PROFILES OF POOR COUNTIES: SOME EMPIRICAL EVIDENCE

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Abstract

What are the relationships between poverty and the stereotypes of poor areas? Do Census Bureau estimates of poverty in counties fit what we think about such places? These answers — in figures and graphs — help to profile poverty in US counties. The first section of this paper introduces the topic of poverty measurement, the second section describes the comparison data, the third section provides some generalities from the results, some expected, and some unexpected. The conclusion summarizes poverty profiles.

1. Introduction

People tend to think of poor areas as either remote, sparsely populated rural places, with ethnically homogeneous groups ekeing out a living from the land, or as crowded inner cities where people suffer from crime, low earnings and unemployment. These places lack economic opportunities, and are not attractive places for settling down. Are such characterizations empirically valid? Given poverty measures, do simple relationships uphold or refute prior conceptions of poor areas?

The Census Bureau's Small Area Estimates program produces biennial estimates of poor people at the state, county and school-district level; this paper concentrates on the county-level estimates of the total number of poor for income years 1989, 1993, and 1995.[2] The Census Bureau bases its estimates on data from the March Supplement of the Current Population Survey (CPS), the decennial census, and other administrative data. A county is poor if more than 20 percent of its population is below the poverty level.

The official definition and measurement of "poverty" have conceptual problems. The National Academy of Sciences Panel on Poverty and Family Assistance (Citro and Michael, 1995) proposes a different indicator to address the numerous shortcomings of the current measure. Short et. al. (1999) provides the best application of the Panel's recommendations to date. Other components of poverty experience, however — education, health status, physical and mental disabilities, discrimination against minorities and women — defy adequate quantification. No attempt will be made here to explain the dynamic nature of poverty. For such treatments the reader is referred to the "capability" of families to escape poverty (Sen, 1997), or to "self-reliance poverty" based on earnings capacity (Haveman and Bershadker, 1998). Conceptual difficulties and differences in universe controls discourage rigorous statistical comparison over time.[3] While the effect of the 1997 Welfare Reform Act will be widespread, it is not relevant to this discussion.

Despite the above limitations, poverty ratios — poor people divided by the population for a given area — can act as baselines for comparison over time and space. We can compare them with other county-level data. The resulting correlations (in patterns or pictures, not hypotheses tests of distribution parameters[4]) help to model effects, and may even reinforce or refute stereotypes of poor areas: places persistently lacking economic vitality, with high unemployment and high crime, racially homogeneous and relatively immobile populations.

In the figures the y-axis is fixed as the poverty ratio in the 3000+ US counties. The x-axis is just a category or a percentile (quantile, decile). When comparing people, the formula for aggregation is the ratio of the sums rather than the average of the ratios.[5] The correlates are static indicators only, important more for prediction than explanation: measures of location, size of population, dominant type of economic activity, poverty experience,

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[1] This paper reports the results of research and analysis undertaken by Census Bureau Staff. It has undergone a more limited review than official Census Bureau publications. This report is released to inform interested parties of research and to encourage discussion.

[2] See Siegel (1995) and Fisher (1997).

[3] Fisher (1999) approximates correlations for hypothesis tests over time.

[4] A note on comparing estimates across space is available from the author.

[5] That is, we form estimates of the *poverty ratio for people in counties* in that class. For counties, on the other hand, the ratio is the *average poverty ratio* for counties in that class. The crime index, unemployment rate, and net migration rate use the latter formula.

size of minority populations, crime, unemployment and earnings, and migration.

2. More about the Comparison Data

Potential data sources provide good comparison data if a) totals are usually aggregated at the county level, b) data are available for 1989, 1993 and 1995 and c) county ID codes are unique to allow a near-complete match of county boundaries. Each county can be placed into a population size class and Census Division, and can be categorized into a Percent Black and Percent Hispanic quantile. These county classes come directly from the 1990 Census of Population (Census Bureau, 1993).

Cook and Mizer's (1994) update of the Economic Research Service's (ERS) typology of rural counties in the US exhaustively classifies nonmetropolitan (rural) counties by predominant economic activity. 76% of counties are nonmetropolitan. A county's principal economic activity (farming, mining, manufacturing, or government services) depends on how much the activity contributed to labor and owner income for 1987-1989. We also use the Beale (1993) classification of counties as "persistently poor": 20% or more of the population below the poverty threshold in *each* of the four censuses, 1960, 1970, 1980, and 1990.

The Uniform Crime Reporting Program (UCR, US Department of Justice, 1995, 1997, 1997a) is the source for crime data in counties. Their "modified crime index" is the count of crimes, including murders, forcible rapes, robberies, aggravated assaults, burglaries, larcenies, motor vehicle thefts and arsons. This was the only prevalence statistic with a large enough range to draw distinctions among counties on the basis of crime.[6]

Data on county unemployment rates come from the Local Area Unemployment Statistics (LAUS) program of the Bureau of Labor Statistics (BLS, 1999a). Since LAUS data are not available before 1990, the 1990 county unemployment rates are compared with 1989 poverty ratios, whereas the 1993 and 1995 unemployment rates are used for the 1993 and 1995 poverty ratios.[7]

Data on average earnings per job data are from the Bureau of Economic Analysis (1998a, 1998b). This measure is the sum of employees' earnings and proprietors' incomes divided by the total number of jobs. Because it is not adjusted for full-time equivalence, the variation in this measure among counties reflects in part the variation of part-time job holding and the variation in the number of hours worked in both full-time and part-time jobs.

The net migration rate (Sater, 1995) summarizes the mobility of county residents. This rate is

$$[\,(I - O) \div (O + N)\,] \times 100$$

where I, O and N are the annual number of in-migrants, out-migrants and non-migrants, respectively. The rates come from IRS tax returns matched from one year to the next, then averaged. These are compared with poverty ratios two years prior, on the assumption that households respond to economic incentives to stay or move with a time lag.

3. Results

Simple correlations between poverty and other indicators require, but for a caution about measurement error, little qualification. Adding a third dimension, time, invites faulty inference when conditions change. In any event, some empirical conclusions about poverty ratios across space and over time provide valuable intelligence for modeling, measuring, aggregating, and comparing.

The official US poverty rate[8] was 12.8% in 1989, 15.1% in 1993, and 13.8% in 1995 (Census Bureau, 1999).

Figure 1 shows poverty ratios by Census Division (Census Bureau, 1995). The East South Central division is poorest and New England is relatively well off. All divisions witnessed an increase in poverty in the first half of the decade except for the West South Central Division. Consistent with Vias (1999), the highest net in-migration attended a large secular increase in poverty in the Mountain states (AZ, CO, ID, MT, NV, NM, UT, WY) from 1989 to 1993.

Figure 2 shows that poverty initially rises across the first two population size classes, falls with rising county population size class, then turns up again in the largest counties.[9] Some of the smallest and poorest counties in the country are found in Appalachia, the Mississippi Delta, the Texas-Mexico border, and Native American

[6] The shortcomings of such a simplified additive index are well known — all crimes should not be given equal weight.

[7] This mismatch should not greatly affect the trend because county unemployment rates are reasonably stable over time.

[8] Rates differ from ratios. Rates are numbers of poor divided by the "poverty universe," which excludes the institutionalized population and foster children.

[9] Note from the counts that 72% of the population falls into the first three county size classes.

lands. The high-population poor counties are conurbations. Poverty differences over time are larger for the larger size classes; these counties are fewer, perhaps less homogeneous. Let a dummy variable equal one if the county is nonmetropolitan. Then ruralness and poverty coincide: regression coefficients are highly significant and positive (t = 16.837, 13.774, and 15.825 for 1989, 1993, and 1995, respectively). This picture masks the city/suburb dichotomy, however. Central city poverty has been more than double that of suburbs since 1970: 19% in 1990 and 20.6% in 1995 versus 8.7% and 9.1%, respectively (Census Bureau, 1998).

Figure 3 concentrates on rural poverty by the ERS typology. Non-Specialized counties are those for which no obvious primary economic activity exists. Economic returns from farming and mining are much lower than from services and manufacturing. From 1989 to 1995, national average hourly earnings (employee-weighted) in mining and agriculture rose .5% per annum, while that in manufacturing and services rose 4.88% per annum.[10] Government counties are poorer than might be expected, but three-quarters of those jobs are state or local government. (In metropolitan counties the derived poverty ratio fell slightly from 1993 to 1995.)

Poverty is entrenched and persistent in some places. Among the 608 counties with poverty ratios of 20% or more in 1989, 554 (91%) were "persistently poor" (see definition previous page). Similarly, 90% of the 650 counties with poverty ratios 20+% in 1995 were "persistently poor." A county's likelihood of having a poverty ratio over 20% in 1995 if it was "persistently poor" in 1990 was 80%. On the other hand, 91% of counties not labeled "persistently poor" in 1990 maintained their poverty ratios below 20% through 1995. Figure 4 shows the three ratios against the 1980 poverty ratios grouped by quintiles of people (the smoothness of the lines is cosmetic only), and it is clear that conditions in poor areas have not improved significantly over time.

Figures 5 and 6 compare poverty ratios with the percentage of Black and Hispanic residents, respectively.[11] Percent Hispanic and Percent Black were only measured one time, in the 1990 census, so the same counties are always in the same place on the abscissa. For counties having at least 3.2% Black populations — the figures portray only about 1200 counties — Spearman correlations of the county poverty ratio on percentage Black are .50, .49, and .48 for the three years (all statistically significant with $p > .99$). Poverty rises with rising proportions of Black residents mainly through the upper half of this marginal distribution. For Hispanic counties (at least 1.2% Hispanic), the correlations are .30, .33, and .32 ($p > .99$). The weak positive relationship between a county's Hispanic percentage and its poverty ratio is not obvious from Figure 6. It is impossible to infer much more without controlling for other potential correlates, such as education, the presence of other ethnic groups, or variations within ethnic groups (e.g., Hispanics by country of origin).

Poverty can be associated with crime empirically using the Modified UCR Index, but the association requires a very loose definition of "crime." Population weights the index, and larceny, burglary and motor vehicle theft account for 85-90% of its value (using murder alone as a metric would result in too many missing counties). Figure 7 displays poverty ratios for 3 years plotted with the first nine deciles[12] of a 3-year average of the Crime Index on the x-axis. For example, 60% of the counties had an index value below 3% for all years. Rising poverty is associated with lower crime because the index is strongly weighted to theft. Indeed, Spearman correlations between the poverty ratios and the property theft crimes are negative (and, except for burglary and the 1993 poverty ratio, are all statistically significant with $p > .99$). Both property theft and violent crime are negatively associated with rural areas, *ceteris paribus* (regression coefficient t statistics = 20.327, 13.129, respectively). Population density is obviously an important factor with regard to all crimes: Spearman correlations of the Index with population per square mile in 1990 are .75, .67, and .68 (with $p > .99$). Be careful before concluding that theft is less likely in poor areas because there is less to steal: the quality of the crime data is generally poor, with much underreporting and inconsistent reporting among jurisdictions.

Figure 8 plots poverty ratios against county unemployment rates. First, deciles are made of the BLS/LAUS rates for each year. These deciles are then 3-year-averaged. Poverty rises near-monotonically with unemployment. It is reasonable that this should be verified empirically, but the closeness of the points over time reinforces the notion of poverty persistance.

Figure 9 emphasizes that average earnings of poor people

[10] Not seasonally adjusted, BLS (1999b). Source for agriculture: National Agriculture Statistics Service, Office of the Chief Economist.

[11] Please note that the Black population contains both Hispanics and non-Hispanics, and that Hispanics can be of any race.

[12] Points are deciles at (for simplicity) a maximum of 90%. All cases below the 10% cutoff point are 0.0 for 1993 and 1995.

are lower in the poorer counties. This is actually a falsely optimistic picture using place-of-work series. The BEA average earnings per job is biased upward in counties where cities act as commuting destinations of the professional labor force. Where place-of-work earnings produce correlations in the range of -.27 to -.41 ($p > .99$), place-of-residence data (per capita personal income series) produce stronger negative correlations, -.63 to -.75 ($p > .99$).

Coping strategies of the poor at the margins are necessarily flexible in the absence of stable, full-time work with standard hours and adequate benefits. Many of the poor cycle on and off low paying jobs, typically making less than $7.00 per hour (National Association of Community Action Agencies (NACAA), 1999). The overwhelming response of communities surveyed for the 1996 National Dialogue on Poverty cited "increased numbers of full-time jobs with wages adequate to support the individual and offering health insurance and other benefits" as the top priority outcome (NACAA, 1999).

Figure 10 shows poverty against the flow of the population as measured by net county migration. Net migration is on the x-axis (see formula on p. 2). Net in-migration is to the right of the 0.0% point on the x-axis. Rich counties appear to gain people, poor counties to lose people. What happens in consequence is not clear. We cannot be sure *how* the rich or the poor respond to relative economic opportunity, only that the flows are consistent with the idea that poverty repels and opportunity attracts. We cannot tell *who* moves in the figure. Nord (1998) suggests that the migration patterns of the poor reinforce and maintain the spatial concentration of poverty — the poor live in places where they can "survive but not thrive." Figure 10 seems to suggest much more movement out.

4. Conclusion

The results challenge three stereotypes about poor areas — large populations of minorities, high crime, and low mobility. The relatively small subsets of concentrated Black populations are poverty prone, but omitted influences (school completion rates, perhaps) confound the interpretation. The relationship is weaker for the relevant Hispanic population. More reported crime certainly does not attend higher poverty, and poor rural counties have less theft and violent crime than do counties in the denser, less poor, metropolitan areas. Highest poverty places are associated with the highest out-migrations, and vice-versa. In other respects the empirical relationships support prior expectations about poorer counties: they are small and rural, they have been poor a long time, they have higher than average unemployment and lower than average earnings.

References

Beale, Calvin (1993), "Poverty is Persistent in Some Rural Areas," *Agricultural Outlook AO-200*, September.

Bureau of Economic Analysis (1998a) "County personal income, per capita personal income, and population, 1969-96" http://www.bea.doc.gov /bea/regional/data.htm.

Bureau of Economic Analysis (1998b) "County and MSA total wage and salary disbursements, total wage employment, and average wages, 1969-1997" http://www.bea.doc.gov/bea/regional/reis/ca34/index.htm.

Bureau of Labor Statistics (1999) "Local Area Unemployment Statistics," http://www.bls.gov /lauhome.htm.

Bureau of Labor Statistics (1999b) "Current Employment Survey," http://www.bls.gov/ ceshome.htm.

Census Bureau (1993), *1990 Census of Population, Social and Economic Characteristics for Various States (1990 CP-2-various)*, Appendix C, US Government Printing Office, Washington, D.C.

Census Bureau (1995), "Poverty Areas", *Statistical Brief*, http://www.census.gov/socdemo/www/ povarea.html.

Census Bureau (1998), "Poverty in the United States: 1997," *Current Population Reports*, Series P60-201, US Government Printing Office, Washington, DC.

Census Bureau (1999) "Small Area Income and Poverty Estimates, Tables for States and Counties by Income Year and Statistic," http://www. census.gov/ hhes/www/poverty.html.

Citro, Constance F., and Michael, Robert T., eds. (1995), *Measuring Poverty: A New Approach*. Washington, D.C.: National Academy Press.

Cook, Peggy J. And Mizer, Karen L. (1994), "The Revised ERS Typology: An Overview", Rural Economy Division, Economic Research Service, US Department of Agriculture. Rural Development Research Report 89.

Fisher, Robin (1997), "Methods Used for Small Area Poverty and Income Estimation," *Proceedings of the American Statistical Association, Section on Government Statistics and Section on Social Statistics*, 177-182.

Fisher, Robin (1999), "Crude Correlations for Differences Between 93 and 95," unpublished mimeo.

Haveman, Robert and Bershadker, Andrew (1998), "Inability to be Self-Reliant as an Indicator of US Poverty: Measurement, Comparisons, and Implications," Department of Economics, University of Wisconsin-Madison, Working Paper No. 247.

National Association of Community Action Agencies (NACAA) (1999), "National Dialogue on Poverty: What Does America Want? Report on Local Dialogues on Poverty," http://www.nacaa.org/NDPSEC3.HTM.

Nord, Mark (1998), "Poor People on the Move: County-to-County Migration and the Spatial Concentration of Poverty," *Journal of Regional Science*, Vol. 38, No. 2, pp. 329-351.

Sater, Douglas (1995), "Differences in Location of Household and Tax Filing Units," unpublished mimeo.

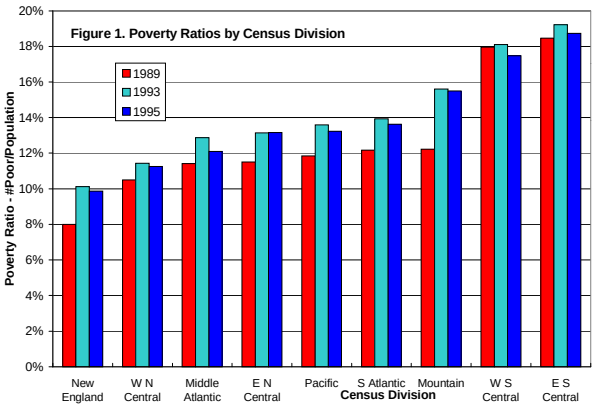
Sen, Amartya (1997), *On Economic Inequality*. Oxford: Clarendon Press.

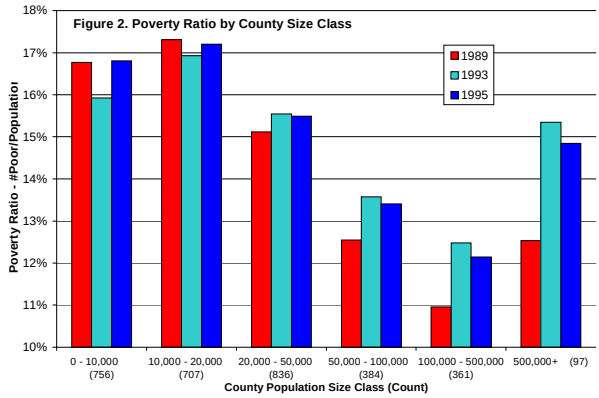
Short, Kathleen, Shea, Martina, Johnson, David, and Garner, Thesia I. (1999), "Experimental Poverty Measures," *Current Population Reports*, P60-205.

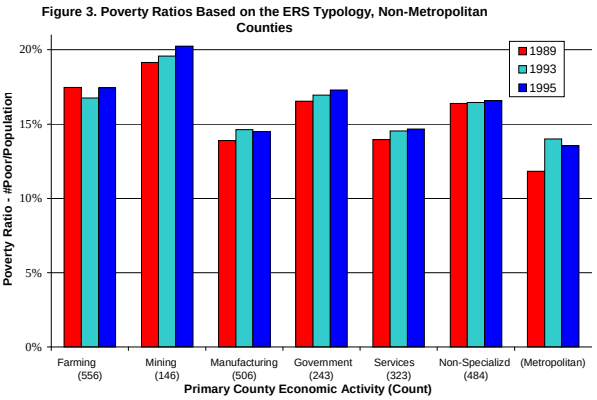
Siegel, Paul M. (1995), "Developing Postcensal Income and Poverty Estimates for All US Counties," *Proceedings of the American Statistical Association, Section on Government Statistics and Section on Social Statistics*, pp. 154-171.

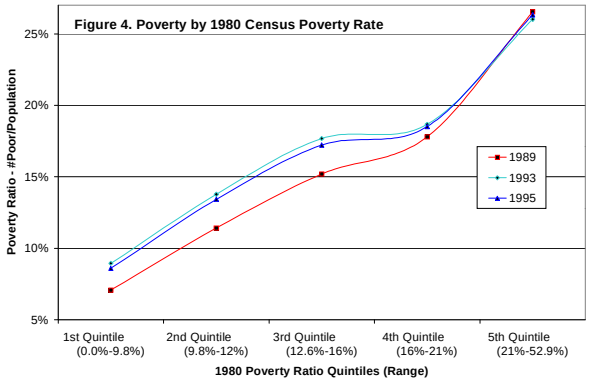
US Dept. of Justice (1995, 1997, 1997a), Federal Bureau of Investigation. Uniform Crime Reporting Program Data [United States]: County-Level Detailed Arrest and Offense Data, 1993, 1989, 1995 [Computer file 6545, 9573, 6850]. ICPSR ed. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [producer and distributor].

Vias, Alexander C. (1999), "An Analysis of Population and Employment Growth in the Nonmetropolitan Rocky Mountain West, 1970-1995," unpublished mimeo.









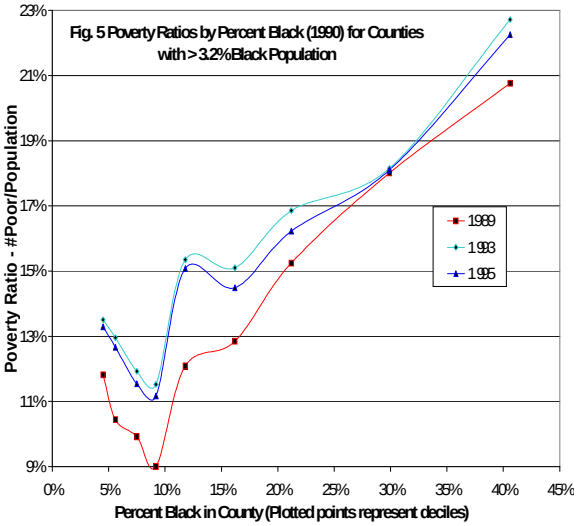


Fig. 5 Poverty Ratios by Percent Black (1990) for Counties with > 3.2% Black Population
Poverty Ratio - #Poor/Population
23%
21%
19%
17%
15%
13%
11%
9%
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
1989
1993
1995
Percent Black in County (Plotted points represent deciles)

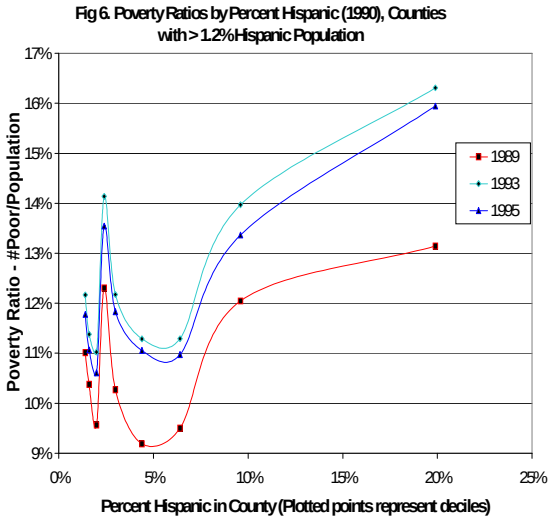


Fig 6. Poverty Ratios by Percent Hispanic (1990), Counties with > 1.2% Hispanic Population
Poverty Ratio - #Poor/Population
17%
16%
15%
14%
13%
12%
11%
10%
9%
0%
5%
10%
15%
20%
25%
1989
1993
1995
Percent Hispanic in County (Plotted points represent deciles)

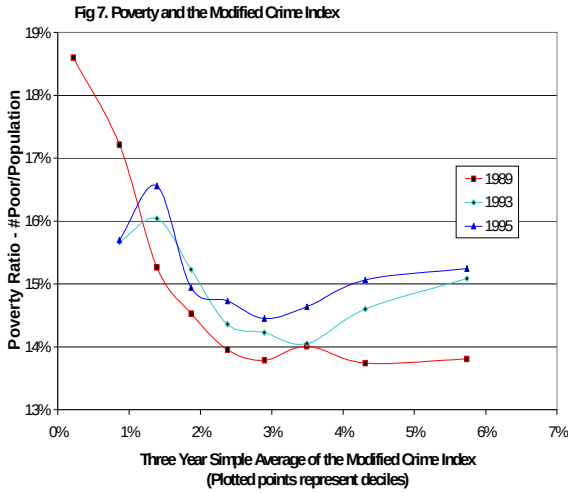


Fig 7. Poverty and the Modified Crime Index
Poverty Ratio - #Poor/Population
19%
18%
17%
16%
15%
14%
13%
0%
1%
2%
3%
4%
5%
6%
7%
1989
1993
1995
Three Year Simple Average of the Modified Crime Index
(Plotted points represent deciles)

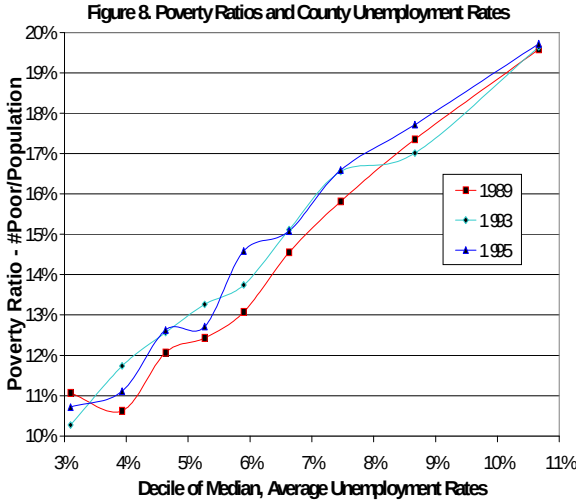


Figure 8. Poverty Ratios and County Unemployment Rates
Poverty Ratio - #Poor/Population
20%
19%
18%
17%
16%
15%
14%
13%
12%
11%
10%
3%
4%
5%
6%
7%
8%
9%
10%
11%
1989
1993
1995
Decile of Median, Average Unemployment Rates

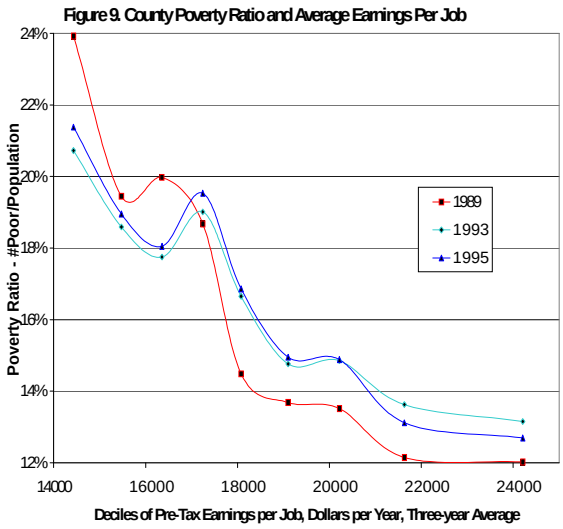


Figure 9. County Poverty Ratio and Average Earnings Per Job
Poverty Ratio - #Poor/Population
24%
22%
20%
18%
16%
14%
12%
14000
16000
18000
20000
22000
24000
1989
1993
1995
Deciles of Pre-Tax Earnings per Job, Dollars per Year, Three-year Average

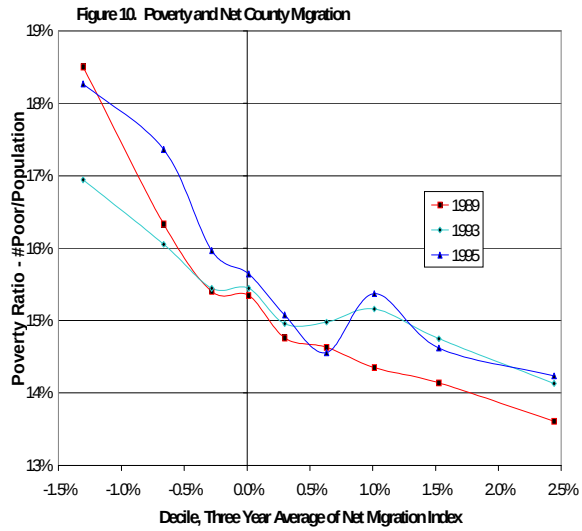


Figure 10. Poverty and Net County Migration
Poverty Ratio - #Poor/Population
19%
18%
17%
16%
15%
14%
13%
-1.5%
-1.0%
-0.5%
0.0%
0.5%
1.0%
1.5%
2.0%
2.5%
1989
1993
1995
Decile, Three Year Average of Net Migration Index