Income Inequality and the Appalachian Region Before, During and After the Great Recession

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[1] This paper reports the results of research and analysis undertaken by a Census Bureau staff member. It has undergone a more limited review than official Census Bureau publications. This paper is presented to inform interested parties of research and to encourage discussion. The views expressed are those of the author and not necessarily those of the U.S. Census Bureau.

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Abstract

In the Appalachian region, historically, average and median household incomes are below the United States (US) average and median, poverty rates are higher, labor force participation rates are lower, and there are even greater disparities when one considers the region's more distressed counties. Since the advent of the war on poverty in 1964, however, the Appalachian region has made progress, but the region's households still remain poorer relative to the overall US. The most recent economic downturn had, and continues to have, an adverse impact on the incomes of a large number of the US households. Between September 2007 and 2008, US households lost an estimated $9.9 trillion in real total wealth because of declines in the housing and financial markets. Moreover, the income gap between the very rich (top one-percent) and the poor (the bottom 20 percent) tripled. This paper looks at the impact of the most recent economic downturn on the Appalachian region, relative to the entire U.S. Using data from the American Community Survey (ACS), annual household incomes in the Appalachian region are assessed before (2006), during (2008), and after (2010) the most recent economic downturn. Preliminary estimates suggest that Appalachian households had a median annual income that was 81 percent of the U.S. median annual household income during this time. In addition, this paper will investigate the position of the incomes Appalachian households relative to the U.S. household income distribution.

JEL: I3, D31, Z13

Keywords: Appalachian region, income inequality, great recession.

1. Introduction:

Income is the metric by which society measures the economic wellbeing of individuals, families and households. Moreover, the distribution of household income continues to be the subject of much public policy and debate, with most of the discussion focusing on the direction, magnitude, and the reasons for changes over time. Prior to the most recent recession, trends in household income suggested the income gap was widening, with those households in the top 20 percent of the income distribution accounting for close to half of all income (Hisnanick and Giefer, 2011). The recession that began at the end of 2007 was both the longest and the worst since the great depression more than 75 years ago, impacting the lives and livelihoods of most U.S. households. Over the two-year span of 2008-2009, an estimated 8.7 million jobs were lost, the national unemployment rate more than doubled to just over ten percent, and real growth in gross domestic product (GDP) was negative in five-out-of-eight quarters (U.S. Department of Commerce, Bureau of Economic Analysis). While such numbers are troubling, the recession's impact varied among states and regions.

A fundamental assumption of (macro) economic theory is that robust job growth is a significant factor in sustaining economic growth, which leads to growth in per capita income, and ultimately to rising levels of (real) personal, family and household income. Connaughton and Madsen (2012) argued that the 2007-2009 recession was so severe that the overall gain in jobs for the 50 states, which totaled just over 5.1 million, between December 2000 and December 2007, was completely offset by the job losses during the recession. More specifically, during the recession one-third (2.9 million) of the jobs lost occurred in the states of California, Michigan, Ohio, Illinois, and New York. However, Alaska and North Dakota experienced a modest growth in jobs over this time. In order to gain some added perspective on the severity of this recent recession, Weller and Logan (2009) estimated that between September 2007 and September 2008 U.S. households lost an estimated $9.9 trillion in total real wealth, resulting from the sharp declines in both the housing and financial markets. Moreover, during this time the income gap between those households in the top one-percent of the income distribution and those in the bottom quintile tripled (Sherman and Stone, 2010).

The 2007-09 economic contraction affected most, if not all, local, state, and regional economies across the U.S., leaving those households in the bottom and middle of the income distribution in a weaker position to handle such unexpected events as the extended periods of unemployment experienced by many. One region of the U.S., the Appalachia region, has continued to lag behind the rest of the country, even during times of robust economic growth and overall prosperity. Even before the great recession, an estimated 400,000 manufacturing jobs were lost between 2000 and 2007 in the Appalachia region. While the nation fell back to 2004 employment levels during this most recent contraction, for the Appalachia region the recession took the region back to 2000 employment levels. Of the 420 counties in Appalachia, only 35 registered positive employment growth during the recession, which hit the region sooner and harder than many other parts of the country.

This paper focuses on household income before, during and after the great recession, comparing and contrasting it, across the region as well as with the U.S. Moreover, the paper uses several standard measures of income inequality for the Appalachia region, again comparing these across the region and the rest of the county. The paper proceeds in the following manner. The next section will provide a review of the most relevant literature looking at U.S. income inequality, as well as the relevant literature looking at household income inequality in the Appalachia region. Section 3 focuses on the data and methodology used in this paper by way of a discussion of the trends in the U.S. and Appalachia region household income distribution and section 4 discusses the income inequality findings based upon household income data for the Appalachian region and the U.S. The last section, Section 5, compares and contrasts income inequality in the Appalachia region for 2006, 2008 and 2010, as well as providing some concluding remarks on this research and its future direction.

2. Literature Review

U.S. Income Inequality:

The U.S. prides itself on the mobility that individuals, families and households achieved through the opportunities afforded from a robust economy. Historically, robust economic growth and income mobility are viewed as an antidote to poverty and they provide an incentive for individuals to work and improve their economic position, as well as providing an answer to those who worried that the income disparity between those in the bottom and top of the income distribution was too large. For example, using data from the 1980 U.S. Census and annual income data collected in the Current Population Survey, Levy (1987) argued that a robust, growing economy resulted in a steady increase in median family income during the U.S. postwar period of 1947 to 1973.

During this period, new records were set every one to three years for median family income and such steady income growth was assumed to be a given. In 1947, median family income stood at $14,100 (in 1984 dollars) by 1959 it increased 37 percent to $19,300. Similarly, by 1973 median family income increased to $28,200, or 46 percent. During the postwar period income inequality remained roughly constant because the whole income distribution kept moving to higher levels as most individuals and families improved their situation. By 1975, however, the phenomena of continued income growth ended and median family income declined, but briefly bounced back to pre-1975 levels by the end of 1979. Median family income fell sharply during the 1980-82 recession and remained relatively constant or flat throughout the remainder of the decade.

This abrupt break in twenty-six years of income growth, followed by twelve years of income stagnation, has been a major research interest for this postwar period. Arguments that were presented to explain the decline in income experienced in the 1980s focused on demographic and institutional changes, as well as macroeconomic factors and changes in public policy that were occurring in the economy during that time (Pressman, 2007). For those households in the bottom and middle of the income distribution, it has been proposed that the principal cause of the decline in income was structural in nature. That is, a reduction in both the economy's industrial and manufacturing base and the number of jobs in these sectors, as well as the associated decline in unionization (Thurow, 1984; Bluestone and Harrison, 1988).

The decade of the 1980s saw a shift to high technology and service jobs that tended to pay either very high or very low wages, replacing the well-paying jobs in basic manufacturing, long the mainstay of those households in the lower and middle portion of the income distribution. From a demographic perspective, others argued that the entry of the baby-boom cohort into the labor market, the rising number of two-income families and college graduates, as well as rising divorce rates and the associated growing number of single-parent families, resulted in a decline in the number of households in the middle income group (Lawrence, 1984; Beach, 1989, and Levy, 1987). Retrospectively, many differing arguments and opinions were offered to explain the declining or stagnating incomes of many households in the 1980s. However, none supported or anticipated the reversal that occurred in the following decade.

The 1990s was a decade when the U.S. economy experienced, on average, greater growth, lower unemployment, and lower inflation than other major industrial nations.[2] Gross Domestic Product (in real terms) increased 32 percent, unemployment dropped below 5 percent and inflation averaged around 4 percent annually. In addition, Federal deficit spending turned into a budget surplus.[3] Compared to the previous decade, a plentiful supply of jobs and rising real wages seemed to make, once again, a comfortable lifestyle accessible to more U.S. households, and concerns of declining and stagnating incomes from the previous decade quickly faded.

Between 1990 and1994, the noted prosperity of this decade was not equally shared among all households. The mean income of households in the middle of the income distribution declined, on average, at an annual rate of 0.82 percent, while the mean household income of those in the top increased 2.8 percent. From 1995 to 1999, however, the effect of the decade's prosperity was reflected among all households' income. During this latter five-year period, the household income of those in the middle of the income distribution experienced an annual average increase of 2.5 percent, households in the top experienced an annual average increase of 2.8 percent, even those households in the bottom quintile experienced an average annual increase of 3.0 percent (DeNavas-Walt, et al., 2008). Moreover, the income shares of households in the middle and top of the income distribution remained stable (Hisnanick and Walker, 2011).

At the start of the twenty-first century, the economy showed signs of slowing down relative to the robust economic growth and income advances that occurred in the previous

[2] Referred to as the "fabulous decade" by Blinder and Yellen, 2001.

[3] Author's calculations based upon data from U.S. Council of Economic Advisors. Economic Report of the President: 2009. Appendix B, Tables 2, 42, and 60.

decade. Households found themselves facing a recession, followed by a recovery that resulted in moderate economic growth, but minimal growth in median household income. For example, between 2000 and 2004, the mean income of households in the middle of the income distribution experienced an annual average decline of 0.8 percent. Similarly, for this period, the mean income for households in the top and bottom of the income distribution experienced average annual declines of 0.2 percent and 1.8 percent, respectively. In comparison, between 2005 and 2007 the mean household income for those in the middle, top, and bottom of the income distribution experienced, on average, annual increases of only 0.8 percent, 0.4 percent, and 0.9 percent, respectively (DeNavas-Walt, et al., 2008).

Starting in the last quarter of 2007, the U.S. economy entered into a recession that impacted the incomes of all households across the income distribution, but the largest impact was felt by those in the lower and middle portion of the distribution. Between September 2007 and September 2008, U.S. households lost $9.9 trillion in total real wealth, following sharp declines in both the housing and financial markets (Weller and Logan, 2009). Moreover, during this time the income gap between households in the top one-percent of the income distribution and those in the bottom fifth tripled (Sherman and Stone, 2010). Clearly, this loss of wealth resulted in households in the bottom and middle of the income distribution being in a weaker position to handle unexpected events, such as a sudden job loss and extended periods of unemployment. The discussion presented in the literature, in conjunction with available data, suggests that, over the last four decades income growth has become more polarized among U.S. households. In the next section, the focus will be on the Appalachian region and the issues of income and earnings inequality.

<u>Appalachian Income Inequality:</u>

Appalachia is a region in the eastern United States that stretches from the southern tier of the state of New York to northern Alabama, Mississippi, and Georgia (see Figure 1). Appalachia is usually considered a cultural region referring to the area around the central and southern portions of the Appalachian Mountain range. Since Appalachia lacks definite topographical boundaries, there has been some disagreement over what exactly the region encompasses. The most commonly used modern definition is the one provided by the Appalachian Regional Commission (ARC) in 1965 and expanded over subsequent decades. The region currently includes 420 counties and eight independent cities in 13 states, including all of West Virginia, 14 counties in New York, 52 in Pennsylvania, 32 in Ohio, 3 in Maryland, 54 in Kentucky, 25 counties in Virginia, 29 in North Carolina, 52 in Tennessee, 6 in South Carolina, 37 in Georgia, 37 in Alabama, and 24 in Mississippi. When the ARC was established, counties were included in the region based on economic need, rather than any cultural parameters (Appalachia Regional Commission, 2008). According to the 2010 census, the region was home to approximately 25 million people. While it is endowed with abundant natural resources, it has historically been associated with poverty and the struggles associated with it. In fact, Black and Sanders (2004) found that between 1970 and 2000, for the Appalachian region, median family income remained substantially below the U.S. median, poverty rates were higher, and labor force participation was lower than that experienced by the U.S.

In the early 20th century, large-scale logging and coal mining firms brought wage-paying jobs and modern amenities to Appalachia, but by the 1960s the region had failed to capitalize on any long-term benefits from these industries (Sokol, 2013). In the 1960s, per capita market income in the region was $1,267, or 77 percent of the U.S. amount and nearly one-third (31.1

percent) of the region's residents live in poverty compared to just over one-fifth (22.1 percent) for the rest of the U.S. (Wood and Bischak, 2000).

The economy of Appalachia traditionally rested on agriculture, mining, timber, and in the cities, manufacturing. More recently, the region has been promoting tourism and second home development. Coal mining is the industry most frequently associated with the region in outsiders' minds, due in part to the fact that Appalachia once produced two-thirds of the nation's coal (National Mining Association, 2007). At present, however, the mining industry employs just two percent, just under 50,000 people, in at the region at the beginning of the 21st century. Most mining activity has been concentrated in eastern Kentucky, southwestern Virginia, West Virginia, and western Pennsylvania, with smaller operations in western Maryland, Tennessee and Alabama. About two-thirds of Appalachia's coal is produced by underground mining, and the rest by surface mining techniques (National Mining Association, 2007). The mining industry is vulnerable to economic downturns, and booms and busts are frequent, with major booms occurring during World War I and II, and the worst bust occurring during the Great Depression.

Poverty has plagued Appalachia for many years. In the 1930s, the federal government sought to alleviate poverty in the region with a series of New Deal initiatives, such as the construction of dams to provide cheap electricity and the implementation of better farming practices. However, the region's economic situation was not brought to the attention of the rest of the United States until Agee and Evans (1940) published "Let Us Now Praise Famous Men," a book that documented families in Appalachia during the Great Depression. Similarly, Harrington's (1962) "The Other America," which addressed poverty amid plenty in many part of the U.S. focused much attention on Appalachia. Harrington noted, over five decades ago, that Appalachian poverty is unusual in ways that challenge many deeply held beliefs about poverty in this country. More specifically, poverty in the region did not seem to result from discrimination based on minority status, emanate from recent immigration and the ability to assimilate into American culture, or a rejection of tradition American norms and values (Sarnoff, 2003). Two attributes that Harrington observed that made Appalachian poverty both unusual and intractable were: (1) that the long-term, unmitigated poverty typical of Appalachia, which persists in times that are economically beneficial for most Americans, is particularly demoralizing because it destroys aspirations; and (2) that people raised in Appalachia were viewed as unfit for urban life, because it was assumed that their acculturation, values, education and training failed to prepare them to adapt to a rapidly changing, highly technological, urban America. Harrington's book helped spawn and support the launch President Lyndon Johnson's War on Poverty in 1964.

One year after the launch of the War on Poverty, Congress passed the Regional Development of 1965 (ARDA). The ARDA resulted in designating Appalachia as a special economic zone and created the Appalachian Regional Commission (ARC), a federal and state partnership with the mission to alleviate poverty in the region, mainly through diversifying the region's economy and helping to provide better health care and educational opportunities to the region's inhabitants (Zilak, 2012).

Because of the isolation of the region, people of the Appalachian region were unable to catch up to the modernization that the rest of the country was experiencing at that time. In the 1960s, many people in Appalachia had a standard of living comparable to third world countries. Nearly one-third (31.1 percent) of the region's residents lived in poverty, compared to just over one-fifth (22.1 percent) for the rest of the U.S. The level and degree of poverty in Appalachia, at that time, was related to the fact that per capita market income in the region was $1,267, or 77 percent of the U.S. average (Wood and Bischak, 2000).[4] Moreover, county poverty rates in the region were, on average, 10 percentage points higher than the rest of the country, and part of the reason has been associated with the fact that high school graduation rates were around 25 percent, about 11 percentage points lower than the rest of the U.S. In the central Appalachian region (see Figure 2), those counties in the states of Kentucky, Tennessee, Virginia and West Virginia experienced poverty rates nearly double those experienced by counties outside the region. More specifically, in the 1960's West Virginia, which is the only state completely in the Appalachian region, half of the population lived in poverty, many suffered from malnutrition and the majority lacked basic amenities such as indoor plumbing (Zilak, 2012).

By 1970, the poverty rate for the Appalachian region was down to 17.8 percent of the population, but still above the overall U.S. rate, which was 13.7 percent. Much of the success in the reduction of poverty among the people of Appalachia can be attributed to the coal boom (and oil shortage) that the U.S. was experiencing. At the start of the decade, the region's male unemployment rate stood at 4.8 percent compared the national unemployment rate of 4.4 percent. Moreover, the labor force participation rates for both men and women were comparable to those for the entire U.S.: 69 percent for men and 35 percent for women in the region compared to 70 percent for men and 37 percent for women in the entire U.S. (Black and Sanders, 2004).

Between 1970 and 1980, there was a substantial drop in the level of family income inequality in the Appalachian region compared to the overall drop experienced by the rest of the U.S. during that time.[5] The 1980s was also a time when the U.S. economy was entering into a

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[4] This figure is in 1960 dollars.

[5] Comparing at the 90th to 10th percentile family income for the Appalachian region and the U.S., the Appalachian region saw this ratio drop from 8.19 in 1970 to 7.57 in 1980. For the U.S. overall, the ratio dropped from 8.25 in 1970 to 7.92 in 1980.

two-year recession. In 1980, the poverty rate for the region was 14.0 percent compared to 12.4 percent for the U.S. and the region's male unemployment rate stood at 8.8 percent compared to the 7.6 percent rate experienced by the U.S. During this time the labor force participation rates for both men and women were comparable to those for the entire U.S. Starting in the 1980s, innovations in mining, such as longwall mining techniques, and competition from oil and natural gas resulted in a decline in the region's mining operations. In addition, environmental restrictions placed on high-sulfur coal in the 1980s, brought further mine closures in the region (Abrasome, 2006).

By 1990, Appalachia had largely joined the economic mainstream, but still lagged behind the rest of the nation in most economic indicators (Abramson, 2006). The region's poverty rate was 15.3 percent, nearly two percent point higher than the national rate and the region's male unemployment rate was at 8 percent, comparable to the national rate of 7.5 percent. Appalachia was much more economically distressed than the U.S., with the central area of Appalachia, which includes West Virginia and eastern Kentucky, had particularly high levels of economic distress. For example, in 1990 14.3 percent of counties in the U.S. met the criteria to be classified as 'distressed', while in Appalachia 28.3 percent of the counties were classified as such (Black and Sanders, 2004). [6]

At the start of the 21st century, the Appalachian region contained approximately 8 percent (22.9 million people) of the total U.S. population, with the greatest number of residents (5.8

[6] Economic distress is a management tool developed by the ARC to assist in categorizing counties in four possible states: distressed; transitional; competitive; and attainment. In order to classified as 'distressed' a county must have (1) a three-year average unemployment rate that is 150% or more of the U.S. average, (2) per capita market income at 67% or less of the U.S. average, and (3) a poverty rate that is 150% or more of the U.S. average.

million) in the region living in Pennsylvania (Pollard, 2003).[7] Between 1990 and 2000, the Appalachian region experienced 9 percent growth in population while the rest of the U.S. experienced a growth rate of 14 percent. Appalachia's population growth, over this period, was not uniform. The southern portion of the region grew at 18 percent, twice the overall rate for the region. By contrast, growth was slower in much of Appalachia's northern and central portions. Central Appalachia grew at slightly less than 6 percent and Northern Appalachia barely grew at all. As one would expect, population growth in the metropolitan counties was slightly faster than the non-metropolitan counties (9.5 percent compared to 8.6 percent). However, in the Northern portion, just the opposite was observed. Between 1990 and 2000, non-metropolitan counties experienced a 4 percent growth in population, while the metropolitan counties experienced only a 0.4 percent growth in population.

In regards to economic characteristics and the Appalachian region, at the beginning of the 21st century, the region's residents experienced a higher poverty rate and lower incomes than residents in the rest of the country, but comparable unemployment rates. In 2000, the poverty rate for the region (13.6 percent) declined nearly two percentage points from 1990, however the rate was still higher than the national rate, which was 12.6 percent at that time. Per capita income in the region stood at $18,200, which was around 84 percent of the U.S. per capita income ($21,600). Unemployment in the region was 5.8 percent compared to 5.7 for the entire U.S in 2000. The unemployment rate, however, was not uniform across the region. In the southern portion of the region, the unemployment rate was 5.0 percent, in the northern portion the unemployment rate was 6.2 percent, and for the central portion the rate was at 7.5 percent (Pollard 2003).

[7] 52 counties in Pennsylvania are in the northern portion of the Appalachian region.

While there have been improvements in the Appalachian region since the launching of the war on poverty over fifty years ago, many problems are still challenging the region and the residents remain much poorer than the typical U.S. resident. More specifically, poverty, and unemployment are higher and labor force participation rates are lower than overall U.S. rates, and median family income and earnings in the region remain below the median U.S. estimate. In the next section, the data and methods used to investigate the issue of income inequality in the Appalachian region before, during, and after the worst recession the U.S. economy has experienced since the 1930s are discussed.

3. Data and Methods

Data:

The data for this paper are from the 2006, 2008 and 2010 American Community Survey (ACS), which covers that time before, during, and after the recent economic downturn. [8] The ACS is the largest survey in the United States, with an annual sample size of about 3 million addresses across the U.S. and Puerto Rico, and is conducted in every county in the nation, as well as the municipalities of Puerto Rico. The ACS collects detailed social, economic, housing, and demographic information previously collected by the decennial census long form, but it provides up-to-date information every year rather than once a decade on the non-institutional population.[9]

[8] According to the National Bureau of Economic Research (NBER) the most recent recession began in December 2007 and ended in June 2009. This choice of calendar years captures the time before, during and after the recession.

[9] For information on the ACS sample design and other ACS topics, visit <www.census.gov/acs/methodology/>.

The ACS household income data represents money income received by all members of the household before deductions for such things as personal income taxes, union dues, Social Security and Medicare, does not include the value of noncash benefits and excludes certain money receipts, such as capital gains.[10] The data was collected between January and December of the respective year, with the reference period being the prior twelve months. For example, people 15 years and older were asked about earnings from all jobs, as well as earnings from self-employment, for the previous 12-month period resulting in a total time span covering 23 months. Data collected in January 2007 had a reference period from January 2006 to December 2006. All income and earnings data collected in the ACS are inflation-adjusted to reflect the dollar value of the respective calendar year. That is, the 12 different reference periods are adjusted to reflect a fixed reference period using the Consumer Price Index.

Methods:

The following discussion will focus on several common measures of inequality using household income data from the American Community Survey (ACS) for the years 2006, 2008 and 2010. Comparison will be made between the U.S. estimates and those for the Appalachian region as a whole, then among the respective sub-regions. The comparisons will involve estimated median household income values as well as the U.S household income distribution and the respective income shares. As was mention earlier, the Appalachian region is rather heterogeneous with respect to topography, demographics and economics. For research purposes, and greater analytical detail, the region is decomposed into five relatively homogeneous sub-regions: the North; North Central; Central; South Central; and Southern (see Figure 2).

[10] Noncash benefits includes such things as the value of Supplemental Nutrition Assistance Program benefits (formerly known as food stamps), health benefits, subsidized housing, payments by employers for retirement programs, medical and educational benefits and goods produced and consumed on the farm.

4: Findings

Household Income:

In the year prior to the onset of the most recent recession, 2006, median annual U.S. household income was $51,780, and for the Appalachian region, annual median household income was 81 percent ($42,050) of the U.S. annual median estimate. Among the five Appalachian subregions, median annual household income ranged from 61 percent ($31,781) of the median annual U.S. household income in the Central subregion to 81 percent ($45,402) of the median annual U.S. household income in the Southern subregion (see Table 1). By 2008, the first full year of the recession, the median annual U.S. household income stood at $51,536 and for the Appalachian region, median annual household income was, once again, 81 percent ($42,343) of the median annual U.S. household income.[11] Among the Appalachian subregions, median annual household income ranged from 61 percent ($31,362) for the Central subregion, to 89 percent ($45,925) for the Southern subregion for median annual U.S. household income.

In 2010, the impact of the recession was definitely captured in the values of median annual household income for both the U.S. and the Appalachian region. For the Appalachian region, in 2010 annual median household income remained at 81 percent of the U.S. annual median estimate. However, between 2006 and 2010, median annual U.S. household income declined $2,080, from $51,780 to $49,700. Similarly, over this time the median annual household income in the Appalachian region declined $1,550, from $42,050 to $40,500. Looking at the Appalachian subregions, for three of the five subregions, the changes in median annual household income were not statistically significant, however, for the South Central and

[11] Between 2006 and 2008, the change in annual median household income was not statistically significant for both the U.S. estimate and the Appalachian region estimate.

Southern subregions, the declines in median annual household income were $2,146 and $2,402, respectively.

Household Earnings:

In 2006, median annual U.S. household earnings in the U.S. stood at $41,600, 80 percent of the median annual U.S. household income. By contrast, for the Appalachian region median annual household earnings were $31,372, 75 percent of median annual household income for the region, and 75 percent of the U.S. median annual earnings. Among the five subregions, median annual earnings ranged from $19,426 in the Central subregion (46 percent of the median annual U.S. household earnings) to $36,712 in the Southern subregion (88 percent of the median annual U.S. household earnings). By 2008, median annual U.S. household earnings declined $201 from 2006, ($41,600 to $41,399). In the Appalachian region, median annual earnings declined $231 from 2006 ($31,372 to $31,141). For the five subregions, the changes in median annual household earnings were not statistically significant (see Table 1).

As was observed for median annual household income, between 2006 and 2010, similar trends are observed regarding median annual household earnings. By 2010, median annual U.S. household earnings declined $4,483 from 2006 estimates and for the Appalachian region median annual earnings declined by $4,086 from 2006 estimates. For the Appalachian subregions, between 2006 and 2010, they all experienced a decline in median annual household earnings, ranging from $2,993 for the North Central subregion to $5,085 for the Southern subregion. It is worth noting that the Appalachian Central subregion experienced a decline in median annual earnings of $4,239 between 2006 and 2010, resulting in median annual earnings of $15,187, 41 percent of the median annual U.S. household earnings estimate of 2010 ($37,117).

Historically, the Appalachian region has lagged behind the rest of the country in regards to income and earnings (Zilak, 2012; Black and Sanders, 2004; Pollard, 2003). It should come as no surprise that in the years just before, during and after the most recent recession, the region experienced declines in both median annual household income and earnings. However, what is notable is that, between 2006 and 2010, the declines in median annual household earnings were substantially greater than one would expect, relative to the estimates of median annual household income. For example, in 2006, median annual household earnings ($31,372) were 75 percent of the estimated median annual household income. By 2010, this proportion dropped to 67 percent. For the Central subregion of Appalachia in 2006, the proportion of annual median household earnings to annual median household income was 47 percent, by 2010 the proportion dropped to 41 percent. In the next section, a more detailed comparison is made among the household income distribution for the Appalachian region, and its five subregions, relative to the U.S. household income distribution.

Household Income Distribution:

When looking at household income in the Appalachian region relative to the U.S. household income distribution, differences become more striking. In 2006, 48.9 percent of households in the region had an annual income that placed them in either the bottom or 2nd quintile of the U.S. household income distribution (see table 4). By contrast, 30.5 percent of households in the region had incomes that placed them in either the 4th or top quintiles of the U.S. household income distribution. In 2008, the percentage of Appalachian households with incomes that placed them in either the bottom or 2nd quintile of the U.S. household income distribution declined to 47.8 percent and the proportion of Appalachian households in either the 4th or top quintile remained comparable to the 2006 estimates. By 2010, the proportion of

Appalachian households in either the bottom or 2^{nd} quintile remained at 47.8 percent, however, the proportion of households in either the 4^{th} and top quintile of the U.S. household income distribution increased to 31.3 percent.

When looking at the subregions of Appalachia, in 2006, 2008 and 2010, all had a higher than expected proportion of households in the bottom quintile and a much lower than expected proportion of households in top quintile of the U.S. income distribution. In 2006, one-fourth (25.3 percent) of Appalachian households had an annual income placing them in the bottom quintile of the U.S. household income distribution. Among the subregions, the proportion of households in the bottom quintile ranged from 23.0 percent in the Southern subregion to 35.7 percent in the Central subregion. By contrast, in 2006, 12.6 percent of households in the region had an annual income placing them in the top income quintile of the U.S. household income distribution. Among the five subregions, the proportion of households in the top quintile ranged from 7.5 percent of households in the Central subregion to 15.6 percent of household in the Southern region. By 2010, similar proportions were observed within the Appalachian region and among its subregions. Nearly one-fourth (24.8 percent) of households in the region had an annual income that placed them in the bottom quintile and for the subregions, the proportion of households in the bottom quintile ranged from 22.8 percent in the Northern subregion to 33.6 percent in the Central subregion. For the top quintile, 12.9 percent of households had an annual income that placed them in there. For the subregions, 8.1 percent of households in the Central subregion and 15.3 percent of households in the Southern subregion had an annual income that placed them in the top quintile of the U.S. income distribution.

Size Distribution of Income:

In 2006, the aggregate value of U.S. household income was $7.78 trillion, with the income shares of the respective quintiles being: 3.7 percent for the bottom quintile; 9.4 percent for the 2nd quintile; 15.3 percent for the middle quintile; 23.1 percent for the 4th quintile; and 48.4 percent for the top quintile. By 2008, the aggregate value U.S. household income increased 3.1 percent ($243.2 billion) to $8.03 trillion, with only the top quintile experiencing an increase in their income share, from 48.4 percent to 48.9 percent. When looking at how the $243.2 billion increase between 2006 and 2008 was distributed among the quintiles, 63.8 percent ($155.2 billion) was accounted for by households in the top quintile, 17.6 percent ($42.9 billion) was accounted for by households in the 4th quintile, 9.7 percent ($23.7 billion) was accounted for by households in the middle quintile, 6.3 percent ($15.3 billion) was accounted for households in the 2nd quintile, and 2.5 percent ($5.9 billion) was accounted for by households in the bottom quintile. While all quintiles shared in this increase in aggregate income between 2006 and 2008, the major beneficiaries were those households in top quintile of the income distribution.

Between 2008 and 2010, the aggregate value of U.S. household income declined 3.3 percent ($266.8 billion) to $7.76 trillion. The income shares among the quintiles remained comparable to 2008 estimates, the overall decline was not equally shared among the households in the respective quintiles. For example, between 2006 and 2008, households in the bottom and 2nd quintile experienced an increase in their aggregate income of $5.9 billion and $15.4 billion, respectively. Between 2008 and 2010, the aggregate value of income for households in these two quintiles declined more than two-fold. The aggregate value of income declined $12.2 billion for households in the bottom quintile and for households in the 2nd quintile the aggregate value of income declined $37.7 billion. A similar trend was observed for the aggregate value of income for households in the middle quintile. Between 2006 and 2008, the aggregate value of their income increased $23.7 billion, however, between 2008 and 2010 it declined by $37.1 billion. Clearly, all the early gains observed between 2006 and 2008 were eliminated.

Those households in the 4th and top quintile, however, did not experience the magnitude of declines in aggregate income between 2008 and 2010 that canceled out the earlier gains experienced between 2006 and 2008 for households in the bottom, 2nd and middle quintiles. The aggregate value of income for households in the 4th and top quintile increased $42.9 billion and $155.2 billion, respectively between 2006 and 2008. Between 2008 and 2010, households in these quintiles experienced declines in their aggregate value of $40.9 billion and $139.0 billion. While the absolute dollar amounts of the declines are substantial, the magnitude of the declines are considerably less than those experienced by households in the lower end of the U.S. household income distribution. The past recession clearly impacted the incomes of all U.S. households but given the magnitude of the declines in aggregate household income, the burden of the recession fell on the incomes of the households in the lower end of the U.S. income distribution.[12]

The Appalachian region:

So, what was the impact on the size distribution of income for those households in the Appalachian region and its respective five subregions? In 2006, the value of Appalachian

[12] Based upon author's calculations which are available upon request.

aggregate household income stood at $531.2 billion, reflecting 6.8 percent of the value of U.S. aggregate household income. In 2008, the value of aggregate household income for the region increased 2.6 percent ($14.0 billion) to $545.2 billion, still reflecting 6.8 percent of the value of U.S. aggregate household income. By 2010, the value of aggregate household income in the region was $532.5 billion, a decline of 2.3 percent ($12.7 billion) from the region's 2008 value of aggregate household income.

Turning to the size distribution of income for the Appalachian region, because household incomes were lower in the region, there is a larger proportion of households that fall into the lower end of the U.S. income distribution, resulting in different income shares for households in the region, relative to that observed for U.S. households. For example, in 2006 Appalachian households with incomes that placed them in the bottom quintile of the U.S. income distribution accounted for 5.7 percent ($30.8 billion) of the total value of Appalachian household income, while for the U.S., households in the bottom quintile accounted for 3.7 percent of aggregate household income in 2006. On the other end of the income distribution, those Appalachian households with annual incomes that placed them in the top quintile of the U.S. income distribution, accounted for 34.9 percent ($185.5 billion) of the aggregate value of Appalachian household income, while for the U.S., households in the top quintile accounted for 48.4 percent of the value of aggregate household income.[13] For those Appalachian households with annual incomes that placed them in the 2nd, middle and 4th quintiles of the U.S. income distribution, their income shares for the value of Appalachian household income were 13.8 percent, 20.2 percent, and 25.4 percent, income shares that were above those observed for U.S. household income distribution, which were 9.4 percent, 15.3 percent, and 23.1 percent, respectively.

[13] Based upon author's calculations and are available upon request.

In 2008, all but those Appalachian households with incomes that placed them in the top income quintile had comparable income shares to the 2006 estimates. Between 2006 and 2008, the income share of households in the top quintile increased from 34.9 percent to 35.2 percent, accounting for $6.2 billion (44 percent) of the $14.0 billion increase in the value of aggregate Appalachian household income. By contrast, between 2008 and 2010, income shares for households in the bottom, 2nd and middle quintile declined, while the income shares for households in the 4th and top quintile increased. Recalling that during this time the value of aggregate Appalachian household income declined $12.7 billion with most of the decline (93 percent) experienced by those households with incomes that placed them in the bottom, 2nd and middle quintiles. Appalachian households, in these respective quintiles, saw all the increases experienced between 2006 and 2008 disappear and substantially more. More specifically, Appalachian households in the bottom quintile not only saw the $376.2 million increase between 2006 and 2008 disappear, but they also experienced an additional decline of $1.9 billion in aggregate annual income between 2008 and 2010. Even more troubling is the aggregate income declines experienced by Appalachian households in the 2nd and middle quintiles. Households in the 2nd quintile experienced a $1.8 billion increase in aggregate income between 2006 and 2008. Between 2008 and 2010, this increase also disappeared as well as an additional $4.5 billion, resulting in a total decline in aggregate household income of $6.3 billion for these households. Similarly, households in the middle quintile experienced an increase of $1.96 billion between 2006 and 2008, but between 2008 and 2010, these households experienced an aggregate decline of $3.3 billion, $1.3 billion more than the earlier increase.

Appalachian households in the 4th and top quintiles, however, experienced increases in their income shares between 2008 and 2010. For households in the 4th quintile, between 2006 and 2008, the aggregate value of household income increased $3.7 billion. Between 2008 and 2010, households in this quintile experienced a decline in the total value of income by $1.6 billion. This decline was offset by the earlier increase but did not completely eliminate it, resulting in an increase in income share from 25.4 percent to 25.7 percent. Between 2006 and 2008, households in the top quintile experienced a $6.1 trillion increase in the value of aggregate household income. Between 2008 and 2010, households in this quintile did not experience a decline in the value of aggregate household income. Rather, Appalachian households in the top quintile experienced an increase in their income share, from 35.2 percent to 36.1 percent, which translates into an increase in $753.5 million in aggregate household income.

5: Discussion

Focusing on median household income, between 2006 and 2010, the decline observed for the U.S. (4.2 percent) was proportionally larger than decline experienced by the Appalachian region (3.8 percent). However, annual household income for the region continued to lag behind that of the U.S., anywhere from 11 to 39 percentage points across the region. On the other hand, when looking at median earnings between 2006 and 2010, households in the Appalachian region experienced a 13.0 percent decline ($4,086) in annual earnings, while households the U.S. experienced a 10.8 percent decline ($4,483) in median annual earnings. In absolute terms, the decline in median annual earnings by households in the Appalachian region was less than the decline experienced by U.S. households. However, for the region, median annual household old earnings stood at 75.4 percent of the median for all U.S. households, so a smaller denominator resulted in a larger proportional decline for households in the region. Because the region's median household income and earnings lag behind the rest of U.S. during prosperous times, during a recession the impact on Appalachian households is much more pronounced. For example, in the Appalachian Central subregion, between 2006 and 2010, median household earnings declined to the level of being just 41 percent of the U.S. median household earnings, or estimated median monthly household earnings of $1,266.

When looking at Appalachian household income, relative to the U.S. household income distribution, several notable outcomes were observed. A larger than expected proportion (48.9 percent) of Appalachian households had an annual income that placed them in either the bottom or 2nd quintile and a smaller than expected proportion (31.3 percent) of household had annual incomes that placed them in either the 4th or top quintile of the U.S. household income distribution. For the Appalachian subregions, the proportion of households compared to in the U.S. household income distribution varied greatly. For example, for the Central subregion, for the three years investigated, one-third of households had an annual income that placed them in the bottom quintile, less than ten percent of households had an annual income that placed them in top quintile and around one-fifth of households had an annual income that placed them in the middle quintile of the U.S. household income distribution. On the other hand, three-fifths of households in the Southern subregion had an annual income that placed one-fifth of them into either the bottom, 2nd or middle quintile, a result comparable to what is found in the U.S. household income distribution.

Because there is a disproportionate number of households with an annual income that place them in the lower quintiles of the U.S. household income distribution, there is less inequality across the region relative to what is found in the U.S. overall. For the years involved, Appalachian households in the bottom quintile accounted for about 5.6 percent of the aggregate value of household income for the region. By comparison, households in the bottom quintile account for 3.6 percent of total U.S. household income. On the other end of the income distribution, those Appalachian households with incomes that placed them in the top quintile of the U.S. household income distribution accounted for 35.4 percent of annual aggregate Appalachian income, whereas for the U.S. overall, households in the top quintile accounted for 48.7 percent of annual aggregate U.S. household income. For Appalachian households with annual incomes that placed them in the 2nd, middle and 4th quintile of the U.S. household income distribution, they accounted for 13.5 percent, 20.0 percent and 25.5 percent of the annual value of Appalachian household income. Whereas for the U.S. overall, households in these quintiles accounted for 9.3 percent, 15.2 percent and 23.1 percent of the annual value of U.S. household income.

While it appears that there is less inequality among households in the Appalachian region, between 2006 and 2010 the overall decline in income was not equally share amount all the households. For example, the value of aggregate Appalachian household income from 2008 to 2010 declined $12.7 billion with most of the decline (93 percent) experienced by those households with incomes in the bottom, 2nd and middle quintiles. Households, in these respective quintiles, saw all the increases experienced between 2006 and 2008 disappear and substantially more. By contrast, between 2008 and 2010, households in the top quintile did not experience a decline in the value of aggregate household income rather these households experienced an increase in their income share, from 35.2 percent to 36.1 percent, which translates into an increase in $753.5 million in annual aggregate household income.

The previous discussion and data provides the foundation for ongoing research into the impact of the most recent economic contraction, as well as the ongoing recovery, for the Appalachian region. Many of the issues facing this region, while reflected in annual income amounts, does not explain the underlying cause of this measurable outcome. Future work will focus on uncovering those quantifiable factors that account for these lower values.

Table 1: Median income and earnings, U.S. and Appalachia: 2006, 2008 and 2010

2006

	Number of households	M.o.E.	Median household income	M.o.E.	Median household earnings	M.o.E.
US Total	**111,617,402**	**145,579**	**$51,780**	**$177**	**$41,600**	**$97**
Appalachian Region	**9,597,682**	**27,959**	**$42,050**	**$322**	**$31,372**	**$340**
Northern	3,344,505	9,991	$43,240	$144	$31,706	$556
North Central	933,039	5,938	$38,916	$617	$27,202	$507
Central	739,666	6,503	$31,781	$1,021	$19,426	$1,331
South Central	1,799,242	10,433	$40,646	$679	$29,149	$603
Southern	2,781,230	13,926	$45,402	$180	$36,712	$476

2008

	Number of households	M.o.E.	Median household income	M.o.E.	Median household earnings	M.o.E.
US Total	**113,097,835**	**148,339**	**$51,536**	**$175**	**$41,399**	**$192**
Appalachian Region	**9,714,990**	**33,515**	**$42,343**	**$343**	**$31,141**	**$176**
Northern	3,349,178	14,762	$43,559	$140	$31,447	$252
North Central	940,805	7,411	$40,216	$905	$27,165	$1,251
Central	744,841	6,820	$31,362	$783	$18,252	$1,005
South Central	1,832,837	12,028	$40,520	$17	$29,351	$590
Southern	2,847,329	15,491	$45,925	$688	$36,688	$447

2010

	Number of households	M.o.E.	Median household income	M.o.E.	Median household earnings	M.o.E.
US Total	**114,567,419**	**165,785**	**$49,700**	**$174**	**$37,117**	**$68**
Appalachian Region	**9,761,873**	**31,022**	**$40,500**	**$276**	**$27,286**	**$270**
Northern	3,341,850	14,962	$42,700	$551	$28,400	$671
North Central	945,226	7,973	$39,132	$924	$24,209	$820
Central	735,270	8,162	$31,198	$774	$15,187	$1,009
South Central	1,870,547	12,963	$38,500	$638	$25,055	$303
Southern	2,868,980	14,345	$43,000	$437	$31,627	$785

Note: All dollar values are adjusted to 2010 values.

Table 2: Comparing Appalachian household income relative to the U.S. household income distribution, 2006, 2008 and 2010

2006

US distribution	(less than $21,620)		($21,620 - $40,751)		($40,752 - $64,319)		($64,320 - $100,207)		(greater than $100,208)	
	Bottom quintile	**M.o.E**	**2nd quintile**	**M.o.E**	**Middle quintile**	**M.o.E**	**4th quintile**	**M.o.E**	**Top quintile**	**M.o.E**
Appalachian Region	25.29	0.201	23.39	0.232	20.78	0.216	17.91	0.209	12.63	0.131
Appalachian Sub-Regions										
Northern	24.00	0.298	23.44	0.379	21.57	0.334	18.52	0.228	12.47	0.215
North Central	27.88	0.658	23.98	0.628	20.18	0.572	17.56	0.564	10.40	0.408
Central	35.65	0.959	24.28	0.766	19.33	0.777	13.20	0.649	7.54	0.542
South Central	25.56	0.462	24.51	0.526	21.30	0.461	17.08	0.443	11.54	0.328
Southern	23.03	0.347	22.18	0.409	20.07	0.387	19.09	0.359	15.63	0.260

2008

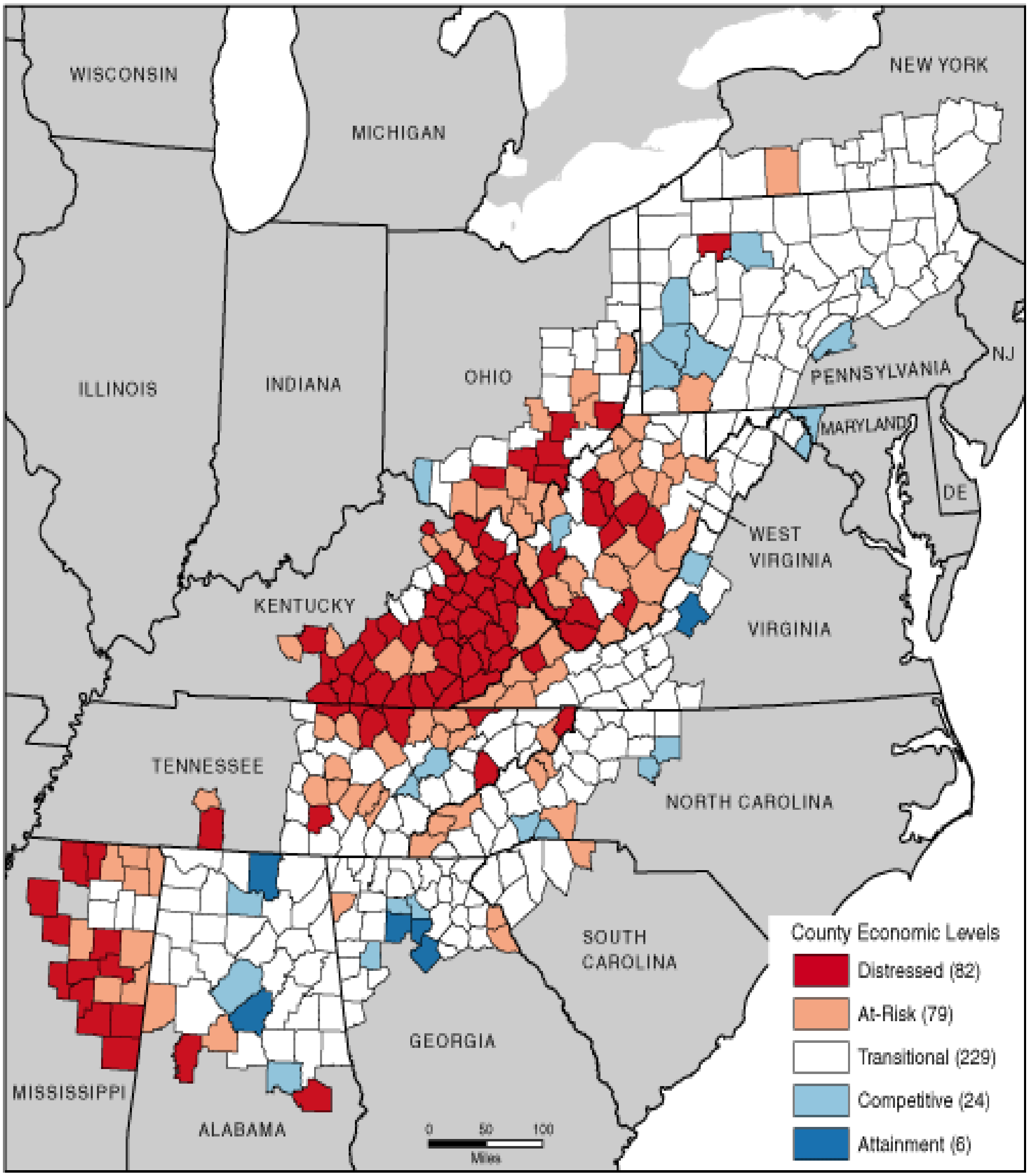
US distribution	(less than $21,575)		($21,575 - $40,520)		($40,521 - $64,426)		($64,427 - $101,300)		(greater than $101,300)	
	Bottom quintile	**M.o.E**	**2nd quintile**	**M.o.E**	**Middle quintile**	**M.o.E**	**4th quintile**	**M.o.E**	**Top quintile**	**M.o.E**
Appalachian Region	25.60	0.210	22.21	0.205	21.82	0.196	17.78	0.190	12.60	0.136
Appalachian Sub-Regions										
Northern	23.96	0.317	22.49	0.277	22.26	0.307	18.66	0.272	12.64	0.186
North Central	27.59	0.769	22.69	0.607	22.02	0.776	17.37	0.661	10.32	0.415
Central	36.36	0.786	23.79	0.725	19.75	0.719	13.34	0.646	6.76	0.428
South Central	26.38	0.590	23.46	0.536	21.83	0.481	16.97	0.414	11.36	0.382
Southern	23.54	0.367	20.49	0.378	21.76	0.373	18.58	0.408	15.63	0.289

2010

US distribution	(less than $20,148)		($20,148 - $38,933)		($38,934 - $61,601)		($61,602 - $99,000)		(greater than $99,000)	
	Bottom quintile	**M.o.E**	**2nd quintile**	**M.o.E**	**Middle quintile**	**M.o.E**	**4th quintile**	**M.o.E**	**Top quintile**	**M.o.E**
Appalachian Region	24.79	0.208	23.04	0.182	20.89	0.193	18.40	0.198	12.88	0.169
Appalachian Sub-Regions										
Northern	22.84	0.293	22.90	0.328	21.40	0.277	19.65	0.306	13.21	0.270
North Central	26.96	0.663	22.65	0.577	21.10	0.518	17.99	0.536	11.30	0.499
Central	33.62	0.842	24.94	0.735	19.17	0.806	14.18	0.555	8.10	0.454
South Central	26.04	0.516	24.31	0.466	20.86	0.442	17.59	0.478	11.20	0.388
Southern	23.29	0.387	22.02	0.405	20.67	0.413	18.68	0.425	15.34	0.322

Note: All dollar values are adjusted to reflect 2010 dollar values.

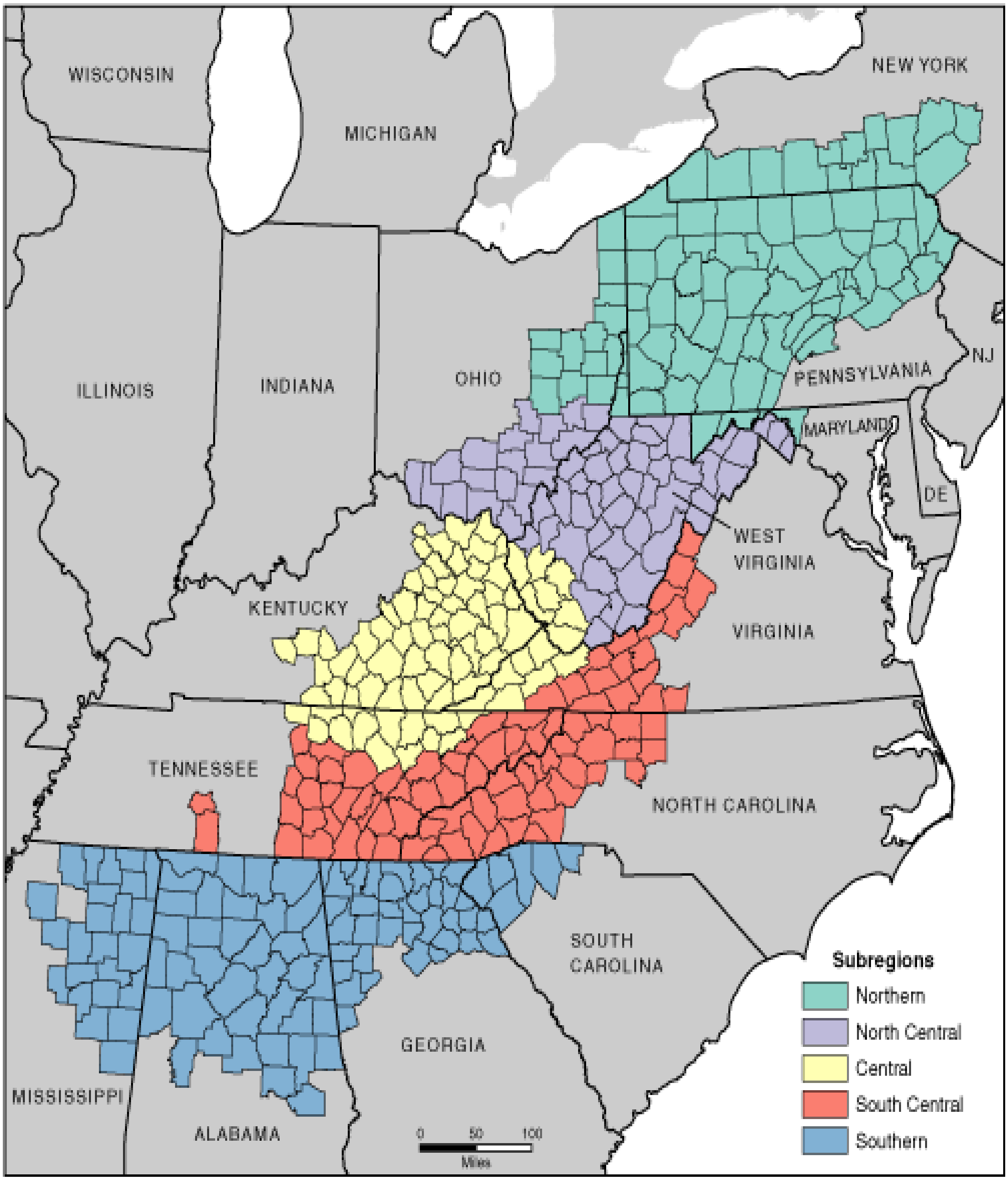
Figure 1: Counties that make up the Appalachian Region



Map by: Appalachian Regional Commission, October 2009.
Data Sources: U.S. Bureau of Labor Statistics, LAUS, 2005-2007;
U.S. Bureau of Economic Analysis, REIS, 2006;
U.S. Census Bureau, 2000 Census, SF3.

Effective October 1, 2009
through September 30, 2010.

Figure 2: Five subregions of the Appalachian region



Map by: Appalachian Regional Commission, November 2009.

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