

## GROWTH, INEQUALITY, AND POVERTY: A CAUTIONARY NOTE

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Economic growth had less impact on poverty rates in the 1980s than in the 1960s. Could this be explained by Locke Anderson's observation that the higher median income, the greater the amount of growth needed to achieve a percentage point fall in the poverty rate? No, higher poverty rates are due instead to the rise in income inequality. With higher inequality, however, trickle down could be as effective in the 1990s as it was in the late 1960s. More generally, assessments of anti-poverty policy must recognize that inequality is as vital to changes in the poverty rate as growth in mean income.

In 1964 W. H. Locke Anderson wrote that "the elimination of poverty through 'trickling down' is likely to be slower and more uncertain in the future than in the past." At first glance, U.S. experience appears to have borne him out: During the 1980s, economic growth seemed to have less impact on the incidence of poverty than in the 1960s. Anderson's point was a simple one: Given an approximately lognormal distribution of roughly constant shape and given a fixed poverty threshold below modal income, successive increments to mean income would move fewer and fewer people above the poverty line. Is this nonlinear component of the income-poverty relationship important enough to explain the apparent decrease in the impact of growth on poverty? We find that it is not, and that the explanation appears to lie instead with the sharp rise, starting in the late 1970s, in income inequality. We also find that, *ex post*, the assumption of a lognormal income distribution with changing variance explains the time path of poverty reasonably well.

### ANDERSON'S OBSERVATION

Anderson visualized economic growth as the rightward movement of a log-normal income distribution of constant variance. The poverty rate is the proportion of the population with incomes below a poverty threshold fixed in real terms.

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He noted that, once mean income exceeds the poverty threshold, the density of the income distribution in the neighborhood of the poverty line falls with the poverty rate. Thus, given steady growth of mean real income, each percentage point drop in the poverty rate comes more slowly than the last.

As an illustration, consider a lognormal income distribution of mean 10.05 and variance 0.69 (which roughly describes the 1963 distribution of family income in 1989 dollars).<sup>1</sup> With the poverty line for an average-sized family at approximately 45 percent of median income (as it was in 1963), a 12.5 percent increase in median income would lower the poverty rate by 2.7 percentage points.<sup>2</sup> If the poverty threshold stood instead at 35 percent of the median (as in 1983), the same 12.5 percent rise in income would reduce the poverty rate by only 1.7 percentage points, i.e. by nearly 40 percent less. This decrease in the impact of growth on the poverty rate is similar in magnitude to the decrease we observe in comparing 1963–66 to 1983–89: Although median income rose by almost exactly 12.5 percent in both periods, the poverty rate fell 2.7 percentage points during the earlier period but only 1.9 in the latter.

#### POVERTY AND GROWTH, 1963–91

A crude but simple test of whether Anderson's observation explains the high poverty rates of the 1980s is to see what actual income growth implies for poverty rates, under the assumption that income is lognormally distributed with constant variance. In this exercise, we consider the income and poverty status of U.S. families rather than persons. We focus on the years from 1963 to 1991, the longest period for which we have detailed data. Annual income, family size, and other demographic data are from the *Current Population Survey* (CPS), a sample of 19,652 families in 1963 and 41,994 families in 1991.<sup>3</sup> Income reported in the CPS does not include in-kind income, and is post-transfer and pre-tax. Although the Census Bureau recodes all annual incomes higher than \$100,000 as \$100,000 (between 1967 and 1975, the income ceiling was \$50,000), we avoid the top-coding problem by looking at median rather than mean income. Our poverty cut-offs vary with family size, and are the official poverty thresholds for 1967. We convert poverty cut-offs and all income data into 1989 dollars using the Census Bureau's consumer price index (the CPI-U-X).<sup>4</sup>

<sup>1</sup>A convenient property of the lognormal distribution is that median log income (the same as log median income) equals mean log income.

<sup>2</sup>The poverty line used in this example is for a family of 3.57 persons; please see footnote 5.

<sup>3</sup>In Census Bureau terminology, our sample consists of primary families and unrelated subfamilies. We use the Bureau's definition of family, and hence exclude unrelated individuals. For 1963–87 we use the Mare and Winship (1990) extract of the CPS Annual Demographic (March) tapes released by the Census Bureau. For 1988–91, we use the ICPSR releases of the Census Bureau tapes. For simplicity, we ignore the weights assigned by the Census Bureau; weighting each observation made virtually no difference to the results.

<sup>4</sup>To keep our poverty thresholds fixed in real terms, we used the CPI-U-X rather than the CPI-U. Between 1963 and 1991, official thresholds were indexed at first to the CPI-U and later to the CPI-U-X. The latter is generally agreed to be the better deflator, and we felt accuracy in measuring the evolution of poverty rates mattered more than conformity with official poverty statistics. Since the CPI-U-X rose less over the 1967–91 period than the CPI-U, for the later years our poverty lines are lower than the official ones. Hence the poverty rates we report are lower than comparable official rates.

The assumption of a constant-variance lognormal income distribution implies that the relationship between poverty rates and log median income can be shown by a dashed line like that in Figure 1 (Anderson's "poverty curve").<sup>5</sup> The diminished impact of growth on poverty rates is visible (just barely) in the curve's flatter slope at higher levels of median income. Actual poverty rates in our CPS sample are also shown in Figure 1, and lie above the poverty curve by two or more percentage points during the latter half of the period. Clearly the poverty rates of the 1980s are not predicted by Anderson's observation; they are unexpectedly high.

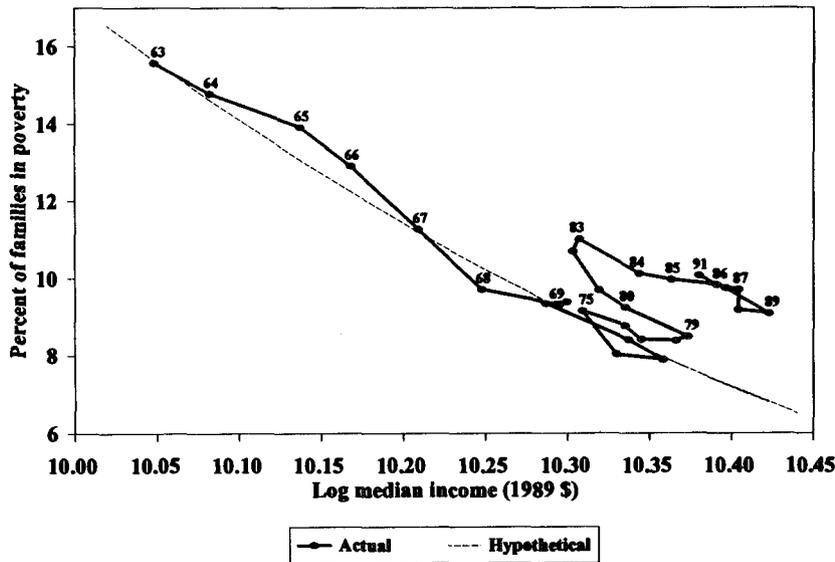


Figure 1. Poverty Rates, 1963-91: Actual and Hypothetical

Could demographic change account for the failure of the lognormal hypothesis during the latter half of the period? It seems plausible, for an increasing proportion of families falls into demographic groups whose incomes are relatively unresponsive to economic growth. The largest of these groups are fatherless families and elderly families. Repeating the above exercise on a sample restricted to nonelderly, couple-headed families does not change matters much, however. Apart from a difference in level, the plot of predicted versus actual poverty rates could hardly be distinguished from Figure 1. Thus the increase in fatherless and elderly families does not explain the divergence between our predicted and our sample poverty rates.

<sup>5</sup>To draw a poverty curve, we had to choose a value for variance and make an assumption about family size. We arbitrarily chose 1970 as our base year, and took the variance and average family size of that year's CPS sample. The assumption about family size was needed because poverty lines are a function of family size, but in our hypothetical lognormal distribution, family sizes are unknown. We took the sample average of 3.57 and derived the corresponding poverty cut-off by interpolating linearly between the 3- and 4-person poverty lines. In fact, average family size declined between 1963 and 1991, implying a slight clockwise rotation of the dashed line shown in Figure 1 about its 1970 value.

These results are consistent with other work. Blank (1993) and Tobin (1992) report that regressions fitted to data through 1983 underpredict poverty in the remainder of the 1980s. Blank also finds that poverty rates during the 1980s would only have been one-half percentage point lower in the absence of demographic change since 1964.

What is it about our lognormal prior that causes it to underpredict poverty starting in the late 1970s? The assumption of constant variance is an obvious candidate. It is by now generally accepted that income inequality in the U.S. has risen since the late 1960s, with the sharpest increase occurring during the early 1980s.<sup>6</sup> A common measure of inequality is the variance of log income. The variance of log income for our CPS sample is shown in Figure 2.

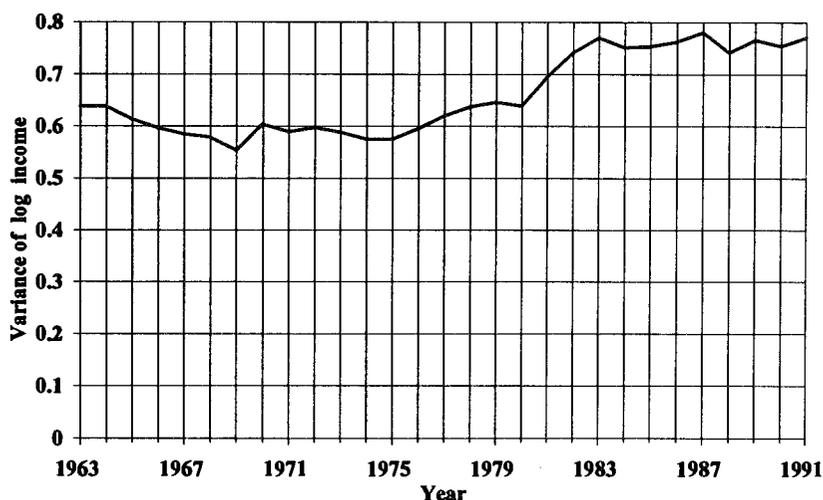


Figure 2. Variance of Log Income for All Families

To test whether the increased dispersion of family income might explain the predictive failure of our lognormal prior in the 1980s, we drop the assumption of constant variance and recompute the hypothetical poverty rates using the sample variance for each year. We find that our prior now gives a much better fit, closing the post-1978 gap between predicted and measured poverty rates. The improvement in fit is easier to see with time series than with another plot like Figure 1. Figure 3 depicts the gap between our sample poverty rate and our constant-variance estimate; as Figure 4 shows, this gap is eliminated by substituting the variable-variance estimate instead.

The conclusion that increased income inequality has greatly slowed our progress against poverty in recent years is consistent with more sophisticated studies that have emphasized changes in the shape of the income distribution in explaining poverty rates, such as Gottschalk and Danziger (1985) or Blank (1993). Gottschalk and Danziger, for example, find that, controlling for changes in mean income and transfers, the rise in income inequality between 1967 and 1982 pushed

<sup>6</sup>See Karoly (1993) for a detailed description of changes in the shape of the income distribution since 1963.

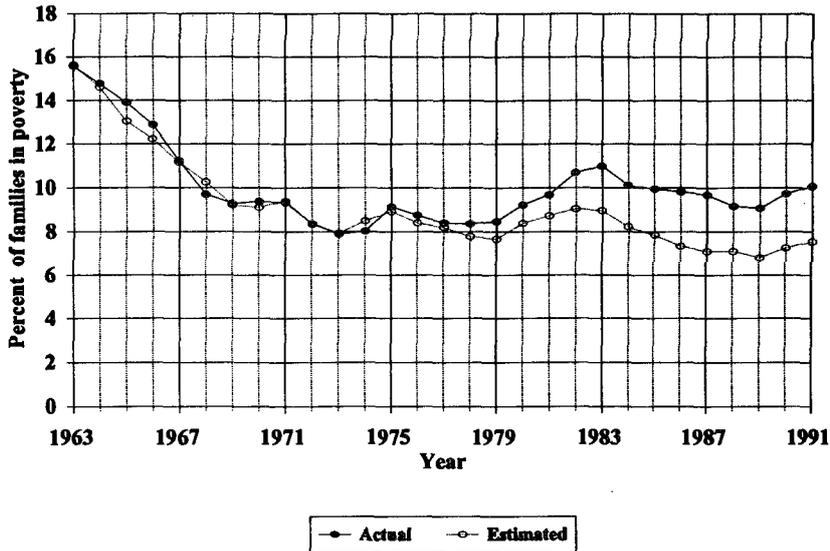


Figure 3. Actual and Estimated Poverty Rates, Assuming Constant Variance

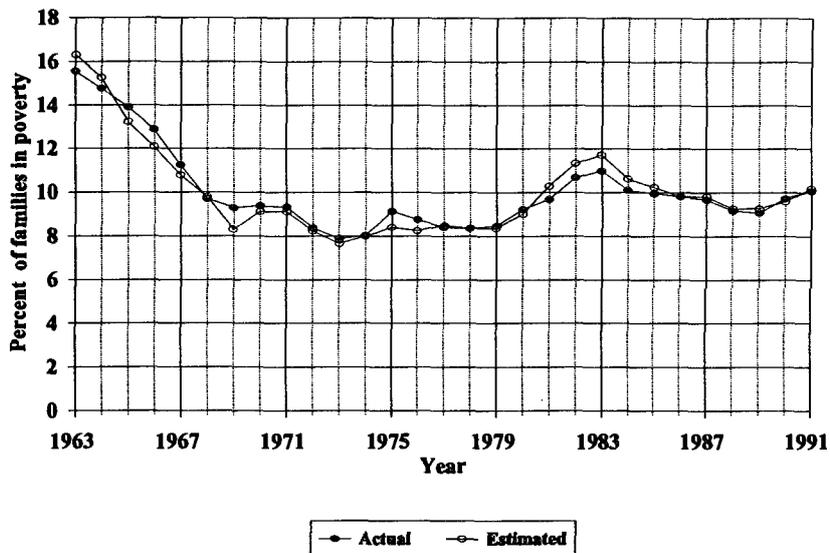


Figure 4. Actual and Estimated Poverty Rates, Using Variable Variance

the poverty rate about three percentage points higher than it would have been otherwise.

### GIVE UP ON TRICKLE DOWN?

Beyond finding that the simple hypothesis of a lognormal income distribution with variable variance is a reasonable descriptor (*ex post*) of the impact of

economic growth on the poverty rate, this exercise has made two points. First, the nonlinearity of the relationship between income and poverty that Anderson observed is not sufficient to explain why poverty rates were so high in the 1980s.

The second point is that changes in inequality are as crucial to changes in the poverty rate as growth in mean income. The 1980s were a powerful reminder that the effectiveness of growth in reducing poverty depends a great deal on how growth is distributed. The rise in inequality offset the poverty-reducing effects of more than two decades' worth of growth: In 1991 the poverty rate was higher than in 1968.

What we think of "trickle down" arguments must depend on what we think will happen to income inequality. Were income inequality (as measured by the variance of log income) to rise as much again as it did in the 1980s, then, other things equal, real median income would have to rise by nearly a quarter relative to its 1991 level for the poverty rate to regain the low it reached in 1973. If inequality were to remain at its 1991 level—reflecting a "regime shift" to a higher level of inequality—a 13 percent rise in median income would be enough to bring poverty down to its 1973 rate. Essentially, the nation would be on a new poverty curve lying above the one shown in Figure 1 and around which actual poverty rates for 1983–91 and future rates would cluster. "Trickle down"—the anti-poverty effect of rising real income—would be about as effective as it was in the late 1960s and early 1970s. If, instead, inequality were reduced to its 1980 level, a mere two percent growth in real median income would bring the poverty rate to an all-time low.

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