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**Poverty in Metropolitan Areas of the U.S.: Causes and Consequences**

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**Abstract:**

This paper re-examines the determinants of poverty using a pooled data set of 331 U.S. Metropolitan Statistical Areas (MSAs) measured over four decennial censuses from 1970 to 2000. Our principal conclusions are that the determinants of poverty that we have identified are relatively stable predictors of poverty levels, but that results for first differences are sensitive to the time period of estimation. We also examine whether poverty as an initial condition has an effect on future growth in incomes and/or employment, and our tentative conclusion is that a higher level of existing poverty is indeed a detriment to future growth.

**JEL Codes:** E32, I32

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# Poverty in Metropolitan Areas of the U.S.: Causes and Consequences\*

by

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## Poverty in Metropolitan Areas of the U.S.: Causes and Consequences

“The poor you have with you always” *Christian Bible*

“If a free society cannot help the many who are poor, it cannot save the few who are rich.”

*John F. Kennedy*

### I. Introduction

It has been forty years since the War on Poverty was declared by Lyndon B. Johnson, acting on an initiative originally suggested by Walter Heller, then Chairman of the Council of Economic Advisers, to Johnson’s predecessor, John F. Kennedy (Bauer, 1982). New programs promoting literacy, health, job training, and income maintenance would be combined with general prosperity and continued growth in incomes to lift the disadvantaged from the underclass and into the mainstream of society. Like many wars declared against social problems, however, victory which seemed so certain at the outset has proved most elusive in practice.

To be sure, initial results were encouraging. National poverty rates were halved between 1960 and 1973, reaching an all-time low in that latter year of 11.1 percent. Since that time, however, poverty rates have fluctuated in a range between 11 and 15 percent, despite a 60 percent increase in inflation adjusted per capita incomes, and despite the fact that the poverty line is defined as an absolute (albeit inflation-adjusted), not a relative, income.<sup>1</sup> In the year 2001, the last year for available official data, the poverty rate was 11.7 percent, notwithstanding the decade-long expansion that had just ended.

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<sup>1</sup>The national poverty threshold was first established by Mollie Orshansky of the Social Security Administration in the 1960s as roughly three times the cost of an

There are ameliorating factors to the otherwise disappointing record. By other measures, particularly those that emphasize consumption rather than income, those in the lower levels of the income distribution are faring much better than their predecessors of a generation ago. Still, to have one in every nine individuals in a country as rich as the U.S. classified as living in poverty, after forty years of programs and forty years of economic growth, remains a problem calling for further analysis.

Furthermore, poverty is not only persistent in time, it is persistent in place. Figure 1 presents scatterplots at ten-year intervals and for the entire period of poverty rates for 331 Metropolitan Statistical Areas (MSAs) compiled by the U.S. Bureau of the Census for the decennial censuses of 1970, 1980, 1990, and 2000.<sup>2</sup> These plots are evidence that poverty can become quite entrenched in locations, especially in the medium term of ten years.<sup>3</sup> Still, there is some movement in poverty rates over the longer term, and part of our purpose in this paper is explore the factors responsible for the evolution of poverty across MSAs during the sample period.

[Figure 1 about here]

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economy food plan, as food was estimated to be one-third of the after-tax expenditures of a poor family (Short, 2001a). Since that time, the poverty level has been adjusted by changes in the consumer price index, so that it is always reported in current dollars. For example, a family of four with two children would be in poverty in 2001 if the family income fell below \$17,900 (U.S. Census Bureau, 2003b)

<sup>2</sup>MSAs are one or more Metropolitan Areas (MAs), which are defined as large population nuclei, usually over 50,000 population, that include surrounding non-metropolitan counties and are separate from other MAs (U.S. Bureau of the Census, 2003a).

<sup>3</sup>The three outliers in each plot are Brownsville, Laredo, and McAllen, Texas, all in the extreme southern region of the state, and all characterized by high rates of recent immigration and a mostly agrarian economic base. Omitting these outliers results in  $R^2$  about 0.10 less in each case

We choose MSAs because of the rich trove of data available, and because each person in an MSA has access to a metropolitan area of at least 50,000, and therefore to a relatively diverse economic base. MSAs account for 80 percent of the national population, but relatively fewer of the poverty population, with rates in MSAs about 25 percent lower than in rural areas. Levernier (2003) finds that differences in poverty rates between metropolitan and non-metropolitan areas are largely accounted for by educational differences and labor force participation rates. We show below that these factors are also important in explaining differences in poverty rates within metropolitan areas, but we go beyond this by showing how these relationships change over time.

We address three questions regarding poverty:

1. What determines poverty levels? As shown below, poverty rates differ across regions of the U.S., and are persistent over time. It is, of course, something of a tautology to say that regions with lower incomes have higher poverty rates, so the analysis in this paper will consider underlying factors such as education levels and minority status in explaining poverty.
2. What determines changes in poverty rates over time? Poverty rates are not perfectly stable; the average standard deviation of the poverty rates over the four decennial censuses for the 331 MSA's is about two percent, and many areas, particularly in the South, have seen notable declines. It would clearly be useful to know which factors have been associated with the evolution of poverty, so that policies aimed at poverty reduction can be focused appropriately. Further, given the structure of our data into pooled

cross sections of four decennial censuses, we can test whether the components of poverty change have been constant over time.

3. What are the ramifications of poverty rates for economic performance? Do higher poverty rates mean lower growth in employment and/or income? Obviously, poverty is a concern for the individuals involved, and programs to eliminate poverty are often justified by appeals to altruism. However, if poverty has significant spillover effects on community well-being, poverty reduction would receive additional justification.<sup>4</sup>

Using pooled data allows controls for regional heterogeneity and for changes in national economic policy over the past 30 years. In addition, through the use of interaction variables between time effects and regressors, we can test whether the effect of a particular regressor has changed over time. As shown below, this is often the case in regressions determining both the level and the change in poverty rates.

The paper is organized as follows. Section II contains a description of the data and an overview of the estimation methodology. Section III presents the results of the empirical investigation, and Section IV concludes.

## **II. Data and Methodology<sup>5</sup>**

The poverty rate is defined as the percentage of the population with incomes

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<sup>4</sup>Of course, such justification already exists due to concerns about poverty-related problems like crime, substance abuse, and the like.

<sup>5</sup>All data for this paper are taken from the Department of Housing and Urban Development web page “State of the Cities data System” at <http://socds.huduser.org/>, and from U.S. Department of Commerce, Bureau of the Census, *State and Metropolitan Area Data Book*, various issues.

below a threshold level. The poverty threshold is adjusted by changes in the consumer price index, so that it is always reported in current dollars. For example, a family of four with two children would be in poverty in 2002 if the family income fell below \$18,244 (U.S. Census Bureau, 2003b).

The use of a national poverty threshold to measure regional poverty rates can lead to misleading estimates of poverty, however, as costs of living differ across geographical areas. Price indexes compiled by the Bureau of Labor Statistics (BLS) across Census regions and for large cities measure only relative inflation and not cost-of-living differences.

To address this issue, the Panel on Poverty and Family Assistance of the National Academy of Sciences (NAS) developed a series of indexes to adjust poverty thresholds using housing rents for comparable units in different Census divisions (Short 2001b). Clearly, regional price levels differ in more than just housing costs; however, housing costs do comprise 31 percent of the Consumer Price Index, and the regional housing price indexes account for over 90 percent of the variation in the composite regional price indexes over the years 1984 through 2001 (these results available on request).

We use reported differences in median house prices to develop cost of living adjustments for the MSAs used in this study. MSAs are grouped geographically by Census division, a convention we shall use throughout the paper. Census divisions, collections of between four and nine contiguous states, appear to be a good compromise between aggregation at the national level and losing all regional heterogeneity, and aggregating at the state level.<sup>6</sup> Our “cost of living” index assumes that housing accounts

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<sup>6</sup>The nine Census divisions are: New England (NE), including Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; Middle Atlantic

for 30 percent of household expenditures, and that all other prices are equal across MSAs (an obvious oversimplification). We then adjust the poverty rates directly via the cost of living index.<sup>7</sup> The results of this adjustment, for poverty rates over the entire sample and for the most recent census of the year 2000, are shown in Table 1.

[Table 1 about here]

The use of the experimental price indexes compresses the range of divisional poverty rates. As might be expected, divisions with higher incomes tend to have higher living costs, so poverty rates tend to be equalized when cost differences are accounted for.<sup>8</sup> The evidence presented here indicates that adjustments for geographic cost-of-living differentials would lower the national poverty rate by about three tenths over the sample period, an amount similar to the adjustment estimated by Short (2001b) for the single year 1997. Henceforth, poverty rates used in the paper will be those adjusted by the geographic cost differentials, except as noted.

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(MA), including New Jersey, New York, and Pennsylvania; East North Central (ENC), including Illinois, Indiana, Michigan, Ohio and Wisconsin; West North Central (WNC), including Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; South Atlantic (SA), including Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia; East South Central (ESC), including Alabama, Kentucky, Mississippi, and Tennessee; West South Central (WSC), including Arkansas, Louisiana, Oklahoma, and Texas; Mountain (MT), including Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming; and Pacific (PAC), including Alaska, California, Hawaii, Oregon and Washington.

<sup>7</sup>Essentially, we are assuming that the income density function has elasticity of +1 in the neighborhood of the poverty threshold.

<sup>8</sup>The index ranged from a high of 1.19 in the Pacific division to a low of 0.90 in the West South Central division. In 2000, the highest median house price was \$470,900 in Stamford, CT; the lowest was \$53,000 in McAllen, TX.

Because the poverty rate is defined to be the percent of the population with incomes below a certain threshold, it makes sense to model the rate as determined by a parameterized Cumulative Distribution Function (CDF) of population incomes:

$$\Pi_{it} = F(\text{Threshold}; \Theta_{it}) \quad (1)$$

where  $\Pi_{it}$  is the poverty rate in MSA  $i$  at time  $t$ ,  $F$  is the CDF,  $\text{Threshold}$  is the poverty threshold, and  $\Theta_{it}$  is a vector of parameters. We assume that  $\Theta_{it}$  is a function of the economic, demographic and social characteristics of the population. We do not attempt to model  $\Theta_{it}$  directly, but instead model the poverty rate in the reduced form:

$$\Pi_{it} = \mu_i + \tau_t + X_{it}\beta + \varepsilon_{it} \quad (2)$$

where  $\mu_d$  is the fixed effect for division  $d$ ;  $\tau_t$  is the time effect for decade  $t$ ;  $X_{it}$  is a  $1 \times k$  vector of independent variables, which includes interaction effects;  $\beta$  is a  $k \times 1$  vector of coefficients, and  $\varepsilon_{it}$  is the time and unit specific random effect.

One benefit of using disaggregated data is the availability of demographic controls previously associated with poverty. According to Sawhill (1988), “[O]ne’s chances of being poor is greatly increased if one is black, lives in a female-headed household, or is a child.” The variables included to control for demographic effects are the per cent of population that is black and the per cent Hispanic, the per cent of the population that is 5 years or younger and 65 and older, and the percent of households that is headed by a single parent.

The significant increase in the nation’s Hispanic population (from 5 percent of the MSA population in 1970 to 10 percent in 2000) is not evenly distributed among the regions; the range in 2000 is from two percent in the East South Central to 21 percent in

the Far West. Because many of this group are new entrants to the workforce and have below-average educational attainment, poverty rates among Hispanics are relatively high (about twice that of non-Hispanic whites).

Children comprise a disproportionately large share of the poverty population, with rates about half again as high as working age adults. On the other hand, those ages 65 and over have seen declining poverty rates over the sample period, from about twice those of working age adults in 1970 to parity in 2000. Blacks have poverty rates about twice those of non-Hispanic whites, but have not changed much as a percentage of the total population over the sample period (about 10 percent). And families with single parents have poverty rates that are about five times those of married couple families (U.S. Census Bureau, 2003c).

Transfer payments are included to account for attempts to redistribute incomes. Transfers have been accorded a role in the poverty reduction of the 1960s (Danziger and Gottschalk, 1995), especially among the elderly, where Social Security and Medicare payments have risen much faster than per capita incomes, but later decades have seen fewer anti-poverty initiatives, and spending was never so large as to lift large numbers of individuals above the poverty line (R.B. Freeman, 2001). Ellwood and Summers (1986) provide evidence that the behavioral effects of transfers may have offset the direct effects of poverty reduction.

Individuals with less than a high school diploma as a group have incomes about half the national average and about one-third those with college degrees. The dropout rate is included to measure the effect of education levels on the poverty rate. Recent immigrants may also face higher poverty; median incomes of non-U.S. citizens are about

two-thirds those of either native born or naturalized citizens. Percent of the MSA population accounted for by immigrants is therefore also included as a regressor.

Manufacturing as a percent of total employment is included to control for structural change in local labor markets. Because manufacturing employment represented a traditional source of middle-class income for semi-skilled workers, the shift away from manufacturing jobs is used as a proxy for the larger structural changes in the rewards to skills and education in the labor market in general.

The indicator of the labor market included is the employment/population ratio. The ratio provides a measure of slack in the labor market, controls for cyclical conditions that may differ over time periods, and may act as a signal of regional economic health. As noted by Blanchard and Katz (1992), potential employers may view low rates as a measure of excess capacity, or alternatively as a signal that a region is undesirable to other employers.

Finally, we include dummy variables to control for MSA size. Those MSAs with population over one million are designated as “Large”; those with populations under 150,000 are designated as “Small.” Each category accounts for about 20 percent of the sample. Large cities tend to have a more educated work force, a more diversified industrial base, and a more rapid response to technological innovations. Hence we expect poverty rates to be lower in larger cities than in smaller ones.

Table 2 provides descriptive statistics for the variables used in the empirical analysis. Means, standard deviations, minima and maxima are reported for the entire sample, and for the most recent census. All variables are reported as percentages.

*Poverty, Immigrants, Black, Hispanic, Under 5, Over 65, and Employ/Popul* are percent

of the total MSA population; *Transfers* is percent of total income; *Manufacturing* is percent of total employment; and *Single Parents* is percent of total families with children.

[Table 2 about here]

Briefly, it is apparent that MSAs have become more educated over time, and that transfers have grown as a proportion of income. There are now more immigrants, Hispanics and single parents than formerly, the nation has aged, with fewer very young and more older population, and manufacturing is now a smaller proportion of total employment.

In the following section, we report the empirical analysis of the determinants of the levels and the changes in the poverty rate, and an exploratory analysis of the role of poverty in MSA growth.

### **III. Empirical Results**

The first order of business is to estimate equation (2) in levels. The purpose is to learn something about the determinants of poverty, as they are traditionally described, and whether these determinants are constant over time. In Table 3, we report the results of several models, differing by the definition of the poverty variable, by the inclusion of time and fixed effects, and by the time periods of estimation.

[Table 3 about here]

Column 1 of Table 3 uses the poverty rate as determined by the national poverty threshold as the dependent variable, and includes no fixed or time effects. The results are congenial to many of the usual suppositions about poverty: fewer manufacturing jobs, a greater percentage of single parents, lower education levels, and a larger percentage of

minority population is associated with higher levels of poverty (Madden, 1996; Levernier, Partridge and Rickman, 2000). The squared terms on the minority and education variables indicate that poverty increases at an increasing rate at higher concentrations.<sup>9</sup> Being a large MSA results in lower poverty and being a small one results in higher poverty, as expected.

Among results not so expected, transfers have no effect on poverty, and a higher proportion of immigrants and higher concentrations of either the very young or the old lead to lower rates of poverty. We might expect higher concentrations of old and young to increase poverty because of the increase in the dependency ratio, and because very young children require an enormous amount of time for their care: time that cannot be used for market work. Alternatively, workers at or near the poverty line may find the net benefit of market work too small to overcome the hurdle of child care expenses, and choose a lower money income. We shall see, however, that the results of Table 3 are sensitive to the econometric specification, especially with respect to the sign of the coefficient of young children.

The estimates in column 1 depend only on the variation in the regressors to capture all of the heterogeneity in the sample, however, and while a good deal of the variation (74 percent) of the variation in the poverty rate is explained, it is likely that some factors of place, like amenities, local tax burdens, right-to-work laws, and so forth, may also be important in explaining poverty. Similarly, factors common to the entire

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<sup>9</sup>The mixed signs of the coefficients (linear coefficient negative, squared coefficient positive) on *Black* indicate that the partial of the poverty rate with respect to the black population (in column 3) is negative at a percentage of the black population below 11.33, and positive above, suggesting that it is only above certain thresholds that increases in minority populations lead to higher poverty. See also Levernier (2003).

sample but differing at points of time, like national legislation or economic policy, may also have an effect. In column 2, we include decade and census division dummy variables to help capture some of this potential omitted heterogeneity.<sup>10</sup>

Including the dummy variables doubles the size of the employment coefficient, causes the immigration variable to become insignificant, and generally increases the magnitude of the demographic variables. Relative to the 2000 census and the Pacific division, poverty in 1970 was lower and that of 1980 and 1990 was higher, controlling for the regressors, as was poverty in the South and Southwest. The improvement in the adjusted  $R^2$  and in the value of the likelihood function indicate that inclusion of the dummy variables is justified.

Column 3 introduces our measure of poverty adjusted for housing costs at the MSA level, and retains the dummy variables for decade and division effects. The notable changes here are in the immigration variable, which coefficient changes sign to positive, in the rejection of convexity in the Hispanic variable, and as expected, in the division dummy variables. The Pacific division has the highest housing prices (on average), and we now see that most other divisions, the East South Central excepted, have lower poverty rates, presumably due to their lower cost of living. Because we are persuaded that accounting for the cost of living (notwithstanding the limitations of our measure) is a crucial element in determining poverty levels, we will continue to use the adjusted rates for the remainder of this section.

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<sup>10</sup>State and individual fixed effects were also included in other models, but did not result in substantive changes from the results with division-level dummies.

Columns 4 and 5 report the results of splitting the sample in half in order to test the stability of the estimates, something that is not possible in much of the previous work, which used a single census (Levernier, 2003; Levernier, Partridge and Rickman, 2000), or changes over two censuses (Madden, 1996). As the structure of the economy changes, so may the factors underlying poverty, or at least the importance of these factors.

Transfers are now significant and negative in the first half of the sample, and insignificant in the second half. This finding accords with Sawhill (1998), who finds that the poverty-reducing effectiveness of transfer programs was much diminished after about 1980.<sup>11</sup> We also note that immigration has a larger effect on poverty in more recent decades, but that the effect of the Hispanic population in the later sample is virtually nil. Educational differences, as exemplified by the dropout rate, are stronger in the first half. These differences notwithstanding, there are no sign reversals in the coefficients among the economic and demographic variables across the two samples, indicating some support for the stability of these factors in explaining the poverty rate.

The situation is much different with respect to the division fixed effects across the samples, however. Here we have six sign reversals out of a possible eight, and of the two signs that agree, the difference in magnitude is statistically significant (as, indeed, are all the differences). This suggests that (1) the division fixed effects are not really fixed; and (2) that there are forces driving changes in poverty levels that are not being measured by the economic and demographic variables contained in our model.

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<sup>11</sup>Aid to Families with Dependent Children, an entitlement, was replaced in 1996 by the Personal Responsibility and Work Opportunity Reconciliation Act. The replacement program is Temporary Assistance for Needy Families, a conditional benefit (Pavetti 2001).

Another possibility is that the correlations between poverty levels and the regressors are spurious. To test this possibility, we re-estimate the model using first differences, and then test for interaction between the decade dummies and the economic and demographic variables. Table 4 reports the results of these estimations.

[Table 4 about here]

In column 1 of Table 4, no division effects have been included. The signs of the coefficients of transfer payments, manufacturing employment, employment/population ratio, immigration, single parent families, and dropouts are the same as the levels model in column 3, Table 3, but the magnitudes are larger in each case. The over 65 variable is also of the same sign but is smaller in magnitude. Black and Hispanic, however, are no longer significant, and the under 5 variable has changed signs and is now significantly positive.

In column 2, division fixed effects are added. An *F*-test indicates that there are significant differences in the intercepts of the division changes in poverty, suggesting that there are division-specific trends in the poverty rate. The coefficients of the regressors in column 2 retain the same sign as those of column 1, but there are magnitude changes of some importance for employment/population, dropout rate, and over 65 population.

The results of columns 1 and 2 of Table 4 suggest that at least some of the correlations of levels in Table 3 are spurious, notably the changes in the age and race variables. We may also wonder if the coefficients in Table 4 are stable across time periods. To test for aggregation bias, we include interaction terms between the regressors and the decade dummies (the latter equal 1 for either the first difference between the 1980-1990 or the 1990-2000 census, and 0 otherwise). These results are reported in

columns 3 through 5. Column 3 reports the estimated coefficient for the variable, which in this context is the effect for the 1970-1980 change in poverty. Column 4 reports the combined effect of the estimated coefficient and the interaction term for the 1980-1990 change, and column 5 reports the same for 1990-2000.

The increase in  $R^2$  and the significance of the  $F$  - test of the restrictions to a common slope across time periods are strong evidence of significant differences in the estimated effects of the regressors across census periods. The negative effect of the decline in manufacturing jobs appears to have little impact in the 1990-2000 time period, and increases in single-parent families are somewhat anomalously associated with decreases in poverty during the same period. There are inconsistencies in the signs of the employment/population and race variables, and transfers are no longer significant in any decade. Changes in immigration and the older population have effects only in 1970-1980, while the entire effect of the youth variable is confined to the 1990-2000 decade.

The conclusion to be drawn from Table 4 is that we should be very cautious in ascribing causes to the changes in poverty that we observe across time. Prior research that has focused on a single cross-section or on a single decade may capture associations between poverty and explanatory variables that are not robust to other time periods. While we have not done so in this paper, tests of further interactions of explanatory variables across divisions are also possible, and may be revealing of relationships that are sensitive to spatial as well as temporal changes.

#### *Does existing poverty affect future growth?*

The implicit assumptions in all the models examined thus far is that poverty is the result of factors that determine the income distribution. What we have found is that at

least some of the factors that have been held traditionally to cause poverty are not stable in their effects. In this sub-section, we examine whether poverty has self-reinforcing effects on itself through the medium of economic growth.

A high level of poverty implies underutilization of societal resources and hence reduced growth in the current period. However, more intensive utilization of these untapped resources may also represent higher future growth. Recent work by Mariacristina De Nardi, as cited in Clements (2003), argues that lower savings and accumulation of wealth by the poor results in lack of productivity in the current generation and low financial and human capital transfer to the next, thus perpetuating the poverty cycle, exacerbating inequality of wealth and income, and diminishing economic growth.

We test the effect of poverty on growth by including the poverty rate at the beginning of a decade in a regression of MSA growth during the decade on initial conditions. The methodology is that of the “conditional convergence” model of Mankiw, Romer and Weil (1992) or Barro and Sala-i-Martin (1992), which posits that in the neo-classical framework, growth of economies within a region should be negatively related to initial income (the convergence hypothesis), conditioned on economy-specific variables like education, capital stock, etc.:

$$\Delta y_{iT} = \tau_t + \beta y_{i0} + \mathbf{X}'_{i0} \Gamma + v_i \quad (3)$$

where  $y_{it}$  is income (in logarithms) for unit  $i$  at time  $t$ ,  $\tau_t$  a fixed effect for decade  $t$ ,  $\beta$  is the convergence parameter,  $\mathbf{X}$  is a vector of conditioning variates and  $\Gamma$  a vector of coefficients, and  $v_i$  an error terms with the usual properties. In a variation of this model,

we also estimate the change in the employment/population ratio conditioned on the initial ratio. The results of these estimates are reported in Table 5.

[Table 5 about here]

Two regressions are estimated for each dependent variable: a pooled regression over the entire sample with ten-year growth rates regressed on initial values at the beginning of the ten year period, and a single ten-year period from 1990 to 2000. Again, the point is to test for structural change during the full sample. What we find in all cases is the expected negative relationship between the growth rate and the initial value of the income/employment variable. We also find that the initial poverty rate is significantly and negatively related to the dependent variable in all cases, and for the income equation, more strongly so during the most recent decade.

Other results include strongly positive coefficients in the income equation, but somewhat mixed results in the employment equation for the college variable. Larger black or Hispanic populations indicate higher income growth (both groups made up significant ground in the income gap with whites during the sample), but lower employment gains. A larger immigrant population indicates lower growth in both income and employment, while areas with higher cost of living (as measured mainly by housing prices) experienced higher income, but lower job growth, in the 1990s. The age variables had mixed (and somewhat inconsistent) results in the income equations, but reasonable results in the employment equations, as higher dependency ratios result in a smaller labor force. Large MSAs experienced higher income and job growth, except for the 1990s taken alone, and small MSAs had lower income growth over the entire sample.

These results are very preliminary (we are not making use of the entire change in industrial structure that took place within MSAs over the sample period, for example), but they are indicative of the potential effect of poverty on the growth prospects of MSAs, and represent yet another justification for intensifying efforts to reduce poverty. Poverty is not only harmful to the poor, but may also diminish the well-being of entire cities and metropolitan areas.

#### **IV. Conclusions**

The causes and consequences of poverty have been extensively studied in a wide range of settings. There are, however, few studies that examine poverty at the regional level over an extended period. This paper is an attempt to augment the current literature by examining the determinants of the levels and changes in the poverty rate for 331 Metropolitan Statistical Areas in the U.S., measured at ten-year intervals over the period 1970-2000. We also examine whether poverty as an initial condition has an effect on future growth in incomes and/or employment, and our tentative conclusion is that a higher level of existing poverty is indeed a detriment to future growth.

Our principal conclusions are that the determinants of poverty that we have identified are relatively stable predictors of poverty levels, in that the indicated direction of change is consistent over the sample period, but that the magnitude of the response varied considerably from the first to the latter half of the sample. Far less consistent are the factors that we are unable to measure, but are proxied by the division fixed effects. In none of the eight possible cases do the signs and significance levels both agree across the

two halves of the sample. These findings lead to the possibility that the correlations between poverty and such variables as minority populations may be spurious.

We therefore re-estimate our models in first difference form, to examine whether changes in the regressors are associated with changes in the poverty rate. Here we find that the coefficients for the regressors are unstable over the three decades of changes in the sample period. Most notable, coefficients for black, Hispanic, and even single parents can be positive, negative, or zero, depending on the decade. Only the manufacturing, education, and immigration variables are consistent in sign, but not in significance level, over the entire sample. What the results seem to be telling us, quite sensibly, is that there is nothing in minority status *per se* that condemns a person to poverty, but it is rather the *characteristics* of the individual, in their education, industrial classification, or acculturation, that make the more important difference achieving a higher level of income.

Figure 1

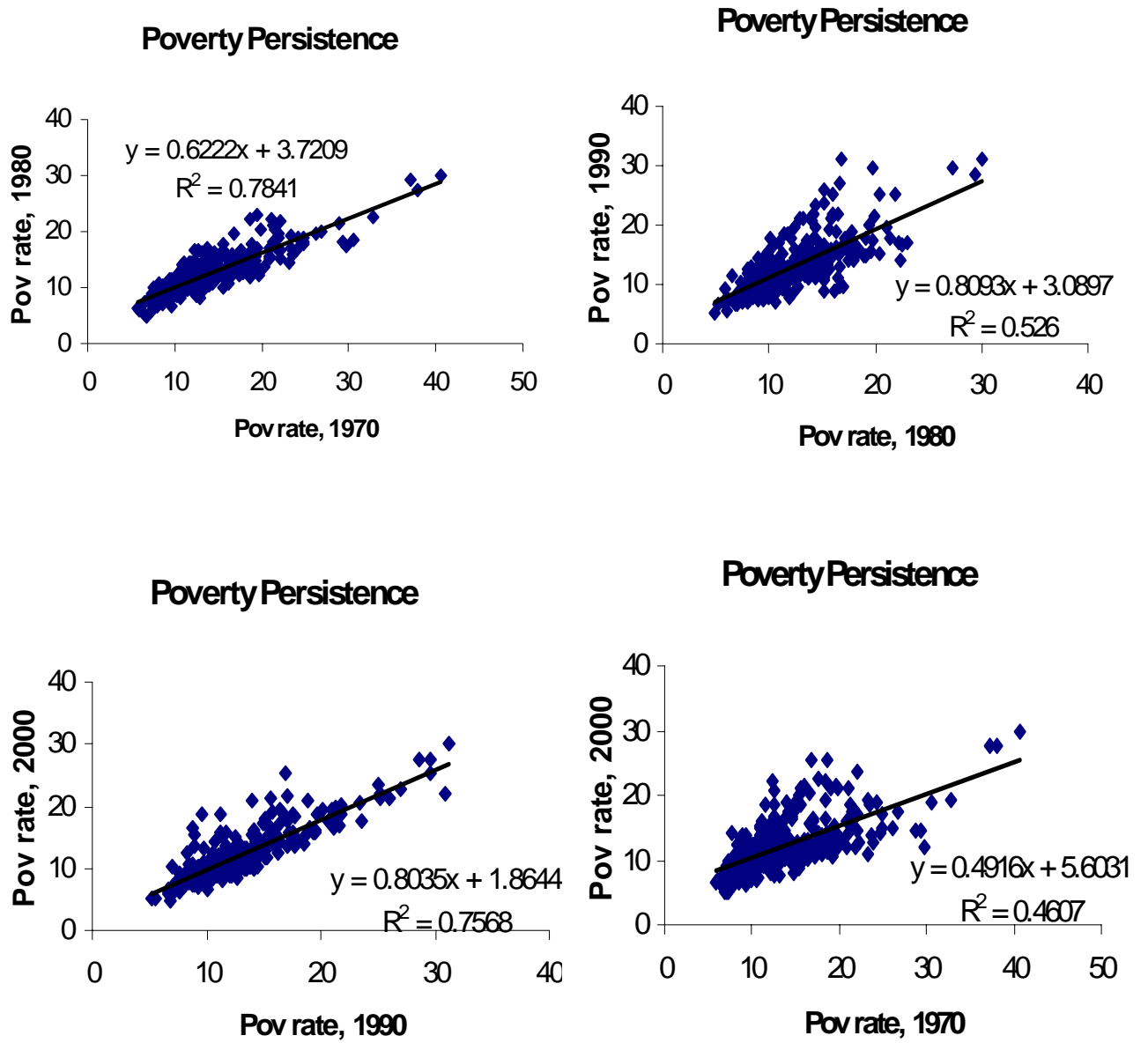


Table 1. Poverty Rates, Nine Census Divisions, as Originally Reported and as adjusted for Housing Costs, census years 1970-2000

	Originally Reported	Adjusted for Housing	Difference
Average, 1970-2000:			
New England	9.1	10.0	+0.9
Middle Atlantic	10.5	10.6	+0.1
East North Central	9.8	9.4	-0.4
West North Central	10.5	10.0	-0.5
South Atlantic	14.7	14.1	-0.6
East South Central	16.3	15.1	-0.8
West South Central	17.5	15.8	-1.7
Mountain	12.6	12.8	-0.6
Pacific	12.8	14.5	+1.7
2000 only:			
New England	8.8	9.6	+0.8
Middle Atlantic	10.8	10.8	--
East North Central	10.3	9.9	-0.4
West North Central	10.2	9.7	-0.5
South Atlantic	12.8	12.3	-0.5
East South Central	14.3	13.3	-1.0
West South Central	16.8	15.0	-1.8
Mountain	12.4	12.7	+0.3
Pacific	13.5	15.6	+2.1

Table Notes: See accompanying footnotes for states comprising Census Divisions

Table 2: Descriptive Statistics, Poverty Regressions, 331 MSAs, 1970-2000

	Mean	Std Dev	Minimum	Maximum
<i>Full Sample</i>				
<i>Poverty</i>	12.61	4.47	4.92	40.66
<i>Transfers</i>	6.75	4.94	0.37	36.66
<i>Manufacturing</i>	19.37	9.60	3.13	56.73
<i>Dropout</i>	30.02	12.91	6.34	69.74
<i>College</i>	17.84	7.58	5.06	52.38
<i>Immigrants</i>	5.16	5.69	0.20	50.94
<i>Single Parents</i>	20.28	6.96	6.40	42.48
<i>Black</i>	9.71	10.00	0.00	50.77
<i>Hispanic</i>	6.86	12.30	0.06	94.28
<i>Under 5</i>	7.48	1.20	3.00	14.80
<i>Over 65</i>	11.29	3.62	1.40	39.19
<i>Employ/Popul</i>	44.15	5.34	24.82	58.85
<i>2000 Census</i>				
<i>Poverty</i>	12.18	3.97	4.93	29.93
<i>Transfers</i>	12.57	3.68	4.53	33.17
<i>Manufacturing</i>	14.84	6.44	3.13	42.63
<i>Dropout</i>	18.30	6.16	6.34	49.55
<i>College</i>	23.72	7.43	11.05	52.38
<i>Immigrants</i>	7.38	7.43	0.85	50.94
<i>Single Parents</i>	28.57	4.30	12.06	42.48
<i>Black</i>	10.41	10.55	0.15	50.77
<i>Hispanic</i>	9.91	14.32	0.48	94.28
<i>Under 5</i>	6.70	0.92	3.71	10.96
<i>Over 65</i>	12.61	3.37	5.47	34.72
<i>Employ/Popul</i>	47.10	4.31	31.65	57.97

Table 3: Regressions of Poverty Levels, 331 MSAs, 1970-2000 (heteroskedastic-consistent absolute values of t-statistics in parentheses)

Poverty Rate:	Official		Adjusted for Housing Costs		
Model	1970-2000 (n = 1324)	1970-2000 (n = 1324)	1970-2000 (n = 1324)	1970-1980 (n = 662)	1990-2000 (n = 662)
Variable	(1)	(2)	(3)	(4)	(5)
<i>Transfers</i>	0.015 (0.79)	-0.002 (0.07)	-0.007 (0.24)	-0.100** (2.94)	-0.002 (0.01)
<i>Manufact</i>	-0.146** (15.24)	-0.127** (12.09)	-0.130** (12.55)	-0.119** (9.33)	-0.081** (4.96)
<i>Employ/Pop</i>	-0.201** (8.63)	-0.417** (14.03)	-0.319** (10.66)	-0.365** (8.51)	-0.243** (5.81)
<i>Immigration</i>	-0.067** (2.78)	0.017 (0.76)	0.156** (4.85)	0.068* (1.83)	0.178** (4.08)
<i>Single Parent</i>	0.245** (10.65)	0.300** (10.68)	0.215** (7.02)	0.291** (6.00)	0.247** (5.84)
<i>Black</i>	0.065** (2.65)	-0.079** (2.78)	-0.034 (1.20)	-0.087** (2.17)	-0.056* (1.75)
<i>Blacksqr</i>	0.001* (1.88)	0.003** (4.15)	0.003** (3.75)	0.005** (5.12)	0.002** (3.15)
<i>Hispanic</i>	0.037 (1.48)	0.024 (1.04)	0.052** (2.60)	0.054* (1.81)	0.023 (0.86)
<i>Hispanicsqr</i>	0.002** (5.06)	0.001** (2.84)	0.001 (0.25)	0.001 (1.13)	0.000 (0.09)
<i>Dropout</i>	-0.030 (0.66)	-0.198** (3.70)	-0.196** (4.07)	-0.406** (5.06)	-0.003 (0.34)
<i>Dropoutsqr</i>	0.003** (4.88)	0.006** (7.82)	0.005** (8.24)	0.007** (6.99)	0.003** (2.23)
<i>Large city</i>	-1.414** (7.30)	-0.815** (4.79)	-0.774** (4.20)	-0.459** (2.07)	-0.766** (3.10)
<i>Small city</i>	1.335** (7.73)	1.129** (7.30)	0.979** (6.51)	1.108** (5.88)	0.648** (3.19)
<i>Under 5</i>	-0.270** (2.05)	-0.455** (3.45)	-0.518** (3.72)	-0.475** (2.79)	-0.805** (3.75)
<i>Over 65</i>	-0.197** (5.56)	-0.399** (10.22)	-0.356** (9.14)	-0.334** (6.44)	-0.368** (6.63)
<i>DEC70</i>		-1.673** (2.21)	-0.601 (0.84)	-0.664 (1.35)	--

<i>DEC80</i>		0.798* (1.62)	1.195** (2.30)	--	--
<i>DEC90</i>		2.862** (9.16)	2.786** (8.80)	--	2.467** (6.27)
<i>Div1</i>		0.111 (0.35)	-0.615* (1.74)	0.527 (1.18)	-1.686** (3.14)
<i>Div2</i>		0.112 (0.31)	-1.132** (2.89)	-0.190 (0.46)	-1.903** (3.00)
<i>Div3</i>		0.222 (0.69)	-1.053** (2.95)	0.059 (0.16)	-2.360** (3.92)
<i>Div4</i>		1.045** (3.22)	-0.526 (1.39)	0.924** (2.30)	-1.991** (3.24)
<i>Div5</i>		1.589** (4.11)	-0.048 (0.12)	1.716** (2.57)	-1.682** (2.58)
<i>Div6</i>		2.654** (5.93)	1.052** (2.19)	3.334** (6.08)	-1.283* (1.87)
<i>Div7</i>		2.184** (5.69)	0.062 (0.15)	1.758** (3.56)	-0.953 (1.54)
<i>Div8</i>		-0.101 (0.35)	-0.924** (2.49)	-0.179 (0.41)	-1.570** (2.66)
<i>Adj R2</i>	0.745	0.814	0.753	0.834	0.743
<i>LogL</i>	-3043.16	-2873.15	-2920.91	-1368.20	-1417.34

Chow F-test: 10.15 (p = 0.000)

Table 4: Regressions of First Differences of Poverty Rates on Demographic and Economic Variables, 331 MSAs, Census Years, 1970-2000

Model	No Div. Effects		Interaction terms		
	1970-2000 (n=993)	1970-2000	Effect, 1970-1980	Combined Effect, 1980- 1990	Combined Effect, 1990-2000
<i>Transfers</i>	-0.0267* (1.85)	-0.027* (1.85)	-0.065 (1.35)	-0.007 (0.18)	-0.018 (0.85)
<i>Manufact</i>	-0.230** (7.44)	-0.167** (4.98)	-0.159** (3.20)	-0.138** (3.01)	-0.001 (0.02)
<i>Employ/Pop</i>	0.096** (2.43)	0.021 (0.51)	-0.176** (2.34)	-0.467** (4.85)	0.509** (5.68)
<i>Immigration</i>	0.251** (3.09)	0.251** (3.09)	0.387** (3.79)	0.057 (0.46)	0.110 (1.04)
<i>Single Parent</i>	0.334** (6.48)	0.315** (6.37)	0.399** (5.87)	0.019 (0.21)	-0.129* (1.63)
<i>Black</i>	0.052 (0.64)	0.061 (0.76)	-0.067 (0.58)	0.256** (2.07)	0.024 (0.24)
<i>Hispanic</i>	-0.025 (0.36)	-0.022 (0.36)	-0.104 (1.43)	0.564** (4.36)	-0.163** (2.37)
<i>Dropout</i>	0.242** (5.51)	0.089* (1.91)	0.152** (2.44)	0.038 (0.59)	0.224 ** (2.24)
<i>Under 5</i>	0.363** (2.43)	0.360** (2.46)	-0.019 (0.07)	0.286 (0.97)	0.575** (2.03)
<i>Over 65</i>	-0.154* (1.87)	-0.079 (0.98)	-0.419** (3.69)	0.214 (1.95)	0.075 (0.56)
<i>Adj R2</i>	0.236	0.289	0.563		
<i>LogL</i>	-2293.03	-2239.26	-1952.51		
<i>F-test of restrictions</i>		10.15 (p = 0.000)	17.91 (p = 0.000)		

Table 5: Regressions of Income and Employment Growth on Initial Conditions, 331 MSAs, 1970-2000

Variable	Model	Growth in Median Income		Growth in Employment\Population	
		1970-2000	1990-2000	1970-2000	1990-2000
<i>Income</i>		-0.374** (11.6)	-0.393** (12.1)	--	
<i>Employment /Population</i>		--	--	-0.492** (21.5)	-0.340** (11.0)
<i>Poverty</i>		-0.459** (3.74)	-1.111** (9.16)	-0.114** (3.80)	-0.086** (2.19)
<i>College</i>		0.711** (9.96)	0.427** (7.79)	0.001 (0.05)	0.078** (3.44)
<i>Black</i>		0.180** (4.64)	0.100* (3.11)	-0.046** (3.89)	-0.059** (5.42)
<i>Hispanic</i>		0.081* (1.79)	0.098** (2.23)	-0.038** (3.26)	-0.040** (3.32)
<i>Manufacturing</i>		0.068* (2.27)	0.027 (0.69)	-0.020* (1.87)	-0.007 (0.66)
<i>Immigrant</i>		-0.129 (1.18)	-0.205** (2.64)	-0.105** (3.29)	-0.100** (2.67)
<i>Cost of Living</i>		0.005 (0.16)	0.090** (3.02)	0.001 (1.55)	-0.024** (2.29)
<i>Under 5</i>		-2.28** (6.28)	0.797** (2.42)	-0.767** (7.95)	-0.310** (2.20)
<i>Over 65</i>		-0.024 (0.25)	0.062 (0.81)	-0.429** (15.3)	-0.131** (3.97)
<i>Large</i>		1.899** (2.65)	1.159** (2.24)	0.942** (4.56)	0.198 (1.06)
<i>Small</i>		-2.331** (4.09)	-0.707 (1.50)	-0.193 (1.17)	0.226 (1.28)
<i>Adj R2</i>		0.349	0.632	0.590	0.734

## References

- Barro, Robert J. and X. Sala-i-Martin, 1992, "Convergence," *Journal of Political Economy* 100 (2), 223-251.
- Bauer, Carl M. 1982. Kennedy, Johnson and the war on poverty. *The Journal of American History*, 69: 98-119.
- Blanchard, Olivier, and Lawrence Katz. 1992. Regional evolutions. *Brookings Papers on Economic Activity* 1: 1-75.
- Clement, Douglas. 2003. Accounting for the Rich. *The Region* (Federal Reserve Bank of Minneapolis) 17: 8-11; 48-52.
- Danziger, Sheldon, and Peter Gottschalk. 1995. *America Unequal*. Cambridge, MA: Harvard University Press.
- Ellwood, David, and Lawrence Summers. 1986. Poverty in America: Is welfare the answer or the problem? In *Fighting Poverty: What Works and What Doesn't*, edited by Sheldon Danziger and Daniel Weinberg. Cambridge, MA: Harvard University Press.
- Freeman, Richard B. 2001. The rising tide lifts...? In *Understanding Poverty*. Edited by Sheldon Danziger and Robert Haveman. New York: Russell Sage Foundation.
- Levernier, William. 2003. An Analysis of Poverty in the American South: How are Metropolitan Areas Different from Nonmetropolitan Areas? *Contemporary Economic Policy* 21: 372-382.
- Levernier, William, Mark Partridge, and Dan Rickman. 2000. The causes of regional variations in U.S. poverty: A cross-country analysis. *Journal of Regional Science*. 40: 473-497.

- Madden, Janice Fanning. 1996. Changes in the Distribution of Poverty across and within U.S. Metropolitan Areas, 1979-89. *Urban Studies* 33: 1581-1600.
- Mankiw, N.G., D. Romer and D.N. Weil, 1992, "A Contribution to the Empirics of Economic Growth," *The Quarterly Journal of Economics* 107, 407-438.
- Pavetti, Ladonna. 2001. Welfare policy in transition: Redefining the social contract for poor citizen families with children and for immigrants. In *Understanding Poverty*, edited by Sheldon Danziger and Robert Haveman. New York: Russell Sage Foundation.
- Sawhill, Isabel. 1988. Poverty in the U.S.: Why is it so persistent? *Journal of Economic Literature*. 26: 1073-1119.
- Short, Kathleen. 2001a. U.S. Census Bureau, Current Population Reports, P60-216, *Experimental Poverty Measures: 1999*. Washington, D.C.: U.S. Government Printing Office.
- Short, Kathleen. 2001b. Where we live: Geographic differences in poverty thresholds. U.S. Census Bureau Working Paper, January.
- U.S. Census Bureau. 2003a. Metropolitan and Micropolitan Statistical Areas. Available at [census.gov/population/www/estimates/00-32997.pdf](http://census.gov/population/www/estimates/00-32997.pdf)
- U.S. Census Bureau. 2003b. Poverty thresholds. Available at <http://www.census.gov/hhes/poverty/threshld.html>.
- U.S. Census Bureau. 2003c. Historical Poverty Tables. Available at <http://www.census.gov/hhes/income/histinc/histpovtb.html>