

PART II - EVALUATING DISTRESS INDICATORS AND MEASURES

5. Appraisal of Backward and Forward Looking Indicators of Distress

5.1. Backward-looking Indicators of Distress

5.1.1. Cost of Living Index

Distress indicators are often based on a nominal dollar value. Some examples include PCMI and the poverty rate threshold. Differences in local cost of living imply that a given (say) \$20,000 poverty rate threshold is more binding in a high-cost location than a low-cost location. Thus, it seems logical that given its importance and interrelationships with other measures, we begin our discussion with the challenges in developing a local cost of living index.

There are many constraints in adjusting for local cost of living, including data availability and conceptual issues. With regard to data availability, the U.S. government does not produce a local cost of living index (COLI) that allows for comparisons in living costs. There has been discussion that the U.S. Bureau of Economic Analysis may, in the future, produce a COLI at the state level, but even within a given state, the differences in cost of living can be tremendous. Other measures of local cost of living include the U.S. Chamber of Commerce's ACCRA index, but this measure is only available for a subset of metropolitan areas, which would be inadequate for the needs of the ARC.

There are some “stop-gap” solutions for constructing local cost of living indices. First, the primary reason that cost of living varies across local areas is due to differences in housing costs (U.S. General Accounting Office, 1995). Across local areas, the costs of other goods and services vary much less than does housing. For example, it has been proposed that local poverty rate thresholds be adjusted for differences in cost of living using the U.S. Department of Housing and Urban Development Fair Market Rent (FMR) (see Jolliffe, 2006b for details). The FMR is essentially the cost to rent a “standard housing unit” at the 40th percentile of the housing distribution.³ The local COLI would be based on how much the local living costs are increased due to higher housing costs.⁴

The FMR COLI index has been criticized for its assumption that the cost of other goods and services do not vary across the nation. For example, prices of non-housing goods may

³According to U.S. Housing and Urban Development (2007), “FMRs are gross rent estimates. They include the shelter rent plus the cost of all tenant-paid utilities, except telephones, cable or satellite television service, and internet service.” According to HUD, FMRs are annually calculated for 530 metropolitan and urban areas and 2,045 nonmetropolitan counties and there is no data lag in their release. For more details of FMR, see <http://www.huduser.org/datasets/fmr.html>.

⁴The specific adjustment proposed for the poverty rate is based on the notion that a low-income household spends about 44% of its income on shelter and 56% on other goods and services. The key assumption is that non-housing goods and services costs do not significantly vary across locations (i.e., any non-housing cost differences tend to offset one another). Based on these assumptions, the cost of living index for a county c relative to the national average U.S. would equal: $COLI_c = 1 + .44(FMR_c/FMR_{US})$, where FMR is the fair market rent of the standard 40th percentile housing unit and the national average cost of living would equal 1. See Jolliffe (2006a, 2006b) for more details of how to adjust the poverty rate for local differences in cost of living.

significantly vary around the national average even if they are equal on average across the nation. Similarly, Nord and Leibtag (2005) and Partridge and Rickman (2006) argue that the FMR COLI “over adjusts” the cost of living because less-populated remote areas may have higher prices for some products, or some products may not even be available in such locations (e.g., there are no “big-box” stores in remote communities). Indeed, Kurre (2003) finds that there are rural-urban price differences across many categories of products—calling into question the basic assumption of the FMR COLI. Finally, the assumed 44%/56% housing-non housing expenditure share split may not accurately reflect consumption patterns for many locations.

There are also conceptual issues that call into the question the whole measurement of local cost of living. Economists have long recognized the pattern of compensating differentials (e.g., Roback, 1982). For example, locations with strong labor markets or “nice” amenities such as mountains, ocean views, or lakes will have relatively high housing costs and places that lack strong labor markets and other amenities will have low housing costs. Rather than indicating that a household needs less income to be as well off, low average housing costs often simply reflect the particular disadvantages of a location such as remoteness or poor environmental conditions (perhaps a toxic waste dump). The low housing costs compensate for these local disadvantages. Adjusting (say) PCMI upward to reflect a lower cost of living would overlook these other ‘debilitating’ factors that lead to lower housing costs.

Summary Evaluation: A county-level cost-of-living measure can be constructed on a timely basis, but there will remain conceptual problems in its interpretation as well as questions about its reliability. Possible gains in the use of this measure may be offset by concerns about the loss in precision.

5.1.2. Poverty Rate

The poverty rate is a key measure of community distress and is routinely used by ARC and other agencies. Though the ARC only nominally places a one-third weight on poverty rates, the current ARC distress indicator in fact closely mimics a poverty rate measure (Partridge, 2007). This follows because much of the variation in ARC counties is across their measured poverty rates (per capita income and the unemployment rate are not as variable). This outcome may be acceptable—but such a weighting scheme favoring the poverty rate is more accidental than explicit. Instead, the ARC may wish to have other factors play a stronger role in determining distress.

The official U.S. Census Bureau poverty rate is criticized for a variety of shortcomings. First, it is often denounced for *not* adjusting for local cost of living differences and it excludes informal or black market activity (Nord and Leibtag, 2005; Partridge and Rickman, 2006). Yet, as described in the local cost of living discussion in Section 5.1.1, it is not clear whether adjusting for “cost of living” differences would actually improve the poverty rate as a measure of community distress. Using poverty rates as a distress measure also introduces an arbitrary nature to the process. For example, households with incomes just above the poverty threshold would not be considered in “distress” even though they are clearly facing economic stress. Yet, a high local

poverty rate appears to be closely associated with the local area having a relatively high share of “low-income” households, including households just above the official poverty rate.⁵

The poverty rate also appears to be a very good measure of structural problems in a particular location. For example, local poverty rates are very persistent (Partridge and Rickman, 2006). Counties that had high (low) poverty rates 50 years ago tend to have high (low) poverty rates today. Thus, a high poverty rate is a good indicator of systemic structural problems that characterize underperforming locations both at present and over the long-term.

One of the biggest historical drawbacks of using the poverty rate is that it has been most reliably measured in the ten-year Census of Population at the county level. Thus, it is increasingly inaccurate as time elapses (Glasmeier et al., 2003), though relative poverty rates tend to change little over time (Partridge and Rickman, 2006). Intercensus annual estimates of poverty rates can currently be obtained from the U.S. Census Bureau’s Small Area Income and Poverty Estimates (SAIPE) (Hammer, 2000).⁶

A potential advantage of SAIPE data is that it is available at county and school district levels. At the same time, a limitation associated with the SAIPE estimates is that they are available with about a three-year lag. Moreover, these estimates are survey-based and are not as accurate for less-populated counties (Wood, 2005). Measures of economic deprivation could be augmented by other indicators that are available on an annual basis such as the percentage of households that receive food stamps or the percentage of children who qualify for free or reduced-price meals (at the school district-level). Yet, this would require further statistical analysis to construct a proper method to bridge these alternative measures to a conventional poverty rate.

Beginning in 2010, the U.S. Census Bureau’s American Community Survey (ACS) will produce poverty rates at the county, census tract, and block group levels on an annual basis (U.S. Census Bureau, 2006). With the ACS replacing the decennial census as a source of local economic and demographic data, this will overcome current concerns that poverty rates are increasingly outdated as time elapses from the past census. Another advantage of the ACS is that it will be released with about a one-year lag (which is far superior to longer release lags for the decennial census). Yet, for smaller rural counties and sub-counties, the ACS will use a five-year moving average, meaning that there still will be a delayed response for the ACS. Moreover, the ACS is sample based, which is subject to some error. For persistent measures such as poverty rates, this error is likely to be less severe than for other measures that are more variable over time (e.g., employment growth).

⁵For example, Partridge et al. (1996) and Levernier et al. (1998) report that local measures of income inequality are highly correlated.

⁶The U.S. Census Bureau’s SAIPE program was initiated to remedy the problem of the long ten-year interval in the census poverty rate. Annual county-level updated estimates for poverty and income are obtained using multiple regression analysis (with approximately a two-year delay). Predictors or independent variables used to create these estimates include the number of personal exemptions claimed on federal income tax returns by families with incomes at or below the poverty level, the number of people receiving food stamps, Census of Population, and Census Bureau population estimates. The Census Bureau (<http://www.census.gov/hhes/www/saipe/techdoc/quantify.html>) reports that the errors for the SAIPE program are larger than those in the ten-year Census. See Hammer (2000) for more details of the SAIPE program.

Summary Evaluation: The poverty rate is an essential distress indicator, though it has limitations in detecting future distress and it may not capture other dimensions of distress. ACS will likely prove to be an invaluable addition as a data source for the poverty rate, though it will reflect a five year moving average that will not be exactly current.

5.1.3. Unemployment Rate

The official unemployment rate reported by the Bureau of Labor Statistics has long been used by federal and state agencies as a core measure of economic distress (see the authors' comparison Table 3.1) or the underutilization of labor resources. This rate is defined as the number of unemployed workers divided by the civilian labor force in a community or region. Note that a non-employed individual must be *actively* seeking work to be officially considered unemployed.

As discussed in section 5.1.10 on population change and migration below, unemployment rates can fluctuate widely depending in part on the degree of attachment of workers and households to the local community. For example, unemployment rates in the Great Plains states are generally low not because the local economies are perpetually booming, but because people leave as soon as they lose their jobs given that they have little hope of finding new employment in the future (or they may not be attracted to remain in place with a harsh climate). The decision to leave is related, in part, to expectations about future wages; if expected wages and the odds of getting a job are high, then workers are willing to wait for some time, and be counted among the unemployed (e.g., Blanchflower and Oswald, 1995). Otherwise they will leave.

Further, as many authors have pointed out, unemployment rates do not include discouraged workers (those who have given up looking for work and are no longer counted as part of the labor force), underemployed workers (those who would like to work more hours or who are not in the types of jobs that take full advantage of all the skills that they have), and labor market churning of part-time and seasonal workers (Price and Wial, 2005; Bradley et al., 2001). Unemployment rates also reflect year-to-year cyclical behavior that may not reflect structural rigidities. In 2005, additional concerns arose over changes in the LAUS (Local Area Unemployment Statistics) methodology (Bishak communication to Brown, Chief of LAUS, BLS, Jan. 27, 2006) and how those changes affected the selection of distressed ARC counties. Nonetheless, the unemployment rate remains a widely used distress indicator and it is available annually with a two-year lag.

Furthermore, unpublished research on one southeastern Kentucky County found that the recorded unemployment rate rose dramatically after a major new manufacturing plant located there.⁷ The reason was not only that more local workers decided to re-enter the workforce in that county, but also that a number of out-migrants, who had left previously because they had no local opportunities, decided to move back after the new plant opened. Thus, local unemployment rates and economic activity do not always move in opposite directions.

⁷ Eldon D. Smith, University of Kentucky, pers. comm., ca. 1990.

In the ARC states of Ohio, Pennsylvania and New York, it is possible that unemployment rates have remained low despite on-going economic upheaval because residents have adjusted by leaving to find work elsewhere, especially in more recent years – e.g., see Grill’s (2003) discussion regarding Appalachian New York. In fact, our maps showing population change for 2000-2005 suggest that this may be exactly what has happened in these communities. We know from supplemental information and human capital theory (Snyder et al., 2007) that it is often the youngest residents, the future workforce, who are the most likely to leave because they have the most to gain from relocating (Grassmueck et al., 2007).

Summary Evaluation: The unemployment rate is easy to obtain and use, but it is also subject to considerable measurement error, and error of interpretation. We recommend that ARC explore the implications of dropping this variable as a measure of distress in favor of a population migration or change measure, coupled with a measure of job growth pending the results of the RFP on “Alternative Employment Measures of Economic Distress in the Appalachian Region,” referenced in section VIII of the present RFP.

5.1.4. Employment Rate/Labor Force Participation: Measures of Labor Market Strength

The employment rate and labor force participation are place of residence (POR) measures of labor market strength. As we note above, the unemployment rate is increasingly viewed as an unreliable and incomplete measure of economic distress. It misses discouraged workers, long-term unemployed, marginally attached individuals who are not seeking work, and it undercounts underemployed workers (Bradley et al., 2001; Price and Wial, 2005; Wood, 2005).

For these reasons, Partridge and Rickman (2003) argue that the *employment rate* (employment rate/population that is sixteen and over), in conjunction with annual employment growth, is a better indicator of overall labor market strength (see also below). While this clearly improves upon the simple unemployment rate, accurately adjusting for the size of the local working age population from public statistics can be problematic. For example, some communities have more high school dropouts and more senior citizens who are forced to work because they did not save enough for retirement. In such cases, using only the strictly-defined civilian workforce could be problematic, but it is possible to make adjustments for these abnormalities by using Census data.

Glasmeyer et al. (2003) proposed an Economic Health Index (EHI) that included a labor force to total population measure (LFPOP). The LFPOP corrects for two potential shortcomings in the traditional unemployment rate. First, it adjusts for counties that have a high dependency ratio with a large youth share of the population. Second, it adjusts for cases where there is a large share of the population that is not actively involved in the workforce—most notably discouraged workers who do not seek work due to the lack of employment opportunities.

In isolation, the LFPOP does not reflect the case where there is a large share of the labor force that is unemployed.⁸ Thus, to combine the influence of a high unemployment rate and a low labor force participation rate due to discouraged workers, the total residential employment over total population (EMP-POP) would address both concerns with one measure (Partridge and Rickman, 2006). If the ARC continues to measure distress with a labor market indicator, using EMP-POP would directly capture unemployment and discouraged worker effects and is more informative than an unemployment rate measure.

Summary Evaluation: The place of residence (POR) employment is available on an annual basis with almost no delay as part of the Local Area Unemployment Statistics series at the Bureau of Labor Statistics. Thus, it would be available in as timely a manner as the unemployment rate and conceptually can be used to construct superior measures of labor market distress.

5.1.5. Place of Work Employment Growth

Place of work (POW) county employment captures employment by employers located in the county. POW employment would provide more of a measure of the economic health of the county's employers. Conversely, place of residence (POR) employment better reflects the employment conditions of the county's workforce. POR employment differs from POW employment primarily due to in- and out-commuting patterns. As is often the case in rural counties, there is significant out-commuting to urban locations, which would imply POR employment could greatly exceed POW employment (and visa versa in core urban counties).

POW employment growth offers different information on the economic conditions of local employers and it also provides information about local job availability for local residents—to avoid commuting. Moreover, local job growth is very highly correlated with local population growth in the medium to long-term. For this reason, Partridge and Rickman (2003) argue that POW job growth could be a relatively complete measure of local economic conditions. Another advantage of the POW employment data (described below) is that it includes both wage and salary employment and self employment. Because self employment is sometimes associated with more entrepreneurial activities, this reflects another advantage of considering POW employment data. Monitoring self employment then serves another ARC goal of trying to encourage entrepreneurship (ARC, 2007).

The largest possible shortcoming of POW job growth data is that it may not fully reflect conditions for employed residents (who may be out-commuting). Namely, ARC has primarily defined distress as it relates to the residents of a particular county—not the county's employers.

Summary Evaluation: Annual POW employment data are released by the U.S. Bureau of Economic Analysis with about an eighteen month delay. Thus, they are as timely as the per capita market income measure used in ARC's current distress indicator. Yet, POW employment data do not perfectly reflect place-of-residence (POR) prosperity, which should be weighed in any decision to adopt it.

⁸The Glasmeier et al. (2003) index also included the relative county unemployment rate.

5.1.6. *Income per Person, Ratio of Income Maintenance and Other Payments to Income*

At first glance, income per capita would seem to be the single-best indicator of human welfare and well-being. Calculated as the total income earned in a place divided by the total population, it is a measure of the productivity of workers and the ability of owners of assets or entitlements to command resource flows. However, like the unemployment rate, this variable also has shortcomings as a measure of distress, or lack thereof, when it is applied to different geographic units. First of all, as discussed earlier, per capita income does not account for differences in the cost of living over space. For example, the prices of homes tend to be very high in cities or on the coasts of the U.S., as well as in high-amenity areas of the nation's interior. This reflects not just differences in the quality or size of the home, but also different costs of land (rents). Residents may also be willing to give up income in exchange for the ability to live in a high-amenity area. In this case, they may be just as well off as a higher-income household living in a low-amenity area (as mentioned above).⁹

Second, there may be variations in the size of the workforce earning the total income, and this can lead to misleading results. For example, Utah notoriously ranks near the bottom of all states in terms of per capita income (47th), but that does not mean that the average household or adult resident is poor. In fact, the state does much better in income per household rankings. The explanation for this finding is that average family size is quite large in Utah, with a relatively high number of children who are not of working age, so a given amount of total income is divided by more people.

Per capita income also does not reflect average wages, or earnings power, because it does not adjust for labor force participation. As an alternative, *growth* in per capita income does indicate whether a place is moving towards “attainment,” all else being equal. Per capita income also does not measure income distribution, such as high levels of income inequality. Other than including the poverty rate, this drawback could be overcome by including measures of income inequality or median household income (these measures likely will be available annually from the American Community Survey (ACS) starting in 2010). One advantage of using income per capita as a measure of distress is that it is available annually, with about a two-year lag, from the U.S. Bureau of Economic Analysis, though median household income may become the preferred measure beginning in 2010 with the expansion of the ACS. Furthermore, it is easily understood as an indicator of distress, subject to the caveats discussed above.

Personal income is derived from three sources: labor, transfers and property (see Table 5.1). The ARC has long recognized that transfers should not be included as a part of income when assessing distress, and as such, it uses a “market-income” measure instead. This excludes “retirement and disability insurance benefit payments, medical payments, income maintenance benefits payments (e.g., food stamps), unemployment insurance benefit payments, veterans

⁹ Earnings in cities (places with high population density) are higher not only because worker productivity is higher, but also because employers have to pay workers more so that they will be compensated for disamenities related to urban congestion. This is a complication for present purposes, since the ARC region includes both metro and non-metro counties, and more generally, is “uneven” in how it includes or excludes cities within its states (Isserman and Rephann, 2005: 346).

benefit payments, and other such payments” (ARC, 2007). Similarly, the Conference Board uses personal income minus transfer payments when it assesses the health of the national economy (see discussion of economic indicators below). Yet, omitting transfer payments does mean that government-based retirement income is left out, which could overstate the amount of distress in locations with significant retirees.

Sources of Personal Income in the U.S.	2005
<i>All numbers are per capita</i>	
Personal income	\$34,471
Net earnings ^a	23,956
Personal current transfer receipts ^b	5,149
Income maintenance	532
Unemployment insurance benefits	109
Retirement and other	4,507
Dividends, interest, and rent ^c	5,366
<i>Source: U.S. BEA Regional Economic Information System, 2007</i>	
<i>a. Labor, b. transfer, c. property income.</i>	

Table 5.1: Sources of Personal Income in the U.S., 2005

Because of the recognized shortcomings of per capita personal income as a measure of distress in any given county, we examine three alternative measures here. In particular, we consider income maintenance, retirement and dividends, interest and rent (DRI) payments separately as a share of total personal income. Our examination reveals the relative importance of each of these in the different ARC counties. These relative indicators (rates) could potentially offer a number of interesting insights into the vitality of local county economies that previously have not been considered directly. While we are able to present only national average for these variables here, we know from experience that these measures vary widely across the individual counties of the ARC region.

5.1.7. Income Maintenance Payments

The first indicator is income maintenance payments as a percent of total personal income in the county. This formulation is also used by Feser and Sweeney (2003), who argue that this approach: (a) not only gets around the problem of variations over space in relative costs of living differences, but (b) that it also generates a *rate*, which can more easily be used for benchmarking purposes.¹⁰ They argue that the fact that the level of income per capita has been increasing for the most part over time makes it difficult to establish a “distress threshold that facilitates comparisons of the incidence of distress over both time and space” (p.43). This ratio is calculated as total income maintenance payments divided by total personal income.

¹⁰ Note that this is not a perfect correction, because income maintenance expenditures are not adjusted regional income maintenance expenditures are not adjusted for regional cost of living differences (just as federal income taxes paid by individuals do not depend on where they reside). Jolliffe (2004) reports a reversal of poverty rankings for metro and non-metro counties when HUD’s FMR adjustments are used to correct for cost of living differences (see: <http://www.npc.umich.edu/publications/workingpaper04/paper13/04-13.pdf>). He finds that the FMR index is 20 percent lower in non-metro than in metro regions. Since the ARC region includes both metro and non-metro counties, the use of such adjustments would also impact county rankings.

Figure 5.1 shows that the ratio of income maintenance payments to total personal income nationally only moves between 1 and 1.6 percent, so it is quite small. However, transfer payments may be relatively more important in lower-income areas, such as in the Appalachian Region. While the ratio fell noticeably between 1995 and 2000 (the period which included the major welfare reform act of 1996, PRWORA and a major economic expansion), it has increased consistently again since 2001. As expected, this measure tends to coincide, in general, with the national business cycle.

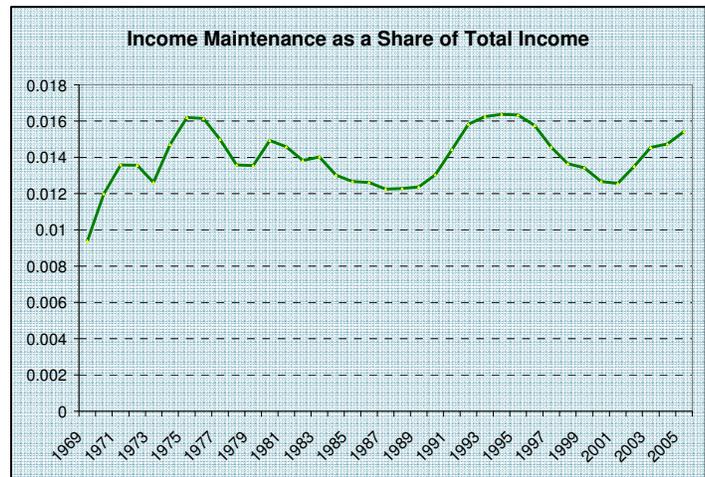


Figure 5.1: Income Maintenance vs. Share of income (data source: BEA, REIS)

The rationale for including this ratio as a measure of economic distress would be as follows. The larger the share of total income in a given community that is comprised of income maintenance payments, the less healthy – or distressed – is that community. Likewise, in a community that is becoming less distressed over time, this ratio will fall even if payments per capita are rising (so long as total income is rising at an even faster pace). *This ratio could be used as an alternative to the poverty rate.* As an important caveat, however, note that this ratio only appears superficially to be independent of the poverty rate. To the extent that eligibility for income maintenance transfers is poverty-based, the difference between the two series is more apparent than real. This measure also has the advantage of being more up-to-date, in theory, than the poverty rate previously based on the decennial Census to the extent that individuals have to reapply annually for transfer payments (though the expansion of the ACS will eliminate this advantage). Yet, a shortcoming is that transfer payments imperfectly reflect household poverty or local economic degradation.

5.1.8. Retirement Income

A second, novel indicator to consider is retirement income in a county as a share of total personal income. Not surprising, given the baby boomer bubble working its way through the labor force, this share has been rising steadily over the last 35 years (see Figure 5.2); it has almost doubled, from 6.8 percent of all income in 1969 to 13.1 percent in 2005. Whether or not this ratio by itself is an indicator of current or future distress can be debated. In declining communities, a strategy of driving local economic growth based on retirees will succeed only if the pipeline of retained (i.e., new) or return retiree migrants remains full. Otherwise, it is only a matter of time before this source of income *growth* dries up, and such a strategy will not be sustainable. Similarly, older retirees may be a drain on local health and human services.

Thus, in order to be reliable, this measure has to be viewed in conjunction with another – that of population change. If that population change is negative, then a relatively larger share of retirement income in total income would suggest that the community is in decline. Conversely, if the population is also growing, attracting well-to-do retirees, then the community is less likely

to be distressed. Before making a final recommendation about this indicator, and the others discussed here, some empirical sensitivity analyses would need to be carried out to assess the reliability of these numbers. However, like the other indicators considered here, this one is available annually with only a two-year lag from the Bureau of Economic Analysis.

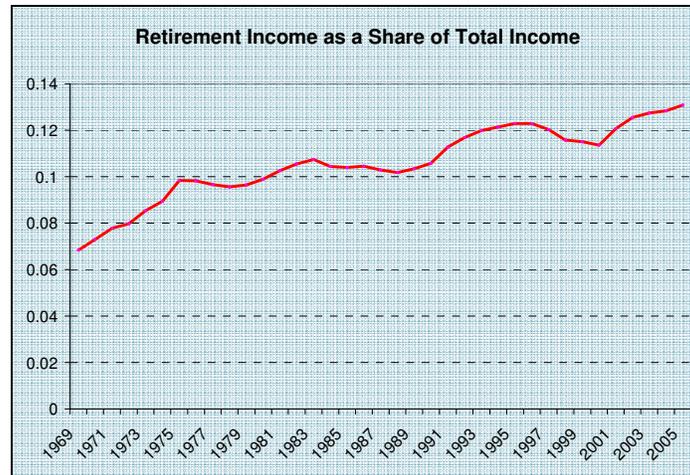


Figure 5.2: Trends in Retirement Income as a Share of Total Income
(Data source is BEA, REIS)

5.1.9. Income from Dividends, Interest, and Rent

Economists and others usually focus on income as a flow measure to assess the level of distress or well-being of a community. While labor income represents a return on individual's work effort, another important component of total personal income is derived from a stock rather than a flow variable -- the payment of dividends, interest and rent based on assets owned or wealth held. Pryor (2007) presents empirical evidence that these kinds of payments are accounting for the growing income inequality in American society. He argues that to the extent that "wealth begets more wealth," this trend will only increase in the future.

Figure 5.3 shows this source of income fluctuating between 14 and 20 percent of total personal income, with a downward trend occurring since about 2000. That is, total personal income has been rising more rapidly than income from dividends, interest and rents. We believe that examining this measure as a timely, supplemental indicator of economic well-being in a community would be useful in future analysis. Often this kind of income can provide a buffer against short-term fluctuations in local labor markets—e.g., if a manufacturing plant closes. As the figure shows, this income stream tends to be relatively independent of the national business cycle, unlike the income maintenance payments.

Other authors (e.g., Low, 2005) have also included the value of housing or an imputed rental value, as done by Pryor (2007), as well as the value of agricultural land, to measure local wealth in the form of fixed assets. A few of the counties in Central and Southern Appalachia score very high on the agricultural land value, but we hesitate to include this in the index. The reason is that the value of the land can only be extracted if it is sold. More generally, this discussion points to the fact that there are other important assets to consider in the region to assess the level of distress in a given county.

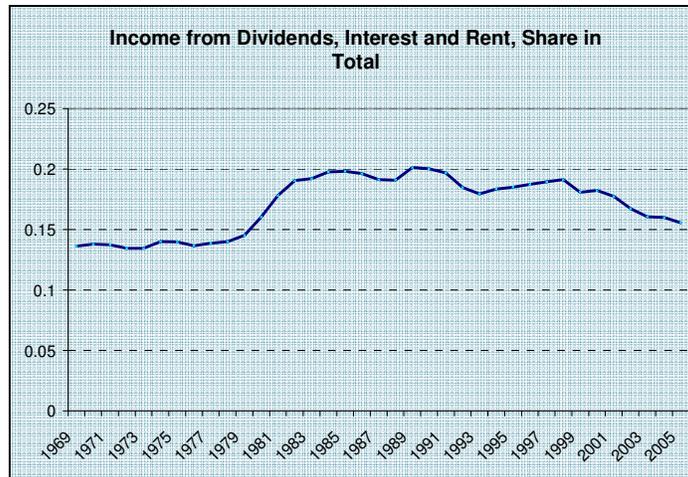


Figure 5.3: Trends in Income from Dividends, Interests, and Rent (Share in Total)
Data sources: BEA and REIS

Summary Evaluation: While intuitively appealing and easy to collect, per capita market income is completely dominated in the current ARC formula by the poverty rate. This variable says very little about the distribution of income within a county. One approach is to look at change in income over time. Theoretically, we would expect to observe some convergence – at least among the rural counties. The ARC should evaluate how income maintenance and dividend, rent and interest payments as a share of total income are related to distress. The relative importance of retirement income also should be explored, in conjunction with population change.

5.1.10. Out-migration/Net Migration/Change in Population

The notion that people “vote with their feet” in determining where to live is a widely-used measure of distress (Feser and Sweeney, 2003). Whether measured in terms of out-migration, net-migration, or change in population, it is apparent that people will on-balance leave areas that have some sort of combination of a weak economy or poor quality-of-life and move to areas that have strong economies and/or more favorable quality-of- life features. Thus, it reflects underlying economic conditions and quality of life as shown by the *actual* behavior of the residents – i.e., it is not an estimate produced by academics or public agencies. Because migration is both monetarily and psychologically costly, it also reflects the long-run expectations of the migrants as to where they will be most content to reside (Grassmueck et al., 2007).

There is conceptual debate regarding what population change actually measures. For example, population loss could indicate distress or alternatively, it could indicate a desired adjustment to distress (Feser and Sweeney, 2003; Partridge and Rickman, 2006). Regarding the latter point, if a location is suffering from hard economic times, then it is often helpful if some residents relocate to regions that are experiencing greater economic growth. By reducing labor market competition, such relocation mitigates the economic pain in the origin region while helping the workers who find employment elsewhere. Many economists would argue that such migration is helpful in

promoting economic adjustment and should not be impeded by providing government aid to the declining region. They say such aid would slow the needed adjustment—prolonging the agony (Glaeser, 2005).

Other economists disagree and argue that population change is a direct indicator of distress. In particular, they note that a declining population may produce further distress. For example, it could lead to a vicious cycle of negative expectations that lead to a lack of private investment. Out-migration can be especially problematic for distressed communities if it is associated with a brain drain of the most talented or entrepreneurial individuals. Likewise, if fewer people are left to support a fixed public infrastructure, this would lead to higher taxes, which will further depress an area. Moreover, with concerns about sprawl and congestion in large growing American metropolitan areas, influxes of new residents from declining areas can lead to further increases in monetary costs for new infrastructure, as well as implicit costs. Finally, another advantage of using net-population change is that it also constitutes a *forward-looking* measure of a location's vibrancy because residents who are considering relocating are weighing future economic and quality-of-life prospects in their origin versus their potential destination.

In addition, the process of net migration or population change can also obscure some traditional measures of economic distress such as the unemployment rate (Grill, 2003; Partridge and Rickman, 1997, 2003, 2006). For example, Appalachian New York has experienced significant economic dislocation in recent decades. Rather than experiencing a sharp increase in the unemployment rate, this area has seen a steady out-migration of its residents. This pattern stands in stark contrast to the pattern in Central Appalachia where downsizing in natural resource based industries has led to sharp increases in local unemployment rates (because the unemployed tend to remain in their Central Appalachian homes). Therefore, using net migration would act as a complementary indicator to other labor market indicators.

It should be noted that net migration (or relative population change) has some limitations. Not all households can easily move. Likewise, in other settings, rapid population growth may make matters worse for the existing residents of the destination community. Partridge and Rickman (2005) found that some low-income regions experience considerable population growth. In such cases, Nord (1998) noted that low-income areas often attract new high-poverty residents who desire low-skilled occupations and “affordable” housing. Brown, Lobao, and Digiacinto (1999) also found clusters of low-income counties in the Ohio River Valley region of Appalachia that were attracting migration streams of new high poverty residents. This type of in-migration may create local “poverty traps” (see also Glaeser et al., 2000). After weighing these strengths and weaknesses, when net-population change represents increased distress (not just an adjustment to past distress), it is most sensible to use it as a distress indicator.

In the ARC region, the general pattern since about 1970 is that North Appalachia has faced significant net-out migration (especially New York and Pennsylvania) and South Appalachia has experienced significant net in-migration (Lichter et al., 2005; Pollard, 2005). The central region tends to fall in-between, though in far Southwest West Virginia and Southeast Kentucky, there is a clear distressed pocket that has experienced significant net-out migration (Pollard, 2005). This pattern would suggest that one advantage of using a net-population change measure is that it would better capture (potential) distress in North Appalachia (and parts of Central Appalachia),

while other measures such as the poverty rate would better reflect distress in other parts of the ARC region.

If a net-population change measure was adopted as a distress indicator, it should be calculated over a time period of sufficient length -- at least five years -- so that it adequately reflects distress and not short-term random variations or shocks. Likewise, when considered over a long enough timeframe, net population change is very closely linked to employment growth (Partridge and Rickman, 2003).

Regarding the proper population change measure, out-migration by itself would be inadequate due to the significant churning that naturally arises. For example, the typical Appalachian county generally has significant out-migration regardless of the net change in population (Lichter et al., 2005; Pollard, 2005). Indeed, rapidly growing regions like the northern suburbs of Atlanta have significant in-migration, but they also experience considerable out-migration (e.g., return migration).

Summary Evaluation: Population change or migration would capture elements currently lacking in the existing ARC indicators. The preferred population measure would be either the change in total population or net migration. Over longer periods, net migration and change in total population are very highly correlated because the natural increase in population is relatively uniform across the country. For example, Atlanta is growing so rapidly not because its population has a high birth rate, but because it has high net in-migration. Another advantage of considering either net population change or net migration is that they are available on an annual basis with only about a nine month delay from the U.S. Census Bureau.

An additional measure that may be helpful for planners in the ARC region is annual data on the origin of in-migrants to a given county or the destination of a county's out-migrants. Are they moving to nearby areas or are they leaving Appalachia in general? Such in- and out-migration data can be obtained from the IRS through its income tax database. It is available with about a two year lag and it is very inexpensive (\$500 per year for the entire U.S.).¹¹ However, though income tax filers mostly represent the universe of migrants, it does miss undocumented workers and domestic non-tax filers, so it is not entirely complete.

5.1.11. Demographic Characteristics and International Immigrants

Demographic characteristics such as race, ethnicity, age, gender, and immigration status may serve as distress indicators insofar as they denote the presence of at-risk or disadvantaged populations. Native Americans, African Americans, and Hispanic populations historically have had higher poverty rates than non-Hispanic whites. Poverty is also higher among recent immigrants, children under 18, single-parent households (especially those headed by women), and the elderly (particularly elderly women) (Glasmeier, 2006; Schiller, 2008). These general national relationships tend to apply across geographic territory—for example, counties with a higher proportion of such disadvantaged groups usually fare worse on poverty and other

¹¹More details of the IRS county-to-county migration data can be found at <http://www.irs.gov/taxstats/indtaxstats/article/0,,id=96816,00.html>.

economic distress indicators (Glasmeier, 2006; Glasmeier et al., 2003; Partridge and Rickman, 2006). A number of studies of Appalachian counties also find an association between the disadvantaged demographic groups above and greater distress using the ARC measures (Haaga, 2004; Wood, 2000; Wood, 2005).

County indicators of the presence of at-risk or disadvantaged populations can be constructed by simply using the proportion of the population in the socio-demographic groups above from the decennial censuses. Most studies assessing the determinants of poverty and other distress factors, including the ARC distress indicators, employ such proportional measures. But, they use them as determinant rather than outcome (i.e., distress) variables. A drawback of using sociodemographic variables is their timeliness. The U.S. Census Bureau's annual American Community Survey (ACS) will provide five year averages on such variables for all counties beginning in 2010 (U.S. Census Bureau, 2006). In addition, the census contains finer-grained data whereby the proportion of the population in poverty (and other income-level variables) by gender, race/ethnicity, age, and family status are available by county. Finally, other (nonproportional) measures have been developed that pertain to the well-being of different groups and we discuss these below.

Although numerous sociodemographic indicators can be measured, some are more pertinent than others for Appalachia. The recent ARC Strategic Plan (2004) notes that demographic shifts such as population aging and rapid increases of new populations with less proficient English language skills could affect future performance goals, so it is reasonable to scrutinize both age and immigration.

With regard to age, the number of children (under age 18) and older adults (ages 65 and older) are sometimes combined in a measure termed the "dependent population." This refers to the proportion of residents in age groups less likely to fully support themselves through participation in the labor market. Counties with higher dependent populations have greater economic distress nationally (Glasmeier et al., 2003; Wood, 2005), and to some degree, in the Appalachian region as well (Wood, 2005). However, this combined age measure is becoming less relevant to distress. There has been a long-term decline in the proportion of children, while the Appalachian elderly are growing as a proportion of the population due largely to net-outmigration of young adults (Haaga, 2004). The population over age 65 represents 14.3% of Appalachian residents compared to 12.4% of all U.S. residents (Haaga, 2004).

Most aging is done in place -- in-migration of retirees to Appalachia is relatively low and concentrated in a few counties. As a distress indicator, the aging population is limited. Poverty rates among the elderly are lower than those of children. Haaga (2004) also points out that older Americans are now more of a resource for communities. Many are able to work and those up to age 75 are not heavy consumers of public services. Thus, as described in Section 5.1.8, an aging population itself will continue to be a less relevant indicator of distress in the future.

International immigration at the county level is customarily measured using the data from the decennial censuses, which uses the term "foreign born population," defined as people who are not U.S. citizens at birth (MPI, 2003). This population includes naturalized citizens, legal immigrants, legal non-immigrants (e.g., refugees and persons on student or work visas), and

persons illegally residing in the United States.¹² Recent immigrants (those who arrived in the U.S. five years prior to the Census) also are documented.

Currently, immigration does not appear to be an indicator of distress as it pertains to most Appalachian counties. First, studies of ARC counties note that growth in the immigrant population has been much less in the region than the rest of the county, at least based on data from the 1990s (Lichter et al., 2005; Pollard, 2004). In 2000, the foreign born represented just 2.7% of the population, compared to 11.1% for the total U.S. population (Lichter et al., 2005). Pockets of higher immigrant populations, however, are found in northern Georgia, university settings, and parts of the Carolinas (Pollard, 2004). Second, there are data limitations. Measures of immigration at the county level are dependent on the decennial censuses, although they will soon be available through the ACS. Other data sources currently do not provide coverage of small geographic areas (MPI, 2003). These sources include the Current Population Survey conducted by the Census Bureau for the Bureau of Labor Statistics as well as the New Immigrant Survey.¹³ Third, the degree to which new immigrants conceptually tap the concept of “distress” is debated. Some analysts argue that new immigrants, even undocumented immigrants, are beneficial to the economy while others argue the opposite. (See Martin and Midgley (2006) for a discussion of research findings on the topic).

Another set of demographic variables, race and ethnicity, have been identified as important in assessing distress by ACR reports and published research. Wood (2005) notes “counties and regions that have been persistently distressed invariably share one characteristic in common: a relatively high level of minorities.” Ethnic concentration (density) and segregation have been studied by social scientists for many decades and are known correlates of economic distress (Glasmeier, 2006). In Appalachia, the non-Hispanic African American population remains the largest minority group, although the Hispanic population has grown rapidly (Pollard 2004). This contrasts with the U.S. as a whole where the Hispanic population now exceeds the African American population. Pollard (2004) notes that the minority population varies markedly in Appalachia, with southern Appalachia having a 19 percent minority population, compared to 7 percent of northern and 4 percent of central Appalachia in year 2000.

In addition to simple proportional measures, demographers and other social scientists have developed a variety of other measures that can be adapted to comparisons across the region. For

¹²By way of comparison, the term native refers to people residing in the United States who are U.S. citizens, that is, people: born in one of the 50 states or the District of Columbia; born in the U.S. Insular Areas such as Puerto Rico or Guam; and born abroad of a U.S. citizen parent (MPI 2003).

¹³The CPS is a monthly survey of approximately 60,000 households designed to assess monthly economic conditions. It represents the civilian non-institutional population, rather than the full resident population as represented by the decennial censuses. MPI (2003) notes: unlike “the Census 2000 and ACS data, with their sizable sample populations, robust analyses of CPS data are generally restricted to the national level and to select geographic areas with sizeable populations.” Other government surveys include the Survey of Income and Program Participation (SIPP), the National Health Interview Survey (NHIS), and the American Housing Survey (AHS) but their use for studying the foreign born is restricted by their relatively small sample sizes. The New Immigrant Survey (supported by NIH, INS, NSF, the Department of Education, and PEW Charitable Trusts) was piloted in 1996 with the first wave conducted in 2003 and second wave conducted in 2007. Its geographic coverage is limited to the top 85 Metropolitan Statistical Areas (MSAs) and the top 38 counties, with a random sample of 10 MSAs from among the rest of the MSAs and a random sample of 15 county pairs from among the rest of the counties (see NIS, 2006).

example, the Hoover index of concentration is a measure of the proportion of ethnic population in a county relative to its land area. It ranges from 0, where there is an extreme dispersal, to 100 indicating extreme concentration (Lichter and Johnson, 2006).

The most commonly used measure of segregation is the Index of Dissimilarity Dt which measures the degree to which two ethnic groups (e.g. whites/others) are evenly spread across geographic units, such as census tracts.¹⁴ Segregation type indicators, although widely used, raise several issues. Measures vary as to their particular strengths and limitations for highlighting geographic patterns (Brown and Chung, 2006). These indicators were developed for cities using neighborhood or tract data. For segregation measures like the Dt to be useful in comparisons among counties in Appalachia, data below the county level, such as block level (Lichter et al., 2007) and block-group level data (Lichter et al., 2008) can be used, but this entails computational time. Multi-racial categories used first in the 2000 Census also add complexity for handling aggregate data (Lichter and Johnson, 2006).

Other indicators from reports and published research that could be considered are variables measuring women's employment and labor force participation (see 5.1.4). Wood and Bischak (2000) note, for metropolitan areas in the region in 1997, that female employment was over-represented in less skilled jobs, while male employment had a relatively higher percentage share of higher skilled employment when contrasted with other U.S. metropolitan areas. Women's status is often measured by the proportion of women in the labor force, which Brown et al. (2005) found was lower in the Ohio River Valley counties composing Appalachia. Measures based on proportional-based comparisons between men and women in employment sectors, labor force, and earnings can be constructed from decennial census data or the ACS after 2010. The Institute for Women's Policy Research (Caiazza et al., 2004) provides examples of labor force and other variables that be constructed for states and many of these measures are applicable to counties.

Summary Evaluation: The aging and immigrant populations do not appear to be highly relevant as distress indicators across most of Appalachia at present. Variables measuring race/ethnicity and gender could be given greater scrutiny as to their usefulness as markers of distress.

5.2. Forward Looking Measures of Distress

ARC distress indicators are backward looking in the sense they are measuring past structural problems. They do not necessarily reflect whether underlying conditions will change in the future and whether some currently non-distressed counties are at risk of falling into future distress. Thus, we will describe some other indicators of distress that we believe will better reflect *future* structural conditions in the county. To be sure, there will be some overlap. Many of

¹⁴If the minority and white percentage are equal across all counties, then Dt is equal to 0, meaning racial segregation is low while a score of 100 means complete segregation. The Dt has as straightforward meaning. A score of 60 is high and indicates that 60% percent of either the white or the minority group must move to different geographic unit for the two groups to be equally distributed (Glasmeier, 2006).

these measures will reflect both past and current conditions, as well as signal future expectations for structural problems.

5.2.1. Net Migration/Population Change

The previous discussion in Section 5.1.10 regarding net migration/population change noted that expectations regarding migration are inherently forward looking (Topel, 1986). Future expectations about the local economy and the quality of life help drive migration decisions by both potential in- and out-migrants. As noted above, data availability represents a key advantage of using net-migration or relative population change. However, it was noted that a key problem with using net migration is that it may reflect the needed adjustment process to structural problems, in which it alleviates distress rather than indicates distress.

5.2.2. Building Permits and Housing Measures

Along with food and clothing, housing is a basic human need. Homes are not only the single largest expenditure item (33% of the total) and the most important asset for many Americans, but a home address is essential for accessing gainful employment and to assure worker productivity. The quality of housing and its affordability are important dimensions of county-level distress used by HUD. Improving housing quality has long been a key operational objective of the ARC, and when the Economic Research Service (ERS) recently compiled a housing distress measure, the ARC region did not figure prominently on the resulting map (see Figure 5.4 below). The ERS map relies on Census 2000 data and may be out of date given the upheaval that has occurred in housing markets since 2006.¹⁵

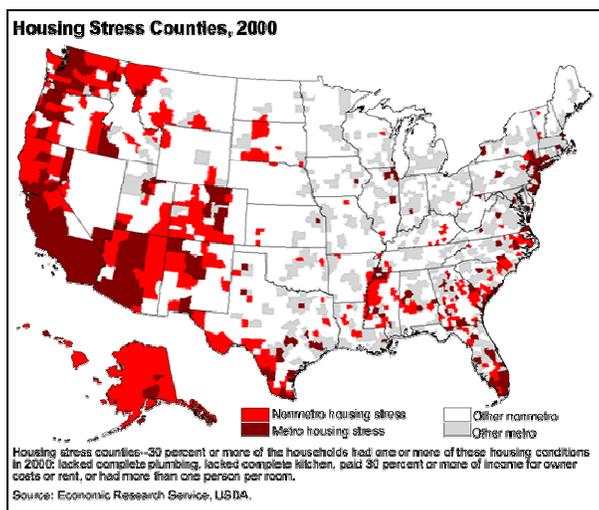


Figure 5.4: Housing Stress Counties, 2000

Housing affordability is another way of looking at housing as a potential problem area. This measure relies on Census data and usually is based on the ratio of the median home price to the

¹⁵ <http://www.ers.usda.gov/briefing/rurality/typology/maps/Housing.htm>

median household income in a community (a value greater than 3.0 indicates distress), or the share of homeowners and renters who spend more than 30 percent of their income on housing. Housing affordability is more of a problem especially on the coasts and in high-amenity scenic areas, as noted in Section 5.1. High home vacancy or foreclosure rates in a community also reflect an inability of homeowners to afford the homes in question.

Another more subtle indication of housing problems or shortages is the spatial mismatch phenomenon, where individuals cannot afford to live in the communities where they work. For example, Hilton Head, South Carolina is one such community, where service workers need to commute in from outlying areas. This is also a concern in a number of fringe counties in the ARC region (Mather, 2004). For policymaking purposes, however, it is sometimes difficult to ascertain how individuals voluntarily make the trade-off between nicer homes and longer commutes (e.g., residents of Pike County, PA have very long commutes into New York City, where many formerly lived, but in return, they can afford bigger homes with larger lots).

Here we focus on a different dimension of housing than the quality of and access to the existing stock. In part, we do this because the measures that have been used in the past are based on Census data and there is some uncertainty about the reliability and timeliness of their release for small counties once ACS is fully operational. Second, we know that a strong correlation exists between housing values with poverty rates. Thus, including these static indicators does not really provide any new and independent information about local economic distress beyond what is already derived in current distress indicators.

Thus, instead of looking at the traditional housing measures, we consider local county business permits as an independent forward-looking indicator of housing conditions. These permits can reveal predictions of future conditions in a county as assessed by the local real estate industry and other private investment decisions. *Economy.com* sells current county data at \$200 per county or \$2,000 for a regular subscription on building activity and housing affordability, updated quarterly. This data source is potentially relevant for this and other sections of our report, but their emphasis is on metropolitan areas and it is not clear how good their data are for non-metro areas. Further investigation would be needed to assess the reliability of *Economy.com*'s nonmetropolitan housing indicators, but their use seems to be a reasonable possibility.

County Detailed Employment & Output Forecast

- Payroll employment, industrial output and wage forecasts for all U.S. counties.
- Includes both real and nominal output for 21 two-digit NAICS categories, 89 three-digit NAICS categories, and 284 four-digit NAICS categories.
- Complete coverage of government, military personnel and farm employment.
- History begins in 1970 and extends to 30 years of forecast for counties. History and forecasts are updated quarterly with adjustments monthly. Frequency is annual.

County Forecast

- Covers all U.S. counties.
- Approximately 100 variables, including one-digit employment, total and wage & salary income, population and households, labor force and unemployment rate, bankruptcies and retail sales, residential permit issuance, single-family and multifamily housing stock, existing sales, sales price, affordability index and mortgage originations.
- Annual forecast out 30 years. Updated monthly.

Source: <http://www.economy.com/home/products/databases.asp?pid=30-00004-00&src=serviceOverview#30-00004-00>

Table 5.2: *Economy.com* County-Level Employment and Forecast Availability

Housing construction is one of the ten variables that make up the index of leading economic indicators used to forecast national recessions and expansions. A key reason for using this variable is that as housing construction expands, so does the demand for consumer durables such as new refrigerators, cabinets, copper wiring, etc. In other words, new housing construction not only provides employment for construction workers, but it also has a multiplier effect in the economy at large. New housing construction in any one county is unlikely to have such a large multiplier effect, to the extent that manufacturing plants supplying the inputs may be located elsewhere. However, new home construction does indicate that the local private sector expects future growth in the community, and it creates important demand for the services of local bankers and real estate agents, among others, even as more and more of these transactions move to the web.

In a community that is in decline, or in distress, new building activity is likely to be subdued or non-existent from one year to the next, whether measured on a per capita or existing housing stock basis.¹⁶ In vibrant communities, on the other hand, new building permits are likely to be issued on a regular basis, which would also be reflected in rising land values (e.g., Kilkenny and Johnson, 2007). These building permits data are available, at no cost, from the U.S. Census Bureau with only a one-year lag. This is an enormous advantage over other housing statistics, which are usually two years out of date before they are released. In addition, it is also possible to gauge the quality of the new housing stock as measured by the average value of the new homes that are being built, which are also reported in these statistics. Yet, one weakness with the U.S. Census Bureau's building permit data is that not all local governments regularly report their data as part of the county total (e.g., a rural township). One way to overcome this problem is to

¹⁶In using this measure, one would need to control for factors such as age of the existing housing stock, cost of or availability of land, etc. For example, Allegheny County, PA is less likely to offer vacant green space for new housing construction at a relatively low price. One would also need to further investigate some abnormalities that occur in certain counties. For example, Columbia County, NY (just north of NY City) is seeing growth in the construction of new, high-end homes even as the county is depopulating and the local unemployment rate relative to the state's average is rising. To capture this kind of (suspected) "gentrification" on the edges of the ARC region, the distress indicator selected needs to have multiple variables.

monitor the change in permits, which would be more accurate if the reporting jurisdictions within each county remained constant over time.

Limitations of Building Permits Data. The portion of construction measurable from building permit records is inherently limited since such records obviously do not reflect construction activity outside of the area subject to local permit requirements. For the nation as a whole, however, less than 2 percent of all privately owned housing units built are in areas that do not require building permits.

The reported statistics are also influenced by the following factors. 1) Some building permit jurisdictions close their books a few days before the end of the month/year, so that the time reference for permits is not, in all cases, strictly the calendar month/year. 2) A study spanning four years showed that about 3 percent of the single-family houses built in permit-issuing places are built without a permit.

To the extent that most of these limiting factors apply rather consistently over an extended period, they may not seriously impair the usefulness of building permit statistics as prompt indicators of trends in residential construction activity.¹⁷

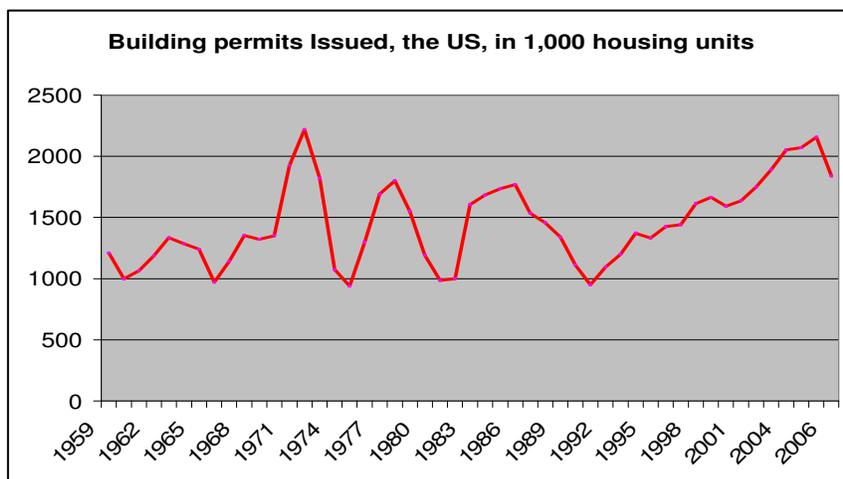


Figure 5.5: Trends in Building Permit Issued in the U.S. (1000 units)¹⁸

5.2.3. Housing Vacancy Rates

Housing vacancy can be a sign of building neglect and abandonment, which in turn, result from economic distress. It is important to determine if this is correlated with foreclosure data. The national vacancy rate has recently edged up sharply to above 2.5 percent for the first time, even as housing affordability has become a major issue in some regions. In other regions, it is likely that the vacancy rate is being partially driven by foreclosures or depopulation, which can lead to a downward spiral of economic decline if it portends a future decline in residential construction.

¹⁷ Questions should be directed to Manufacturing and Construction Division, U.S. Census Bureau, Washington, D.C. 20233-6900. Phone: (301) 763-5160. <http://www.census.gov/const/C40/Sample/placeprt.pdf>, p.4

¹⁸ Source: <http://www.census.gov/hhes/www/housing/hvs/historic/histtab2.html>

In many communities, recent foreclosures are likely to be the result of excessive speculation associated with the housing bubble that was driven in part by subprime lending. It is not clear to what extent this has been an issue in the Appalachia. If this measure is used, it will be have to be based on the ACS.

5.2.4. Foreclosure Data

Another sign of economic distress in a community is likely to be that of widespread housing foreclosures. This can set off a spiral of socioeconomic decline that includes rising crime rates.¹⁹ The RealtyTrac website (<http://www.realtytrac.com/>) makes foreclosure data available on a real-time basis, and this is one critical advantage of this data source.

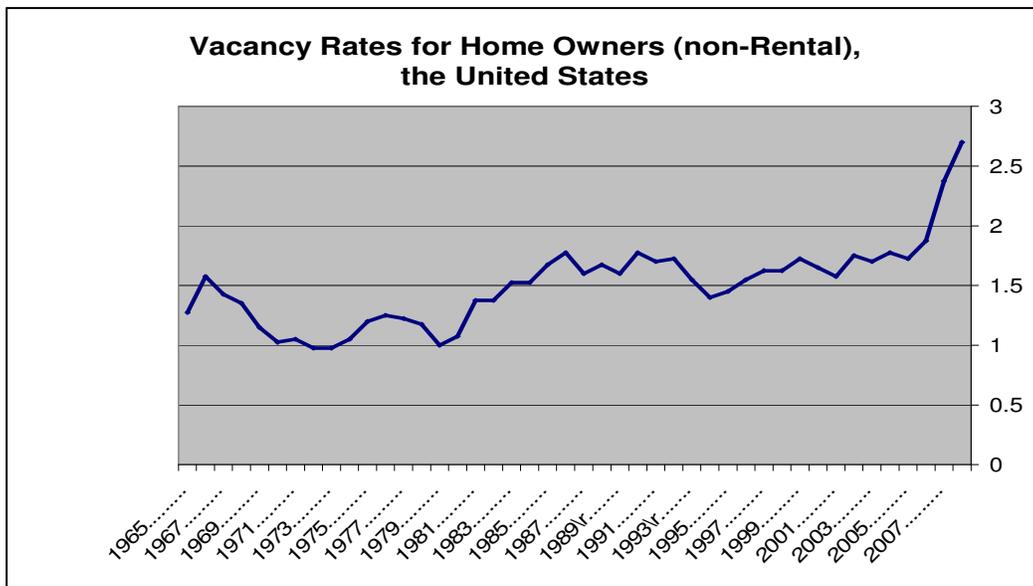


Figure 5.6: Trends in U.S. Vacancy Rates, 1965-2007
(Basic data are from U.S. Census Bureau)

According to the website, the numbers are updated *daily*. No other publicly collected and reported data sets even come close to matching this source in terms of timeliness. It is perhaps the single-best measure of what is happening in counties at this moment in time, rather than what happened two years ago. Yet, we caution that the recent attention on the number of home foreclosures will likely wane as past (discontinued) lending practices underlie much of the current ‘crises’.

¹⁹ See the recent *New York Times* article “Foreclosures Force Suburbs to Fight Blight,” March 23, 2007; also Immergluck and Smith, 2006. The latter study suggests that increases in foreclosure rates are associated with higher neighborhood crime rates.

Summary Evaluation: The housing sector is notoriously cyclical, often driven by speculation, but it may be too important as a measure of local economic well-being for ARC to ignore. The conventional measure of housing quality and affordability, however, may no longer be effective in distinguishing ARC from non-ARC counties. Building permits, and the rate at which they are or are not issued over time, are an important economic indicator about the future. But it is not clear if building activity itself is sufficiently large to have county-wide impacts. Housing also needs to be examined in the context of population change – are new homes just being built for wealthy in-migrants (in bedroom communities) who do not spend their money locally in any meaningful way, or does such construction reflect genuine expansion of local employment opportunities? One option, subject to caveats discussed above, is to use only a lack of new housing construction as an indicator of local stagnation, or distress. Local vacancy rates may be a better long-term indicator than foreclosure rates, but the former are available only with considerable lags, highlighting the trade-off between accuracy or relevance and timeliness of indicators.

5.2.5. Self-Employment and Entrepreneurship

One of the key facts of the “New Economy” is that individuals are increasingly working for themselves as opposed to others. Especially in rural regions, reported rates of self-employment have risen dramatically over the last 35 years (Goetz, 2008). Figure 5.7 shows an increase in the share of self-employed in rural areas from 18 to 27 percent, with similar changes occurring in urban areas. If these trends continue, then about one in three rural workers will be self-employed by 2015. Because self-employment is a forward-looking measure of future conditions, we view a county’s ability to sustain self-employment (as an alternative to unemployment) as one indicator of future well-being.

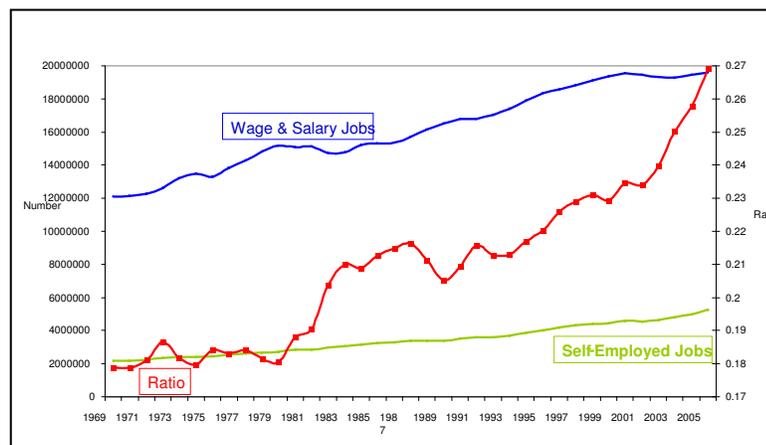


Figure 5.7: Trends in Rural Wage and Salary vs. Self-Employment Jobs and Ratio of Self –Employed to Wage and Salary Workers, 1969-2005 (Goetz, 2008; basic data are from BEA, REIS)

Bradley et al. (2001) dismiss self-employment or proprietorship formation as offering much promise for the region because they believe it to be “motivated by the absence of alternative means of economic subsistence” (p. 50). Even so, they acknowledge that in attainment counties, higher rates of such activity could reflect the opportunity to earn higher incomes or achieve

greater independence (the direction of causation here is not obvious). It is clear that self-employment reflects the lack of other economic opportunities in some communities, and we cannot dismiss this possibility.

Further, the returns to self-employment relative to wage-and-salary employment have been declining noticeably over time. It is not clear to what extent this relative decline is a result of the fact that productivity growth among the self-employed is not keeping up with that of wage-and-salary earners, whether it simply reflects under-reporting of earned income, or whether it represents a trend towards more casual forms of self employment.²⁰ Despite these challenges, we believe that as a new reality of working, the concepts of self-employment or entrepreneurship should be considered as a potential measure of economic distress by ARC. Emerging research (e.g., Shrestha et al., 2007) also suggests unequivocally that self-employment has important second-round effects in terms of stimulating wage-and-salary employment at the county-level. Furthermore, Rupasingha et al. (2007) found that self-employment was associated with statistically significant reductions in poverty rates at the county-level during the decade of the 1990s.

One clue about the extent to which self-employment growth in an Appalachian county is *radical* (response to opportunity) as opposed to *reactive* (response to necessity) may be found in the returns to self-employment. This aspect was not considered by Bradley et al. (2001), but these returns could be included in any assessment of entrepreneurship in a community. The ability to distinguish between reactive and radical self-employment is very important, and the ARC might consider further research in this area. By examining the so-called non-employer statistics, it may also be possible to assess changes by sector – e.g., manufacturing as opposed to basic or advanced producer services, although disclosure problems are likely to arise in less-populated counties.

As an alternative and independent verification of entrepreneurial energy in a county, *County Business Patterns* data could be examined for changes in establishments, especially those that are smaller, in different sectors that could be separated into more or less advanced. These data are available with two year lags from the Census Bureau, U.S. Department of Commerce.

Summary Evaluation: Given the increasing importance of entrepreneurship and self-employment in terms of their numbers alone, we believe that more research is urgently needed to distinguish between self-employment as a necessity versus an opportunity within the ARC region. Such an indicator needs to be evaluated in the context of the FY2007 employment RFP issued by ARC.

5.2.6. Educational Attainment

The human capital model suggests that greater educational attainment would raise average wages (Borjas, 1996), and in turn, higher PCMI. Along with higher wages, greater average educational attainment is associated with lower unemployment and higher labor force participation. Thus, it

²⁰ For example, the so-called Tax Gap of non-reported income was estimated to be around \$365 bn in 2001, the most recent year for which estimates are available. This gap likely accounts for an important part of the relative decline in returns to self-employment since it is easier to under-report this type of income than wage-and-salary earnings.

is not surprising that if greater average education is associated with higher wages and labor force participation, it also is associated with lower poverty rates (Partridge and Rickman, 2006). For this reason, education attainment is clearly an underlying determinant of current levels of distress.

Moreover, educational attainment is a very good predictor of future economic growth over long periods of time (Partridge, 1997; Glaeser and Shapiro, 2003; Simon, Curtis, and Nardinelli, 2002). With decreasing emphasis on traditional natural-resource based and manufacturing sectors and a simultaneous increase in the importance of the New Economy, human capital and education's role will likely grow over time. In sum, if a locality has low levels of educational attainment, it will likely have higher current levels of poverty and unemployment and lower PCMI, as well as higher *future* levels of these measures. For these reasons, average educational attainment would in many cases directly account for the underlying causes of current and future local distress. Conversely, poverty, unemployment, and low market income are often *symptoms* of low educational attainment.

In terms of data availability, a key drawback of using educational attainment has been that it has been only available at the county level from the decennial census. Yet, as described in the poverty rate discussion in Section 5.1.2, it will be annually available at the county and census tract levels beginning with the 2010 ACS. Using educational attainment does have some drawbacks. Though, on average, it is a reasonable proxy for human capital, it does not necessarily reflect the quality of education. For example, a high school degree in Chattanooga may be of different quality than in Huntington, and so on. Likewise, any measure of educational attainment has an arbitrary nature. For instance, if a distress indicator used the percent of the adult population with a high school degree, one could always ask why not use the percent with at least an Associates Degree or a Bachelors' Degree. Of course, such problems are not unique to educational attainment.

Summary Evaluation: Educational attainment should be considered an important candidate for inclusion in a distress index due to its availability after 2010 and its backwards and forwards looking nature.

5.2.7. Natural Amenities and Natural Capital

One of the strongest predictors of local growth dating back to the 1930s is natural amenities, especially climate (Rappaport 2004, 2007). Natural amenities are important because they are complementary to a local tourist industry and help attract workers—especially more-mobile high skilled workers (Partridge et al., forthcoming). Natural amenities also are conducive to attracting retirees and supporting businesses. As a measure of natural amenities, the U.S. Department of Agriculture's Economic Research Service has produced an index of natural amenities based on climate, access to water, and landscape topography.

Nonetheless, Deller et al. (2001), Deller and Lledo (2007), and Ferguson et al. (2007) note that natural amenities may be insufficient to stimulate local growth without adequate man-made facilities. For example, human investment is needed to build a ski resort. This creates an added measure of complexity when incorporating man-made facilities with natural amenities.

Every several years, the USDA updates its National Resource Inventory. This inventory contains a large database of natural and manmade “amenities” at the county level. In attempting to combine this immense database into a usable form, Deller et al. (2001) and Deller and Lledo (2007) use the principal-component statistical approach to combine multiple measures into one unit of analysis. For example, they create a water recreation component by combining the number of boat launches, the number of lakes, the number of fishing sites, and so on into one variable. The problem with using a principal-component measure as an indicator of distress is that it has a “black-box” feel and the resulting lack of transparency may create controversy.

Summary Evaluation: It is currently not feasible to use natural amenities or natural capital as an indicator of distress. Nonetheless, it may be helpful if the ARC produced indicators of natural capital, but these would probably be most useful as supplementary measures for federal, state, and local planning.

5.2.8. Local Industry Composition

Communities with high shares of at-risk industries are more predisposed to experience future distress. Historically, Appalachian communities with economies most intensively engaged in natural resource activities such as manufacturing, timber, and mining have suffered due to labor-saving technological change. Likewise, since the mid 1990s, communities with significant shares of labor-intensive manufacturing have been at increasing risk due to global pressures (e.g., Bernard et al., 2005; Herzenberg, 2005). These patterns have been very persistent, dating back to the 1950s for natural resources and to the early 1970s for manufacturing-intensive communities.

A measure of predicted future economic distress could be easily constructed based on expected industry trends. The shift-share prediction is simply the predicted county growth rate if all of its industries grew at the expected national growth rate. This prediction accounts for whether the county has a composition of fast or slow-growing industries (Blanchard and Katz, 1992).²¹ For example, it would predict slow growth for a county that has a high share of natural resource employment or manufacturing, with greater predicted growth for counties with emerging sectors. The shift-share measure performs quite well as a predictor of local economic growth, especially if the industry disaggregation is quite fine. Therefore, in using this measure, a given county can be viewed as a strong candidate for future distress if it fell below a certain threshold in terms of future predicted growth.

The predictions for national industry growth can be derived from U.S. Department of Labor data. Private vendors such as EMSI, IMPLAN or REMI can also be employed at a moderate cost to produce national estimates.²² The advantage of using private vendors is that they can be used on short notice and be responsive to the Commission’s schedule, though this does entail an expense.

²¹The shift-share measure is simply the sum of the product of initial county-level industry composition multiplied by the *expected* national industry growth rate. Specifically, for county i in period 0, the expected county growth rate over the next t years would be: $INDMIX_i = \sum_j (Share_{cj0}) \times NATGWT_{j(0-t)}$, where j refers to industry, NATGWT refers to the predicted national growth for sector j between periods 0 and t and the summation is over all industries.

²²For more details of EMSI’s products, see <http://www.economicmodeling.com/index.php>. Their pricing suggests that their entire package for the entire nation can be purchased for \$20,000, with an annual fee for new data.

Of the private vendors, EMSI is one firm that has been recommended to the authors as having innovative products. The novelties of EMSI include that its products are very easy to use on its web-based interface and they are flexible. For example, EMSI's GIS based tool means that its products can be used to construct reports within a user-defined distance of a point—and thus, it can produce reports for an entire region surrounding a county (e.g., within 100 miles). Regarding county-level forecasts and economic development data, both EMSI and IMPLAN can produce results at the 6-digit NAICS level where they employ algorithms to fill in suppressed data that are not disclosed by the government.

The ARC or private vendors could be called upon to produce individual county forecasts that are more complete than the simple shift-share forecast. However, such forecasts would be much more expensive to produce on an annual basis.

Another related measure that would be of interest for the ARC, states, local economic development areas, and counties is whether the region or county has emerging industry clusters that could be “growth engines.” For example, a county with a particular high share of employment in a fast-growing set of related industries is blessed with an emerging cluster that could spur rapid economic growth. Various private vendors could help produce data on clusters. For example, using the EMSI tool, Purdue University has been working with the U.S. Economic Development Administration to provide county-level measures of clusters for economic development planning. Going forward, ARC and its partners could produce their own cluster analysis using EMSI, IMPLAN, REMI, or other vendors.

Summary Evaluation: The ARC should consider more sophisticated measures of industry composition and clusters for its state and local partners. However, it is not clear how to include these measures in a distress index that only utilizes three or four primary indicators. While measures of industry composition and clusters may not have the priority of these other indicators, they will be useful adjunct or secondary indicators for planning purposes.

5.2.9. The Knowledge/Creative-Based Workforce

For a number of years, adults living in rural areas could count on jobs in the agricultural, manufacturing, or extractive industries to secure gainful employment, regardless of their educational credentials. But as a result of technological advances, improved efficiencies in production, expansion of global competition, and greater government restrictions on mining activities, counties across Appalachia find themselves increasingly challenged in terms of maintaining and strengthening their local economic conditions.

The ability of communities to compete in a global marketplace increasingly rests on their success in capturing and expanding their knowledge-based workforce (Munnich and Schrock, 2003). Knowledge is defined as an intangible resource that enables individuals to use information, education, and past experiences to create ideas and innovations (Henderson and Abraham, 2005; Metcalfe and Ramlogan, 2005). According to Henderson and Abraham (2005), knowledge is the key driver of the U.S. economy. As such, understanding how the ARC region compares in terms of its success in expanding its knowledge-based economy is worth considering.

What remains a challenge is finding a metric that captures the knowledge sector of a local area. Recent studies have provided some straightforward approaches. For example, Henderson and Abraham (2004) view knowledge workers as those engaged in “management, business, financial, professional and related occupations,” positions that require a high level of knowledge in order to complete complicated job-related tasks. In a similar vein, Florida’s (2002) discussion of the “creative class” is closely aligned with the measurement proposed by Henderson and Abraham. The only exception is the inclusion of “high-end sales and sales management” workers in Florida’s measure of the “creative class.”

Occupations that constitute the knowledge/creative sector of a county’s workforce are outlined below. They represent occupation categories now in use by the Census Bureau to describe the occupational complexion of counties in the U.S. counties.

- Management occupations (except farmers and farm managers)
- Business and financial operations occupations
- Computer and mathematical occupations
- Architecture and engineering occupations
- Life, physical, and social science occupations
- Legal occupations
- Education, training and library sciences
- Art, design, entertainment, sports, and media occupations
- Health care practitioners and technical occupations
- High-end sales (composed of the following two sales categories: (a) sales representatives, services, wholesale and manufacturing; (b) Other sales and related occupations, including supervisors).

Determining the proportion of the county’s workforce collectively employed in these occupational classes can offer some inkling on how ARC counties are faring in terms of its engagement in the type of knowledge/creative activities that are seen as a key source of long-term economic growth. Of special concern is determining the extent to which economic distress is tied to the inability of counties to grow the knowledge/creative sectors of their economies.²³

Summary Evaluation: Monitoring changes in the workers in the ARC that are employed in occupations associated with the knowledge/creative-based economy would be useful in determining how well the region will perform in an important sector.

²³Research studies indicate the ability of local areas to capture and expand knowledge/creative-based jobs is dependent on a number of important factors. They include: (1) the availability of talented, well-educated and trained workers; (2) access to productivity-enhancing information and communication technologies; (3) public policies and local institutional systems that support innovation; (4) nearness to institutions of higher education that help facilitate the education and skill enhancement needs of knowledge workers, and serve as generators of new ideas and innovations; (5) physical proximity of the community to larger metropolitan areas; and (6) the availability of natural resource amenities (Barkley and Henry, 2004; Cortwright, 2002; Goetz and Rupasingha, 2003; Henderson and Abraham, 2004; Powell and Snellman, 2004; Romer, 1998). Having these important components in place could be a major challenge for nonmetro areas, according to Powell and Snellman (2004), given their historic dependence on physical inputs or natural resources, versus intellectual capacity, as the foundation of their economies.

5.2.10. Health Status of the Population

Basic personal health is both a cause of and determinant of economic well-being (or distress). In the past, the ARC used infant mortality as an indicator of economic distress but dropped the measure once the region had caught up with the rest of the nation. Likewise, in less-populated counties, annual changes in infant deaths led to significant fluctuations in the infant mortality rate. Another difficulty in mortality data interpretation is sorting out the place of death (say a hospital in an urban county) vs. the parents' county of residence.

County-level data for different causes of death are available from the CDC annually, and could be used as supplemental measures of economic distress within ARC counties. However, according to the CDC website (accessed 12/30/07), geographic information will no longer be supplied effective with the 2005 data.²⁴ While the CDC might provide such information to ARC upon request, including such a measure may not provide sufficient additional independent information to justify the costs to the extent that health status and income are relatively highly correlated. Even so, the mortality data can be used to demonstrate an important statistical feature of any indicator-type data, including some of the variables used by ARC to identify distressed counties. This is demonstrated using Figures 5.8 and 5.9.

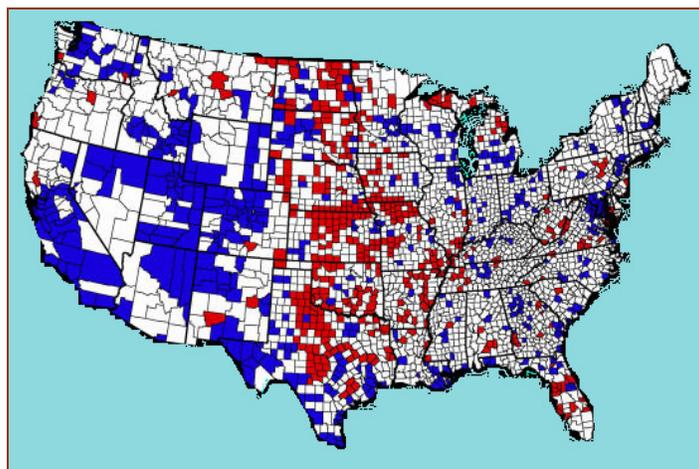
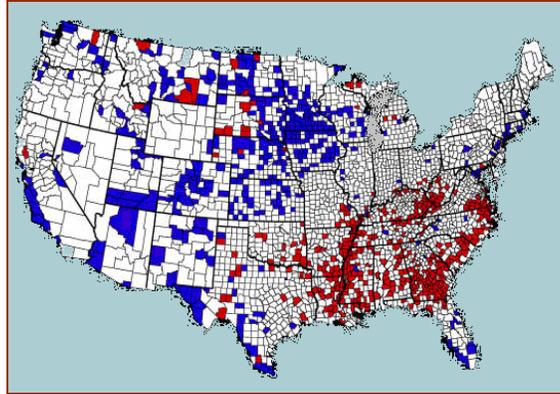


Figure 5.8: Unadjusted Mortality Rates, 1993–1997
Red = High Mortality White = Normal Mortality
Blue = Low Mortality

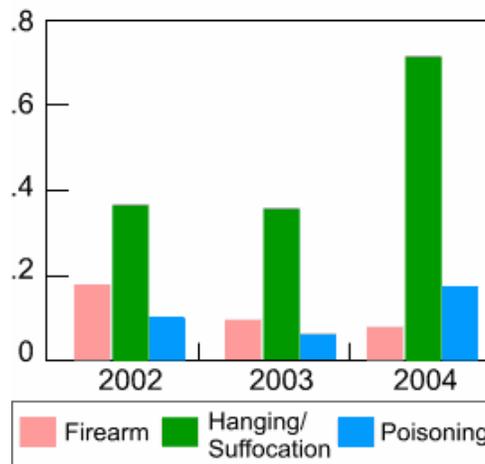
²⁴ http://www.cdc.gov/nchs/products/elec_prods/subject/mortmcd.htm#description1



Source: James et al. (2004)

Figure 5.9: Age Adjusted Mortality Rates, 1993–1997
Red = High Mortality White = Normal Mortality
Blue = Low Mortality

Figure 5.9 maps the county-level mortality rates with and without adjustments for age. It is important to note the higher rates of mortality in the ARC counties once the data are adjusted for age of the population. The age-adjustment is an important correction in this case. More generally, the main point to note here is that ARC counties may show up as problem counties (distressed) only after we control for certain variables. This has to be considered in the selection of final variables to be included in the distress index.



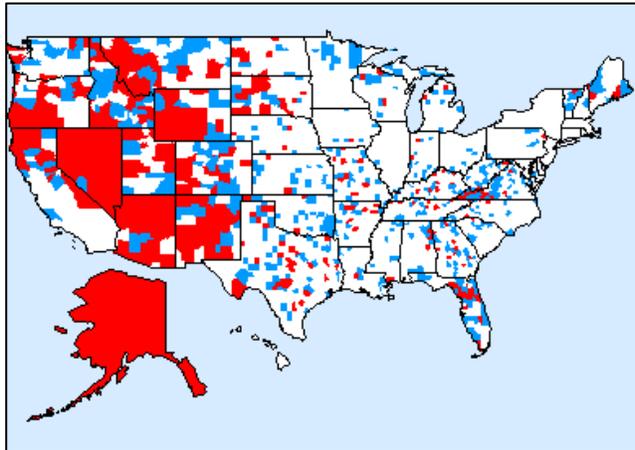
Source: CDC

Figure 5.10: Suicide Rates among Girls Ages 10-14 in the U.S., 2002-2004

Suicide. Figure 5.10 shows suicide rates among young girls in the U.S. from 2002 to 2004. Suicide rates, especially among youth, can be an indicator of severe local economic distress, rather than reflecting only personal or family predisposition.²⁵ For example, suicide rates among farmers tend to rise during periods of farm financial crises, while the same tends to be true of young adults who have lost hope for a positive future. Figure 5.11 suggests that relatively high

²⁵ The graphic is from <http://www.cdc.gov/datastatistics/archive/youthsuicide.html>

rates of suicide are a problem in parts of the Appalachian region; note that the problems seem even more pronounced in the West (often believed to be associated with higher gun ownership), but this is optically misleading because of the larger county sizes in the West. Also, suicide data do not capture unsuccessful attempts by individuals to end their own lives.



Suicide Rates 1989-1998		
Legend		# of Counties
	At or above the 90th NATIONAL percentile	(308)
	At or above the 75th but less than the 90th NATIONAL percentile	(460)
	Less than the 75th NATIONAL percentile	(2304)

Data source: http://webappa.cdc.gov/cdc_mxt3/
Figure 5.11: Suicide Rates, 1989-1998

There is growing recognition in the literature that suicide is important – and increasingly common – in rural areas (e.g., Singh et al., 2002), and that these areas are also ill-equipped to deal with the problem (Fiske et al., 2005). At the same time, researchers are finding that community- or neighborhood-level features, especially poverty and economic decline, are associated with higher suicide rates (Rehkopf et al., 2006). These regional characteristics, or the local ecology, may be just as important as individual-level characteristics (e.g., a family history of depression and suicide) in explaining suicide or other risky behaviors (Whitley et al., 1999; Hill et al., 2005, the latter based on United Kingdom data).

The CDC does not report suicide rates for individual counties when the numbers in question are so small as to preclude anonymity of those afflicted. However, experts who have worked at CDC with the data suggest it is possible to obtain actual numbers by using “rolling” 5-year windows in the web-enabled data extraction software. Even so, given the costs involved in collecting the data relative to the additional new information provided, we feel it is not feasible or desirable at this point to include suicide data in the index constructed to measure distress in ARC counties. This does not mean, however, that pronounced changes occurring in any one county over time should be ignored as a supplemental measure of distress.

Summary Evaluation: It is important to acknowledge the relationship between economic distress and human health measures, including mental health as reflected in suicide rates. Nevertheless, given the data limitations and recent changes at CDC in the geographic detail with which data are reported, it is not feasible at present to include these variables as indicators of economic distress. Suicide rates and related health data (deaths from cirrhosis of the liver, for example) could be tracked on an adhoc basis by ARC counties.

5.2.11. Local Government Capacity

Local government capacity is a general concept reflecting fiscal health and resources such as size, staffing, and expertise available to governments that increases ability to act on behalf of their citizens (Peterson, 1981; Reese and Rosenfeld, 2002). Limited government capacity can be considered an indicator of distress insofar as it constrains efforts to improve community conditions. Smaller, resource-poor governments usually provide fewer services for residents and local businesses (Kraybill and Lobao, 2005; Peterson, 1981; Reese and Rosenfeld, 2002). The ARC notes the importance of improving the capacity of local governments in its strategic plan for 2005-2010 (ARC, 2004).

Although “capacity” may be intuitively understood by policymakers, actual measures are problematic. First, social scientists employ numerous indicators of capacity encompassing size, staffing, and fiscal health. There is little consistent use of these indicators and respective measures across studies, so that benchmarking standards are not established.

Second, capacity indicators vary in relevance to assessing distress. Size of government variables (such as government employment per capita and general revenue) and staff attributes (such as the presence of different types of professionals) do not provide information about how governmental resources are allocated to match to population needs, nor do they denote the fiscal conditions of governments (Reese and Rosenfeld, 2002). Capacity, as measured by the fiscal health of governments, is more reflective of distress. These measures vary widely but most are constructed with the idea of assessing how fiscal conditions of local government are balanced with community attributes or needs. Conventional measures include ratio of own-source revenues to own-source expenditures, the ratio of own-source revenue to aggregate county income, property taxes per capita, and per capita tax revenues (Reese and Rosenfeld, 2002). Other measures of fiscal health include debt burden and bond ratings, but coverage of small governments is a problem with these measures (Hendrick, 2004).

Fiscal health measures also have limitations. Reese and Rosenfeld (2002) note most measures of fiscal health focus on ability to raise revenue. These measures have much to do with external conditions outside government, particularly residential income and wealth and public willingness to pay for services. Fiscal measures also are not straightforward distress indicators because they often result from complex processes involving long-term community adaptations (Reese and Rosenfeld, 2002). For example, Johnson et al. (1995) found that counties with higher poverty had low fiscal burdens as measured by the ratio of own-source revenue to aggregate county income, in contrast to their expectations. They explain this finding by noting that high poverty counties adapt to an environment of weak revenue generation and place less tax burden on residents but provide fewer services. In such cases, it is difficult to argue that local government capacity is related to higher quality of life for citizens.

In addition to general issues above about local government capacity as an indicator of distress, there are issues specific to constructing measures for the ARC region. One is the unit of government to which data are referring. Measures could be constructed using county government as the reference point. However, this would neglect distress of municipalities and other local governments. To account for other local governments, measures could be constructed

whereby all local governments (including county government) are aggregated to provide a county-area government capacity measures (see Johnson et al., 1995 for an example). Second, functions and ability to tax and spend vary by state and even within states property tax rates and other conditions vary. To account for such variations, measures should be general enough to be applicable across states and proportionate, where the numerator and denominator use relevant base figures.

Third, data sources must be considered. The major data source on local governments is the Census of Governments and conventional variables on fiscal health described above are typically created from this source. However, the Census is conducted only every five years. Also, data quality is not uniform across all counties (Stephens and Wikstrom, 2002). For small counties, data are often less detailed and aggregated up to larger categories. Other measures can, in principal, be constructed using long- and short-term debt obligations from the Census and bond rating variables available for purchase from investment companies such as Moody's. But small counties are less likely to have any data on debts and bonds available for them.

Summary Evaluation: Local government capacity is not a transparent indicator of distress but could serve as an adjunct or secondary indicator to track needs of particular counties. We suggest use of conventional fiscal measures such as own-source revenues to expenditures noted above that can be derived from the Census of Governments. Although these measures have limitations, they are generally applicable across states and data are available for small counties. Fiscal measures should be evaluated for their association with external distress conditions (i.e. poverty, income, unemployment) to ensure that the former are capturing the local context appropriately. For a general assessment of government capacity, we suggest aggregating all local governments to create this measure for county areas.

5.2.12. Social Capital and Its Link to Economic Well-Being

There is an expanding body of research that suggests that social capital has an important impact on the economic health of an area. Rooted in the research of Putnam (1993, 2000) and others (such as Bourdieu, 1993 and Coleman, 1988), studies show that core elements of social capital—particularly the presence of a rich stock of social networks and sets of norms that govern the relationships among these networks—enhance the capacity of communities to act on issues of local importance (Schuller, 2001). Social capital is the “glue” that holds societies together and whose presence can spur the type of economic growth that brings benefits to the entire community (Grootaert, 1998; Putnam, 1993). In essence, it serves as a set of social resources that communities can tap when tackling local economic problems (Glaeser, 2001).

In areas suffering from economic distress, measuring the state of social capital present in these localities may be a path well worth exploring. Simply put, in communities where good things are happening across the spectrum – in education, in job creation, in health care, in community services – a broad-based corps of civic-minded people and organizations is often in place to undergird these important activities (Woolcock, 2001). As Putnam (1993) notes, “Working together is easier in a community blessed with a substantial stock of social capital.” Thus, in the

context of forward-thinking strategies, taking stock of the social capital attributes of a county or place may offer some important insights regarding the future capacity of ARC counties (particularly those suffering for economic distress) to undertake collective action on their major socioeconomic challenges.

Social capital represents a multi-dimensional concept. It consists of “bonding” and “bridging” activities that occur within the local community setting, as well as “linkages” that tie community members to organizations and resources existing outside the community (what we commonly refer to as vertical ties). Bonding represents the strong interactions and intimate ties that people have with family, friends, neighbors, and close work associates. Bridging reflects the horizontal ties that individuals have with people and groups within the community with whom they have only limited interactions (Flora et al., 2008; Putnam, 2000). These constitute what Granovetter (1973) labels as “weak ties” that can be accessed in times of need. The third element, vertical linkages, offers an avenue for local people, organizations and communities to gain access to valuable resources and ideas from outside the community that can be used to support and guide local initiatives. According to Woolcock (2001), the presence of various combinations of bonding, bridging, and linking social capital shapes the range of social and economic outcomes that are possible in communities. As such, these interactions help build trust and create the social assets that can be tapped for future community endeavors (Putnam, 2002).

If social capital is to be viewed as a viable tool that the ARC might consider for discriminating among counties that are best or least positioned to “act” on local economic and social challenges, then it is critical that sound measures of social capital be identified. Measuring bonding, bridging, and vertical relations, or assessing levels of trust or existing norms in communities, cannot be easily achieved without engaging in costly and time consuming qualitative data collection activities (Haezwindt, 2003). We would propose the use of a series of quantitative measures that have been found to be important corollaries of civic-minded communities or that contribute to the development of trusting relationships. Most important, they represent variables that are readily available at the county level.

Table 5.3 outlines 10 key variables identified in the research literature as viable proxies for social capital. For sake of clarity, we classify these variables into four major themes – all of which are associated in some way with the strengthening (or weakening) of social capital in a local area. Variables listed under *community attachment* represent factors that help people feel “rooted” in their communities. Voting represents active *participation in the political process*. The *social/civic activeness* of a locality is captured by the density of local organizations existing in the area. Age and education are included in the “social and civic participation” category as well since both give shape to the civic activeness of local residents. Finally, we propose four variables to assess the level of social cohesion/integration present in the community.

Table 5.3: Ten Quantitative Measures of Social Capital

Variables	Contribution to Social Capital	Data Source
<i>Community Attachment</i>		
Home Ownership	<ul style="list-style-type: none"> ▪ Increases membership in local organizations, voting participation, social trust 	Decennial Census ACS after 2010
Length of Residence	<ul style="list-style-type: none"> ▪ Improves the strength and breadth of social networks, increases chances of being civically involved and engaged in local organizations 	Decennial Census ACS after 2010
<i>Political Participation</i>		
Voting Participation	<ul style="list-style-type: none"> ▪ Increases awareness of political affairs ▪ Builds citizenship 	County and City Data Book (2004)
<i>Social and Civic Participation</i>		
Associational/Nonprofit Organizations	<ul style="list-style-type: none"> ▪ Builds horizontal ties across the community (i.e., expands connections and access to resources) ▪ Enhances communication and sharing of information ▪ Facilitates cooperation and collective action on local issues 	County Business Patterns (2005) and National Center for Charitable Statistics (2007)
Years of schooling	<ul style="list-style-type: none"> ▪ Higher educational levels increase trust and community involvement 	Decennial Census ACS after 2010
Age	<ul style="list-style-type: none"> ▪ Networks and relationships increase with age (until one surpasses age 60) ▪ Social trust increases with age ▪ Persons 30 and above are more likely to be involved in their communities 	Decennial Census and U.S. Census Bureau's Population Estimates (2006) ACS after 2010
<i>Social Integration</i>		
Marital Status	<ul style="list-style-type: none"> ▪ Married persons are more trusting, more likely to provide social support to neighbors ▪ Single persons are less likely to be civically active 	Decennial Census ACS after 2010
Immigration/Ethnic Diversity	<ul style="list-style-type: none"> ▪ Immigration reduces community cohesion on the short term 	Decennial Census and U.S. Census Bureau's

	<ul style="list-style-type: none"> ▪ Ethnic diversity weakens social trust and results in lower political, social and civic participation 	Population Estimates (2006) ACS after 2010
Income Inequality	<ul style="list-style-type: none"> ▪ Inhibits the development of social trust ▪ Lowers involvement in local organizations 	Decennial Census and American Community Survey after 2010
Residential Mobility	<ul style="list-style-type: none"> ▪ Disrupts the relationships/ties that individuals have with local people and organizations ▪ Reduces membership in local organizations 	Decennial Census ACS after 2010

Table 5.3: Ten Quantitative Measures of Social Capital—cont.

Summary Evaluation: Social capital-type measures should be given scrutiny for future use at least as secondary or adjunct indicators of distress. The items could be examined as a series of independent factors, or a smaller set of indices (if appropriate), to assess how well they correlate with economic conditions in the ARC counties. While not perfect measures of social capital, the items described in Table 5.3 could be worth exploring with regard to their links to future economic distress.

5.3. Regional and Sub-County Distress Measures

5.3.1. Multi-County Level Geographies

A common feature of economic (and social) distress is that it tends to cluster into groups of contiguous counties and neighborhoods (Glasmeier et al., 2003; Partridge and Rickman, 2005; Rupasingha et al., 2002; Miller and Weber, 2004). For example, poverty rates are highest at the cores of county-level clusters in Appalachia, the historic Cotton belt, and the Mississippi Delta, and then taper off gradually towards the edge of the clusters (Partridge and Rickman, 2007).

The ARC could develop more sophisticated statistical approaches to assess distress and for economic development planning. One approach is standard spatial econometric methods (Anselin, 1988) and more descriptive approaches such as Moran’s I and geographically weighted (or distance-weighted) approaches (Fotheringham et al., 2002).²⁶ One advantage of these approaches is that they could formally account for the interdependence between neighboring counties. For example, economic distress manifested through a weak labor market in nearby counties may have spillover impacts on the county of interest. Another advantage is that they lend themselves quite well to GIS mapping and can be visually presented in a friendly way. Nonetheless, a clear shortcoming is that the current ARC staff is not sufficiently large to conduct this analysis on a widespread basis.

²⁶Geographically-weighted approaches would calculate the average of a particular indicator (such as the poverty rate) within a set distance of the county (e.g., within 100 miles). These statistics can then be mapped to illustrate the clustering in a visually appealing, transparent way.

Summary Evaluation: There are many potential uses of indicators that would tap clustering of distress among counties or sub-regions within the greater ARC region, but the construction of these indicators would have to be weighed against the need for additional resources.

5.3.2. Sub-County Indicators

It is conceptually easy to construct sub-county-level measures of distress—e.g., at the census tract level. Indeed, the ARC staff has produced distress measures at this level in the last few years. The practical problem is that it has been historically challenging to develop sub-county distress measures because most of these data have only been reported in the decennial Census. For this reason, as the decade moves forward, the ARC’s census tract measures tend to be more out-dated than their county-level counterparts. Some current exceptions to these data constraints include inter-census estimates of population and place-of-work employment indicators linked to establishment zip code (which are subject to confidentiality restrictions and are sometimes hard to reconcile to census tracts). Yet, the ACS’s expansion in 2010 will allow more annual sub-county analysis at the tract level or finer—though with the caveat that the ACS’s accuracy will not be perfect.

Nevertheless, aside from issues of accuracy, before sub-county indicators of distress are widely used for funding allocations, there are the following conceptual and policy questions: (1) In the midst of an otherwise vibrant county, when does a cluster of “distressed” census tracts reach the critical mass such that they warrant further attention? (2) Do these proportions differ across “At Risk” counties and counties that are “Transitional?” (3) Some measures such as population change have very little meaning when discussing a neighborhood (census tract)—i.e., what does it mean if a census tract had out-migration when it is undergoing industrial or commercial development. (4) Does it make sense for ARC to be concerned with sub-county outcomes given its history as more of a *regional* economic development authority? Do sub-county issues fall more into the purview of other state and federal agencies such as EDA or Housing and Urban Development?

Summary Evaluation: We recommend that the ARC engage in more research and stakeholder discussion before utilizing sub-county distress indicators for planning and funding allocations. In the meantime, the current ARC approach of presenting sub-county measures of distress is wise for planning purposes.

5.4. New Federal Data Sources: Offering Expanded Assessment of Current Conditions

Throughout this report, we have recommended that the ARC consider new variables and data sources in measuring economic distress and in their planning. In particular, there are three federal surveys that we believe have the most potential for providing expanded assessments of current and future conditions.

The U.S. Census Bureau’s annual *American Community Survey* (ACS) will increasingly be a source of data at the county and sub-county levels. In 2008, the ACS will report three-year

averages (2005 to 2007) for all counties with greater than 20,000 population. Beginning in 2010, it will report five-year averages for all counties and sub-counties (U.S. Census Bureau, 2006). The ACS is a rich source of data comparable to the decennial Census (which it will replace in terms of detailed local information). We are increasingly convinced that the ACS will provide relatively accurate measures that will be annually updated (with a very short lag into the following year). However, for smaller counties and for sub-counties, it will be based on five-year moving averages, meaning that it will not be perfectly up-to-date.²⁷ Yet, given that the ACS generally reports demographic data that more slowly change over time, a five-year moving average should be relatively accurate at the scale of a county (though it may not pick up dramatic changes at the census-tract level).

Summary Evaluation. As described earlier in the report, the ACS may prove to be an invaluable source for constructing future measures of distress.

Second, the *Longitudinal Employer-Household Dynamic (LEHD)* data set maintained by the U.S. Census Bureau has tremendous potential as a major source for both current and forward-looking indicators of distress.²⁸ Several forward-looking indicators can be obtained such as the overall number of new hires; number of new-hires into “stable” longer-lasting jobs; recent layoffs; and labor market turnover of hiring, quits, and layoffs. Even the average wages of all current employees and newly-hired employees are available. LEHD is currently publicly available at the county level with about a one-year lag. It also provides detailed assessments by gender on over 21 different industries and 8 different age groups.

One disadvantage is that only 11 of the ARC region’s 13 states participate in the LEHD program (as of December 17, 2007, New York and Ohio data are not reported). Fortunately, though not as rich as the LEHD data, the U.S. Department of Labor’s ES-202 data can potentially fill in some of the holes in non-participating ARC states, especially regarding wages and detailed employment conditions by industry. Yet, probably the key disadvantage of the LEHD data is that there are significant disclosure issues in less populated counties for particular industries, meaning that much of the detailed data is unavailable. There still would be some scope of filling in some of this data from private vendors such as EMSI or REMI.

Summary Evaluation: The ARC could utilize LEHD data as a timely indicator of counties that are experiencing significant upswings in hiring or in layoffs to provide an early signal/warning of fundamental change. Yet, given that the ARC’s distress indicators have generally been structural or persistent measures of economic degradation, it is not clear how the ARC could incorporate LEHD data into a current distress index, although an ongoing pattern of layoffs could be a future indicator of structural distress. One drawback with using LEHD data is that there is not a long history of having such data at the county level, so it is not clear what shifts the data are tapping. There would need to be research as to how to use the data and more time devoted to learning about its long-term implications.

²⁷The ACS will use single-year estimates for locations with more than 65,000 people, three-year moving estimates for locations with more than 20,000 people, and five-year estimates for less-populated geographies (U.S. Census Bureau, 2006).

²⁸For more details, see the LEHD website at: <http://lehd.did.census.gov/led/index.html>.

Third, when data on place-to-place migration flows were described above, we noted that the *IRS county-to-county migration data* could also be employed in constructing annual measures of migration. The IRS data could be utilized to assess the origin and destination of a particular county's migrants. For example, are out-migrants staying in the nearby region or are they leaving the region for other locations? Such data could be invaluable for policymakers trying to assess the underlying local dynamics and in their design of mitigating policies. In particular, it may help in designing regional or multi-county approaches for alleviating pockets of distress.

Summary Evaluation: The IRS migration data *may* prove to be a useful supporting tool for ARC's planning with local partners.