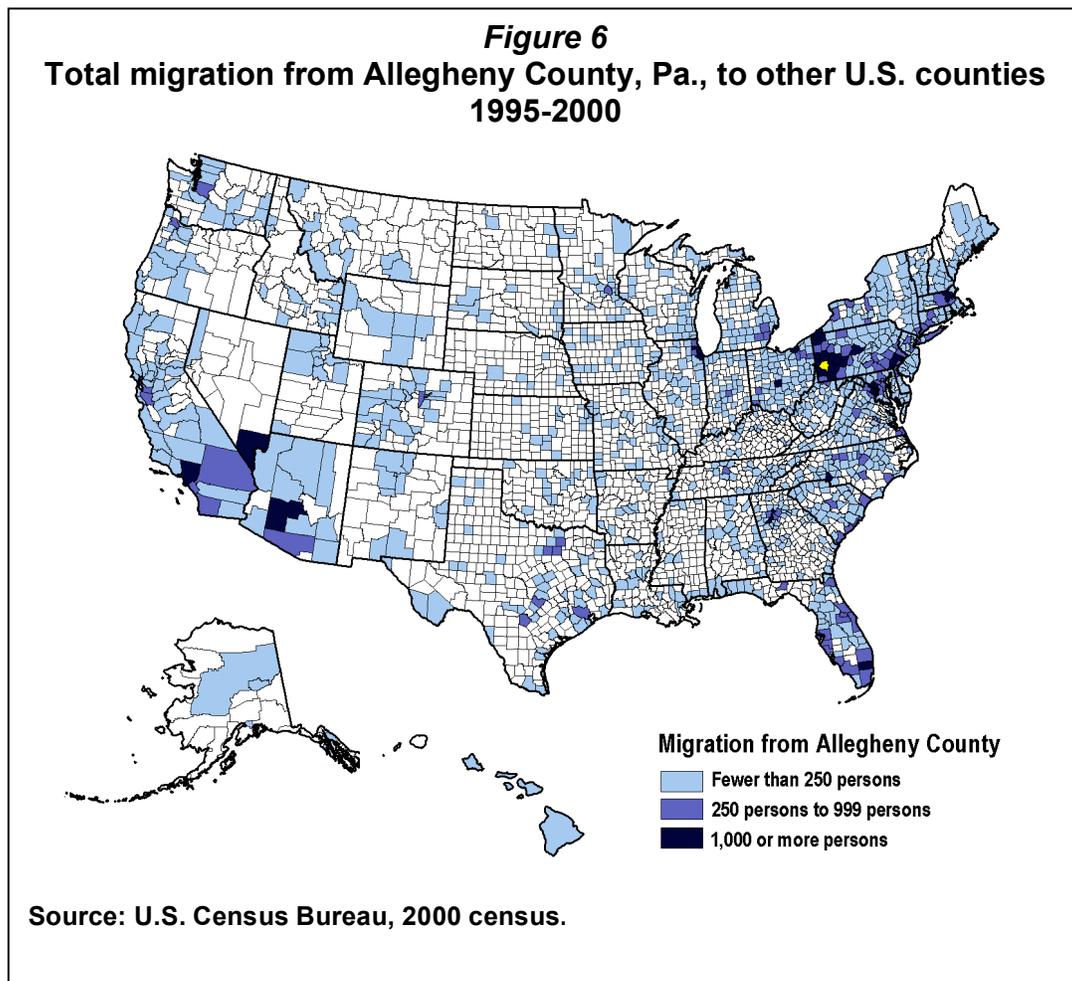
¹ Metropolitan areas contain an urban core of at least 50,000 population, plus surrounding areas with strong economic ties to the core.

² The median family income for Montgomery County, Va., does not include Radford city (where the median family income was \$46,332).

Source: U.S. Census Bureau, 2000 census.

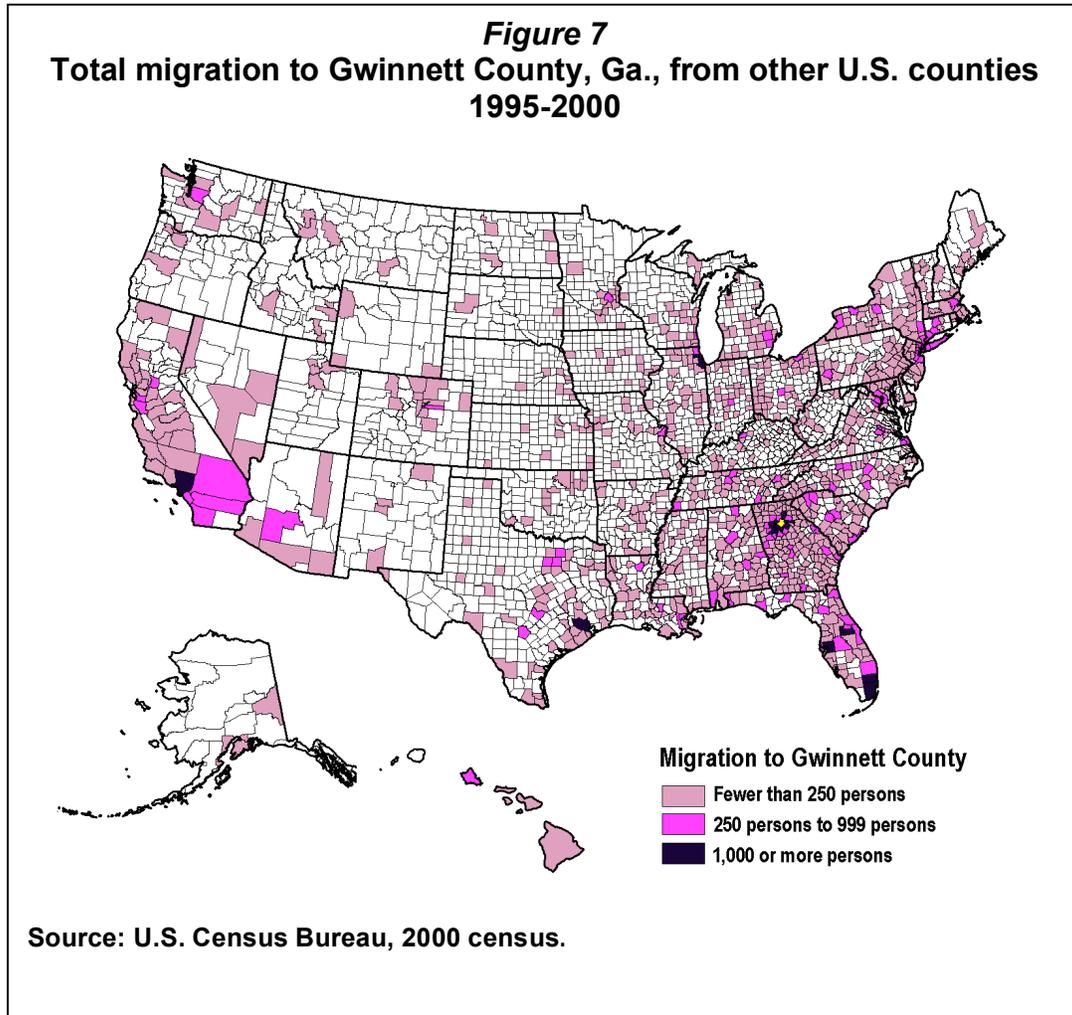
It is difficult to generalize about the destinations of out-migrants from high out-migration counties in Appalachia. As one example, the map in Figure 6 (page 26)

illustrates the destination locations of the 47,757 out-migrants from Allegheny County (Pittsburgh, Pa.) to other parts of the country. Much of the out-migration was into surrounding counties and to other parts of Pennsylvania (a pattern consistent with “gravity models,” which population geographers use to suggest that population is drawn like the force of gravity to larger cities and regions). On the other hand, southern California and Florida also were destinations for these out-migrants.



While the destinations of out-migrants are relatively concentrated, the origin of in-migrants to high net in-migration counties is geographically diffuse. Gwinnett County, Ga., for example, is a metropolitan fringe county adjacent to Fulton County (Atlanta).

The origins of the 177,000 in-migrants to Gwinnett County between 1995 and 2000 were dominated by Atlanta but also scattered widely throughout the country (see Figure 7).



Migration of College Educated Population. As we have shown, Appalachia as a region experienced net in-migration during the 1995-2000 period. Moreover, the region (particularly in the southern tier of Appalachian counties) grew at the expense of non-Appalachia counties. However, as shown in Table 12 (page 28), Appalachia nevertheless continued to lose its most highly educated population to non-Appalachia counties. Indeed, about 25,000 more people with college or graduate degrees left the Appalachian

Table 12
Appalachian net internal migration, by education, 1995-2000

HIGHEST EDUCATION LEVEL	NET MIGRATION
Less than high school diploma	46,468
High school graduate	85,993
Some college, no degree	69,902
Associate degree	14,336
Bachelor's degree	-19,359
Graduate or professional degree	-6,402

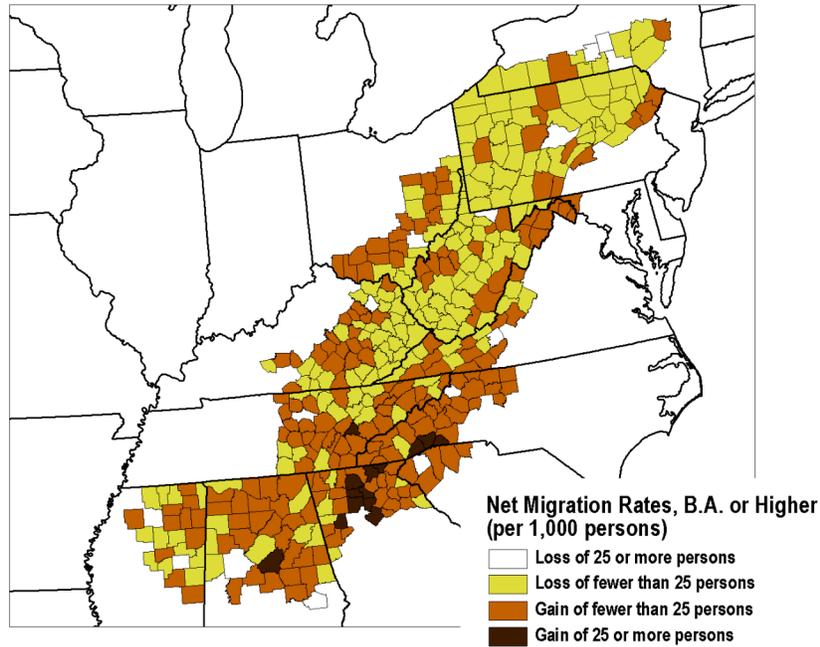
Source: U.S. Census Bureau, 2000 census.

region than entered it between 1995 and 2000. Appalachia experienced net in-migration of all lower-educated population groups—i.e., those lacking a college degree. For the region, *all* of the positive net migration during the 1995-2000 period is accounted for by in-flows of the

least educated. Clearly, the positive quantitative shifts in the volume of migration have not been matched by qualitative shifts in the flow of human resources into the Appalachian region.

At the same time, the geographic distribution of Appalachian net in-migration of the college educated was uneven (see Figure 8, page 29). Not surprisingly, rapid rates of net in-migration of the college educated occurred primarily in the southern Appalachian region. On the other hand, much of New York and Pennsylvania (as well as southwestern West Virginia and eastern Kentucky) experienced high rates of in-migration of the college-educated. Table 13 (page 30) shows the Appalachia counties with the highest rates of net in-migration and net out-migration of the college-educated population. Gwinnett County, Ga., was a high net in-migration county overall, and also was the most common destination in the region for highly educated in-migrants. Of the 177,381 in-migrants to this county between 1995 and 2000, 47,579 (or 28 percent) had a college degree or more.

Figure 8
Net migration rates for persons ages 25 and over with a college degree or more, Appalachian counties, 1995-2000



Source: U.S. Census Bureau, 2000 census.

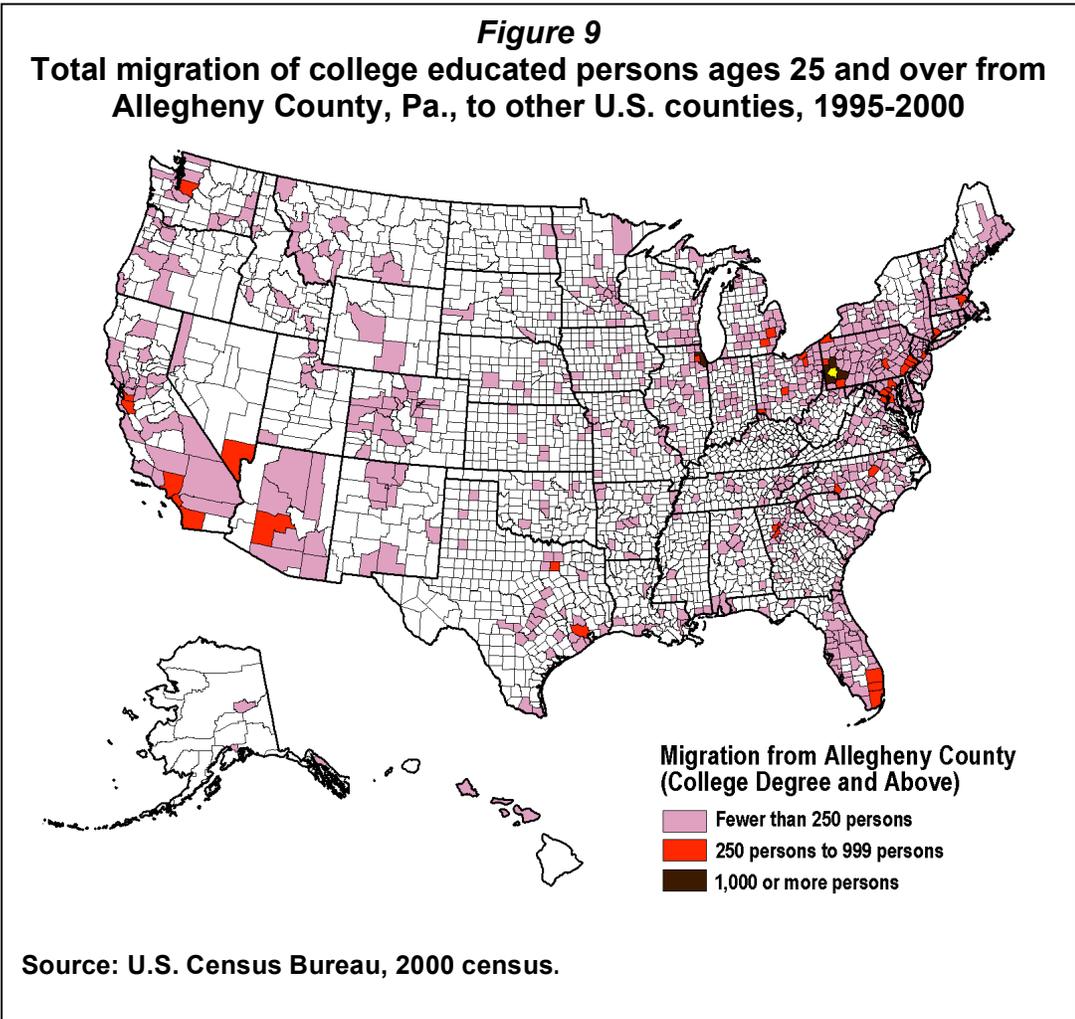
Among high net out-migration counties, Allegheny County experienced out-migration of 55,112 college-educated persons, or 34 percent of the county's 161,247 total out-migrants. The out-migration from Allegheny is heavily concentrated in adjacent metropolitan and nonmetropolitan counties (see Figure 9, page 31). In other words, this pattern reflects the suburbanization of affluent people to the Pittsburgh suburbs and exurbs. Their destinations also included other regions with burgeoning employment opportunities, such as Southern California, the eastern seaboard states, and Florida. Gwinnett County, Ga., a suburban county next to Atlanta, attracted more highly educated migrants than any other county in Appalachia, drawing a large number from Fulton County (Atlanta) and other parts of the Southeast (see Figure 10, page 32).

Table 13
Appalachian counties with the highest net in- and out-migration flows, persons
ages 25 and over with a college education or higher, 1995-2000

HIGH NET IN-MIGRATION	Inflow	Outflow	Net flow	Rate (per 1,000 persons)	Metropolitan Status
Gwinnett County, Ga.	47,759	27,598	20,161	34.3	Metropolitan
Forsyth County, Ga.	14,229	2,676	11,553	117.4	Metropolitan
Shelby County, Ala.	15,063	6,810	8,253	57.6	Metropolitan
Cherokee County, Ga.	11,388	4,949	6,439	45.4	Metropolitan
Greenville County, S.C.	17,756	13,254	4,502	11.9	Metropolitan
Buncombe County, N.C.	11,232	7,104	4,128	20.0	Metropolitan
Clermont County, Ohio	8,817	5,309	3,508	19.7	Metropolitan
Butler County, Pa.	7,959	5,101	2,858	16.4	Metropolitan
Henderson County, N.C.	5,025	2,311	2,714	30.4	Nonmetropolitan
Paulding County, Ga.	4,042	1,644	2,398	29.4	Metropolitan
HIGH NET OUT-MIGRATION	Inflow	Outflow	Net flow	Rate (per 1,000 persons)	Metropolitan Status
Allegheny County, Pa.	34,160	55,124	-20,964	-16.4	Metropolitan
Montgomery County, Va.	4,853	14,541	-9,688	-97.4	Nonmetropolitan
Centre County, Pa.	7,043	14,746	-7,703	-56.7	Metropolitan
Tompkins County, N.Y.	6,958	14,301	-7,343	-76.1	Nonmetropolitan
Tuscaloosa County, Ala.	4,396	10,512	-6,116	-37.1	Metropolitan
Jefferson County, Ala.	20,676	26,378	-5,702	-8.6	Metropolitan
Broome County, N.Y.	4,328	9,844	-5,516	-27.5	Metropolitan
Athens County, Ohio	2,019	7,297	-5,278	-84.8	Nonmetropolitan
Monongalia County, W.Va.	4,047	8,806	-4,759	-58.1	Nonmetropolitan
Knox County, Tenn.	16,661	20,765	-4,104	-10.7	Metropolitan

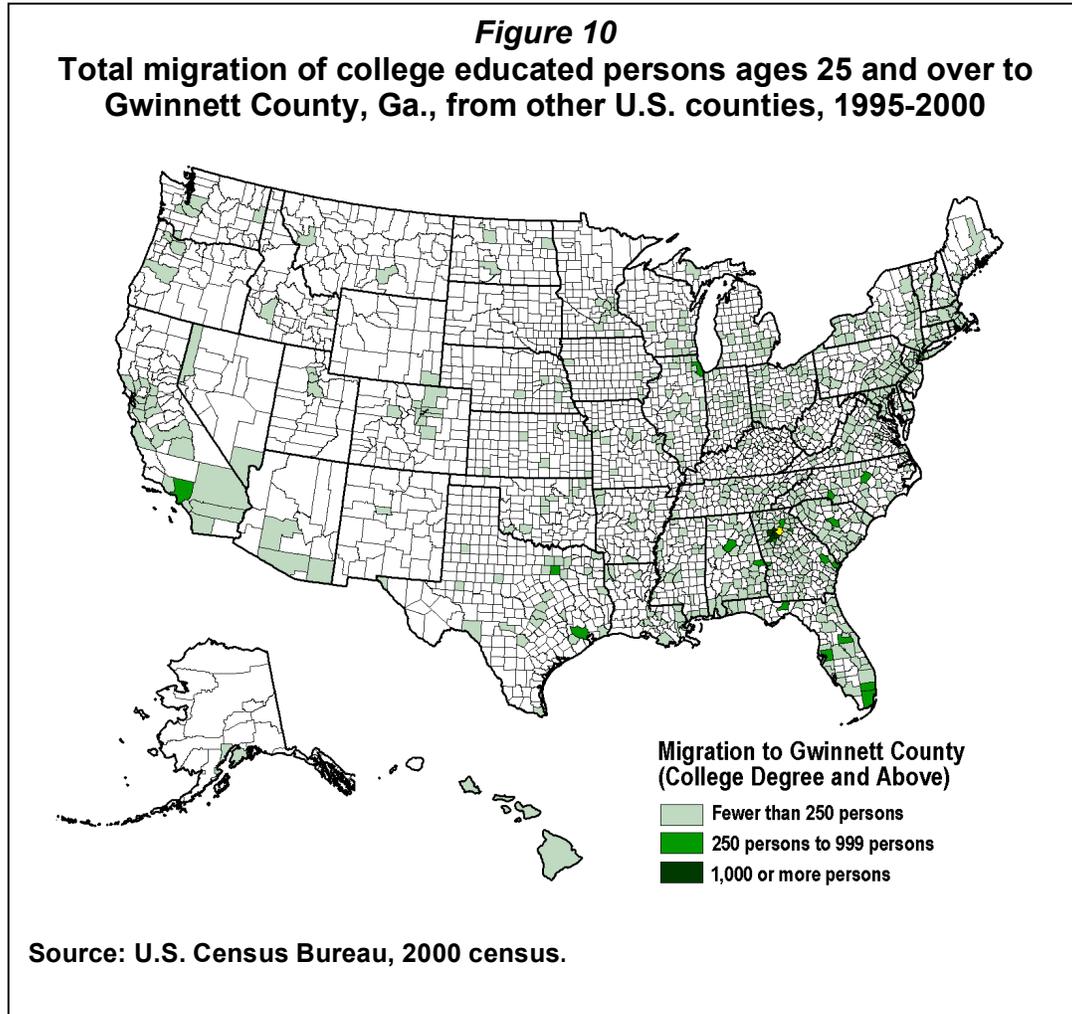
NOTE: Metropolitan areas contain an urban core of at least 50,000 population, plus surrounding areas with strong economic ties to the core.

Source: U.S. Census Bureau, 2000 census.



Conclusion

The decade of the 1990s ushered in major demographic shifts in the migration patterns of Appalachia. The historic pattern of net out-migration from Appalachia reversed in the 1990s. Nonmetropolitan Appalachia—typically the most economically depressed areas in the region—also grew at the expense of metropolitan counties in Appalachia and the rest of the country. The southern subregion in particular experienced rapid in-migration, especially in parts of northern Georgia and the Carolinas.



Significantly, out-migration from distressed Appalachian counties also slowed during the 1990s, especially in central Appalachia; and an increasing share of these counties experienced in-migration after decades of out-migration. Clearly, these are positive signs, especially if the new growth is a product of income and employment gains in the region.

On the downside, Appalachia—especially the northern subregion—continued during the most recent period to experience a net loss of human resources, both in quantitative and qualitative terms. Northern Appalachian continued to export population (and presumably jobs) to non-Appalachia counties and to the southern Appalachian

subregion. Appalachia's chronically depressed northern and central subregions also lost a disproportionate share of their "best and brightest." The net in-migration these subregions experienced during the 1990s was largely comprised of less educated populations. Such results speak to the limited pool of high-skilled work in the region, especially in comparison to other parts of the country, while also reinforcing the common perception that many parts of Appalachia simply lack the human resources (i.e., the skilled labor force) required today to attract high tech or high income jobs to the region.

In the final analysis, if out-migration is our measure, Appalachia has made great progress over the past decade or so. At the same time, much of Appalachia continues to lag behind the rest of the nation economically, and this gap is directly reflected in the region's migration patterns. Clearly, the optimistic picture painted by renewed growth in Appalachia overall must be balanced by other evidence showing that many parts of Appalachia have fallen farther behind Appalachian and U.S. averages. Migration patterns over the past decade indicate that Appalachia may have entered a transitional stage with an uncertain future. It remains unclear whether recent demographic trends portend continuing progress or a return to the past, and whether positive trends in some parts of Appalachia (e.g., southern Appalachia) are leading indicators that provide hope for other areas currently left behind.

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