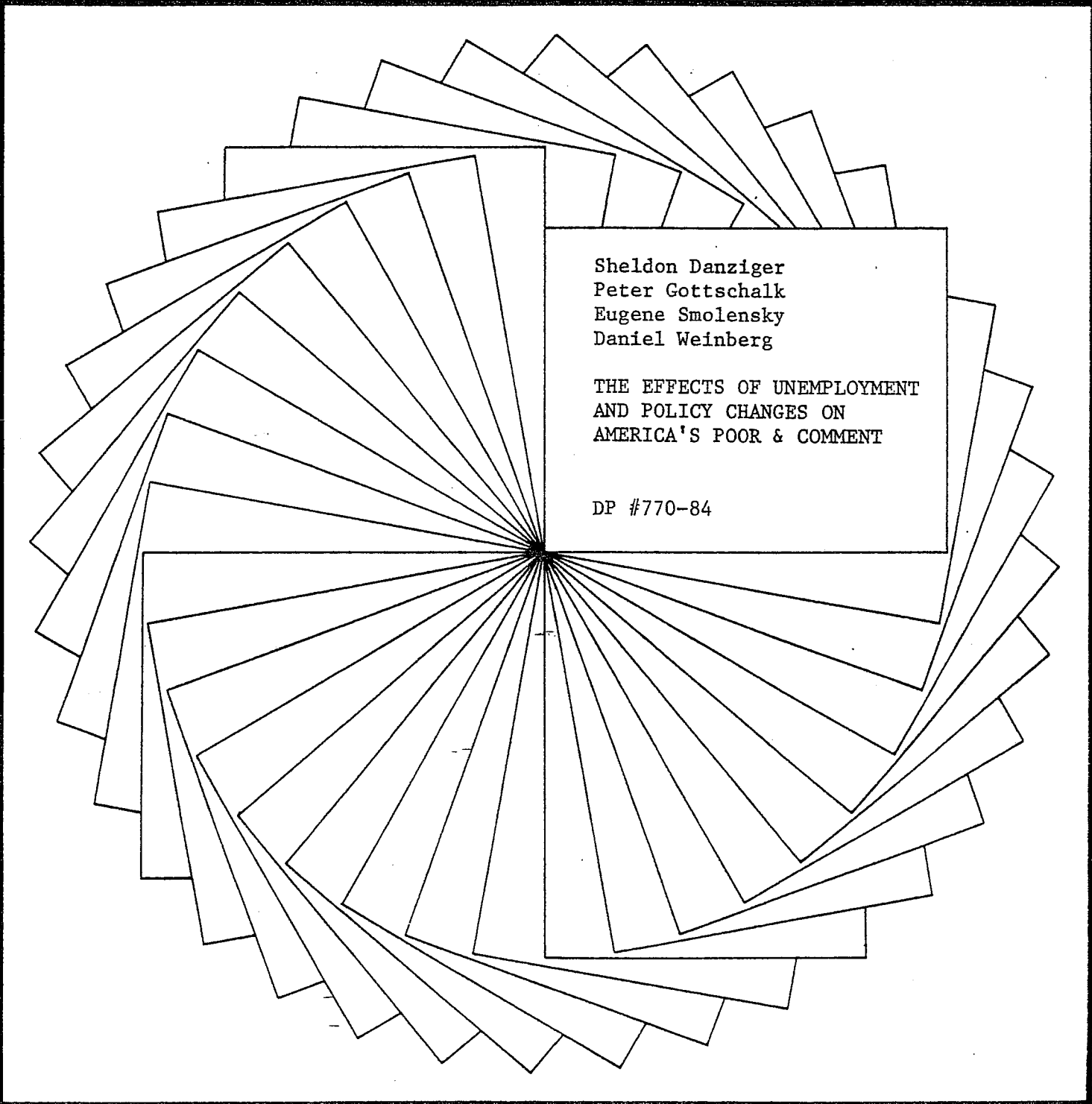

IRP Discussion Papers



Sheldon Danziger
Peter Gottschalk
Eugene Smolensky
Daniel Weinberg

THE EFFECTS OF UNEMPLOYMENT
AND POLICY CHANGES ON
AMERICA'S POOR & COMMENT

DP #770-84

The Effects of Unemployment and Policy Changes on America's Poor*

Sheldon Danziger
Institute for Research on Poverty
University of Wisconsin-Madison

Peter Gottschalk
Bowdoin College

Eugene Smolensky
Department of Economics
University of Wisconsin-Madison

and

Comment

Daniel H. Weinberg
Office of Income Security Policy
U.S. Department of Health and Human Services

*This research was supported in part by funds granted to the Institute for Research on Poverty at the University of Wisconsin-Madison by the Alfred P. Sloan Foundation. Karen Fuller, Michael Kende and Christine Ross provided valuable research assistance and Nancy Rortvedt, valuable clerical assistance. Daniel Feaster, Robert Haveman and Daniel Weinberg provided helpful comments on an earlier draft.

Abstract

First, we employ a methodology that decomposes the change in poverty into changes due to the means and variances of market and transfer incomes and to other factors which affect the shape of the income distribution. We then briefly describe the Reagan economic program. Finally we estimate a regression model that reflects changes in these moments of the income distribution to changes in the unemployment rates and to the Reagan program. The regression estimates, together with the poverty rate decomposition, allow us to show that the Administration's cuts in income transfer programs account for about 40 percent of the recent rise in poverty and that increased unemployment accounts for about a third of the increase in poverty.

The Effects of Unemployment and Policy Changes on America's Poor

It has been a little over three years since President Reagan's economic program was enacted into law. Three years would, under any circumstances, be a short period in which to evaluate a substantial change in the direction of economic policy. (Indeed, some parts of that landmark effort--such as inflation indexing of the personal income tax--do not take effect until 1985.) The actual circumstances have made evaluation more difficult by coincident changes in national unemployment and inflation rates.¹ Any empirical analysis of the Reagan program must separate the effects of mandated changes in tax and transfer programs from secular changes in these programs and changes in macroeconomic conditions.

We begin that task by specifying a descriptive model of the poverty rate which will serve this end. Our methodology involves simulating the effects of secular and cyclical changes in macro conditions on the moments of the joint distribution of market and transfer income. The effect of the programmatic changes introduced by Reagan is treated as a one-time change in each of the moments.

In the next section, we develop a conceptual framework which focuses on the relative effects on poverty of changes in mean market income, mean transfer income, and inequality of incomes.² The algebraic relationships between changes in the moments of the displaced lognormal distribution and changes in poverty are then used to set the Reagan changes into historical perspective. We next describe the economic program introduced by the first Reagan administration. The following section presents a simple regression model of the effects of secular and cyclical changes,

as well as the administration's program, on the factors that determine the location and shape of the income distribution. We then use this regression model to decompose the recent increase in poverty into components due to changes in the unemployment rate and to the Reagan program. The last section draws conclusions.

I. CONCEPTUAL FRAMEWORK

We define the incidence of poverty, P , in terms of the underlying distribution of income:

$$(1) \quad P = \int_0^T \int_0^{T-I_2} g(I_1, I_2, m) dI_1 dI_2.$$

I_1 and I_2 are market and transfer incomes, respectively; T is a poverty threshold that varies with family size; and g is the joint density function of I_1 and I_2 , defined in terms of a vector of parameters, m . The total differential of P with respect to its k parameters is

$$dP = \sum_{i=1}^k \frac{\partial P}{\partial m_i} dm_i.$$

This formulation allows us to decompose the total change in poverty into changes due to each of the k parameters, each of which, in turn, reflects changes in the moments of the distribution.

To quantify the impact on poverty of observed changes in all the moments of the distribution, we specify a particular functional form for g . Our distributional choice is guided by two principles. The function should not be more restrictive than functional forms applied elsewhere in the income distribution literature, and the form should depend on a suf-

ficiently small number of parameters to make empirical work tractable. The displaced lognormal distribution meets these criteria.

We use the official poverty lines as our measure of T and define the income-to-needs ratio of total income as

$$I^* = \frac{I_1 + I_2}{T}$$

Poverty then is defined as a ratio less than one for all families, regardless of size.³ We assume that I^* has a displaced lognormal distribution. The three parameters of this distribution are the mean of total income (α), its variance (β^2), and the displacement factor (c). The displacement factor affects the degree of skewness.

In Gottschalk and Danziger (1985), we derive expressions for the partial derivatives of poverty with respect to α , β^2 , and c . We show there that the total change in poverty, dP , can be decomposed into changes in poverty associated with changes in the means (E) and variance (var) of each income source, their covariance, and the displacement factor:

$$(2) \quad dP = \frac{\partial P}{\partial \alpha} dE(I_1^*) + \frac{\partial P}{\partial \alpha} dE(I_2^*) + \frac{\partial P}{\partial \beta^2} dvar(I_1^*) \\ + 2 \frac{\partial P}{\partial \beta^2} dcov(I_1^* I_2^*) + \frac{\partial P}{\partial \beta^2} dvar(I_2^*) + \frac{\partial P}{\partial c} dc.$$

For example, the impact of increases in transfers will affect poverty not only through the addition to mean transfer income [$dE(I_2^*)$] but also

inasmuch as transfers are more equally provided [$dvar(I_2^*)$] and if transfers become more dependent on earnings [$dcov(I_1^* I_2^*)$].

With time-series data on the displacement factor and the means, variances, and covariance of I_1^* and I_2^* , we can use equation (2) and the three partial derivatives of P to decompose changes in poverty.⁴ In the following section, we apply this methodology to determine the relative importance of each factor in changing poverty over the period 1967 to 1982.

II. THE DATA: HISTORICAL PERSPECTIVE ON THE REAGAN PROGRAM

The data on the underlying moments, shown in columns 1-6 of Table 1, are from the annual March Current Population Surveys (CPS). From these data we calculate sample means, variances, and covariances of I_1^* , which we define as market income (wages, salaries, self-employment income, dividends, interest, rents, private pensions, etc.) measured as a proportion of needs, and I_2^* , cash government transfers (social insurance and public assistance) measured as a proportion of needs.⁵ This sample information is used to calculate estimates of α , β^2 , and c . The means, variances, covariance, and displacement factor are used to calculate the partial derivatives in each year, shown for selected years in columns 7-9. Columns 10 and 11 show the actual poverty and unemployment rates, respectively.

The data in Table 1 are all that is necessary to implement our decomposition of changes in poverty. For example, from 1982 to 1983 mean market income and mean transfers (each measured as a proportion of needs) increased by .052 and .004 respectively. Adding these two com-

Table 1

Moments, Displacement Factors, Partial Derivatives, Poverty Rate
and Unemployment Rate^a

	Mean		Variance		Covariance of Market Income and Transfers (5)	Displacement Factor (6)
	Market Income ÷ Needs (1)	Transfer Income ÷ Needs (2)	Market Income ÷ Needs (3)	Transfer Income ÷ Needs (4)		
1967	2.545	0.154	4.336	.137	-.175	0.254
1968	2.673	0.170	4.666	.155	-.195	0.347
1969	2.793	0.173	5.191	.153	-.209	0.372
1970	2.749	0.197	5.201	.179	-.229	0.387
1971	2.759	0.219	5.373	.210	-.261	0.402
1972	2.923	0.239	6.005	.245	-.300	0.620
1973	2.986	0.256	6.112	.283	-.331	0.691
1974	2.846	0.276	5.424	.305	-.341	1.010
1975	2.755	0.313	5.253	.336	-.365	0.905
1976	2.846	0.310	5.525	.354	-.388	0.976
1977	2.918	0.308	5.837	.358	-.399	1.012
1978	3.006	0.307	5.907	.379	-.404	1.363
1979	2.988	0.305	5.761	.376	-.377	1.475
1980	2.814	0.313	5.207	.373	-.349	1.573
1981	2.792	0.308	5.685	.375	-.341	1.166
1982	2.769	0.327	5.950	.404	-.334	1.167
1983	2.821	0.331	6.093	.419	-.363	1.546

	Partial Derivatives with Respect ^b to:			Official Poverty Rate (10)	Unemployment Rate (11)
	Means (7)	Variances (8)	Displacement (9)		
1967	—	—	—	.143	3.8
1968	-0.216	0.037	0.053	.128	3.6
1969	-0.194	0.032	0.052	.122	3.5
1970	-0.193	0.031	0.054	.126	4.9
1971	-0.191	0.030	0.052	.125	5.9
1972	-0.182	0.029	0.045	.119	5.6
1973	-0.164	0.026	0.039	.111	4.9
1974	-0.180	0.030	0.036	.123	5.6
1975	-0.170	0.030	0.031	.123	8.5
1976	-0.169	0.030	0.030	.118	7.7
1977	-0.161	0.028	0.030	.116	7.1
1978	-0.161	0.029	0.025	.114	6.1
1979	-0.153	0.027	0.023	.117	5.8
1980	-0.166	0.030	0.022	.130	7.1
1981	-0.160	0.027	0.025	.140	-7.6
1982	-0.178	0.028	0.029	.150	-9.7
1983	-0.184	0.030	0.022	.152	9.6

Table 1, continued

Source: For columns (1)-(10), computations by authors from March Current Population Surveys; for column (11), Economic Report of the President.

^aThe official poverty line, which we use to transform the income distribution into the income-to-needs distribution, is adjusted each year to reflect changes in the consumer price index. Thus, the data shown are in real terms.

^bThe derivative is applicable to the change in the moments between the indicated year and the previous year.

ponents of mean income and multiplying the sum by $-.184 \left(\frac{\partial P}{\partial \alpha} \right)$, shown in column 7), shows that changes in the mean of the income/needs distribution (the first two terms in equation 2) decreased poverty by .010 (i.e., 1.0 percentage point). Hence poverty would have dropped by 1 percentage point instead of increasing by 0.2 percentage points if only the means had changed. The impact of changes in the variances, covariance, and displacement factor on poverty are obtained by repeating the calculations for the other terms in equation (2). When all of these terms are summed, they equal the observed 0.2 point increase in poverty from 1982 to 1983.

Changes in the mean market-income-to-needs ratio (column 1) indicate the severity of the last downturn. The mean fell each year between 1978 and 1982, and the cumulative decline was almost 8 percent (from 3.006 to 2.769). Indeed, this measure in 1982 was below its 1969 level. There were only two previous periods in which mean market incomes fell in as many as two successive calendar years--1969 to 1971, when the decline was less than 2 percent, and 1973 to 1975, when it was almost 9 percent. The United States was, then, two years into a severe economic downturn when the Reagan tax and budget cuts took effect.

Column 4 shows the rapid increase in the rate of growth of mean transfers from the late 1960s to the mid-1970s. Expressed as a percentage of needs, transfers doubled between 1967 and 1975. The rate of growth of transfers began to level off by the late 1970s. Nonetheless, reducing their growth rate even further was a major goal of the Reagan administration. Because of their countercyclical nature, however, transfers as a percentage of needs rose rapidly from 1981 to 1982.

The decline in total income was halted in 1983. The mean of the market-income-to-needs ratio increased by 1.9 percent and the transfer ratio rose by 1.0 percent. Nonetheless, poverty continued to rise.

Table 1 highlights two other aspects of the effect of growth and recession on the incidence of poverty. It has been understood for some time that the partial derivative of poverty with respect to mean market income declines with persistent growth (Anderson, 1964; Aaron, 1967). This declining poverty reduction in relation to rising mean income comes about because the poverty line, which is fixed in real terms, moves down the left-hand tail of the size distribution of income when the mean increases. That is, equal absolute increases of the mean, with the shape of the distribution unchanged, will have less and less impact on poverty. As column 7 reminds us, however, during recessions that process is reversed. By 1983, the poverty line intersected the income distribution where it was more dense than the intersection in 1972. *Ceteris paribus*, then, as we come out of the recession, gains against poverty should be relatively rapid.

Column 6, the displacement factor, indicates that as mean income increased, the income distribution did not simply glide to the right. Some part of the distribution was anchored at around zero, so that in the period after 1967 the distribution became increasingly unequal and skewed to the left. The coefficient of variation of market incomes was higher in 1982 and 1983 than in any other year since 1967. In our decomposition, this effect shows up as an increase in income inequality, which partially reduces the impact of growth in market and transfer incomes on poverty.

Table 2 summarizes our computations using the data in Table 1. We decompose the change in poverty for the 1968-83 period, and for sub-periods corresponding to the Nixon, Nixon-Ford, Carter and Reagan administrations. The actual change in poverty in percentage points is shown in column 1. Column 2 shows the impact on poverty of proportional changes in each household's mean market income, holding the coefficient of variation and the coefficient of skewness of market income constant. It can, therefore, be interpreted as the effect of changes in the mean, holding relative inequality constant.⁶ Column 3 shows the corresponding impact on poverty of changes in mean transfer income. The last column shows the impact of the remaining factors which change the shape of the distribution--deviations of the variance, covariance and displacement factor from the values consistent with proportional growth in each household's market and transfer income. This grouping reflects our interest in the relative effects on poverty exerted by economic growth, transfer growth and changes in inequality.

Row 1 of Table 2 shows that the official poverty rate for all persons increased by 2.4 percentage points between 1968 and 1983. Column 2 shows the effect of increases in the mean of market income (holding the shape of the distribution constant). This reflects the poverty-reducing effects of increases in mean market income and the poverty-increasing effects of increases in the variance, and the effects of changes in the covariance and displacement factor, all resulting from proportional growth in the market income of each household. The net effect was a decline of poverty of 1.1 percentage points between 1968 and 1983.

Table 2
Decomposition of Changes in Poverty Among All Persons

	Actual Percentage Point Change in Poverty ^a (1)	Mean Market Income- to-Needs Ratio ^b (2)	Mean Transfer Income- to-Needs Ratio ^b (3)	Shape of Distribution (4)
1968-83	+2.4	-1.1	-3.7	+7.2
1968-72	-0.9	-1.8	-1.6	+2.5
1972-76	-0.1	+0.5	-1.7	+1.1
1976-80	+1.2	+0.2	-0.1	+1.1
1980-83	+2.2	+0.0	-0.3	+2.5

Source: See Table 1.

^aThe sum of the changes in columns 2, 3 and 4 is equal to the actual change in column 1.

^bComputed on the assumption that higher level moments change in such a way that the coefficients of variation and skewness all remain constant.

See note 6.

Increases in mean transfers were a more significant factor; they decreased poverty by an additional 3.7 points.

These two poverty-reducing factors were offset by changes in the shape of the distribution, which increased poverty by 7.2 points. This has been widely recognized, but not well explained. It is in part due to demographic shifts in household composition, increased labor force participation of women, and increased inequality even among fully employed men (Danziger, 1982; Dooley and Gottschalk, 1984). If success is defined in terms of reducing poverty with the smallest possible increase in transfers then the Nixon years stand out. Increases in market incomes reduced poverty by 1.8 points, increases in transfers were slightly less important. In all other subperiods, changes in mean market income actually increased poverty.

Between 1980 and 1983, poverty for all persons increased from 13.0 to 15.2 percent, an increase larger than that for any of the presidential administrations. Mean market income, which was about the same in 1983 as in 1980, had no effect on poverty. The poverty-reducing impact of growth in mean transfers--0.3 points--was much smaller in this period than in the 1968 to 1976 period, but larger than in the Carter years. This reflected cyclical changes in transfers rather than any increase in real program benefits. Changes in the shape of the distribution increased poverty by a large amount, 2.5 points, since poverty increased while mean income actually increased.

So far our model has allowed us to account for the sources of change in poverty. We want, however, to attribute these changes to the

unemployment increase and the federal policy changes. It is to this task that we now turn.

III. THE REAGAN PROGRAM

In our empirical work we will represent the administration's economic program by a dummy variable, since the data are not available to construct a more complex model. It is important, therefore, that we describe here the complex nature of the program that will be so summarily represented. The Reagan program sought to achieve four specific goals: a substantial cut in personal income tax rates, a cut in nondefense expenditures as a proportion of GNP accompanied by an increase in the outlays for defense, a reduction in the regulatory burden on business, and maintenance by the Federal Reserve of its monetarist policies. Taken together, "the overriding objective [of these goals] was to reduce both the absolute and relative size of the federal government" (Kimzey, 1983, p. 44). The major mechanisms for reaching this objective were the Omnibus Budget Reconciliation Act (OBRA) and the Economic Recovery Tax Act (ERTA), both of which were passed at the end of the summer of 1981. The tax changes involved a revenue loss to the federal government from individuals of \$377 billion over the 1982-85 period. Spending cuts were much smaller--they reduced outlays to persons by \$66 billion over the same period. Moreover, total spending rose, because of the large increases in defense expenditures.

In addition to reducing the size of government, the president's program sought to alter the distributional effects of taxes and transfers. Tax changes involved proportional cuts in personal income tax

rates of 25 percent over three years and inflation indexing, to begin in 1985. The tax cuts were, however, not strictly proportional, since the Earned Income Tax Credit was not adjusted and the highest marginal bracket was reduced from 70 to 50 percent immediately. The maximum rate on long-term capital gains was lowered; and corporate income tax revenues were cut by no less than a third. The estate tax and the gift tax were reduced substantially.

While tax cuts were indeed substantial, in part they were cuts relative to tax increases that would have resulted from existing law.⁷ For example, the ratio of federal taxes to GNP will have fallen by 10 percent between 1981 and 1986 (from 20.9 to 18.8 percent), when in the absence of the Reagan administration's changes, the ratio would have risen by about 7 percent (to 22.4 percent). In the aggregate, some of the tax cuts offset otherwise deflationary tax increases, such as those scheduled for the social security tax. The distributional effects of the cuts were not neutral. Levy and Michel (1983) show that the bottom 40 percent of all families will actually pay higher direct taxes as a percentage of incomes in 1984 than in 1979. And a study for the House Ways and Means Committee shows that the real tax burden of a typical family with earnings at the poverty level increased threefold (by \$499) between 1980 and 1984 (U.S. House of Representatives, 1984).

The budget cuts were designed to reduce the ratio of federal spending to GNP. This ratio increased from 18 to 23 percent between 1965 and 1981. The cuts that were legislated (other than elimination of a proposed pay raise for government workers) came almost entirely from working low-income households, since they were made primarily in such areas as food and nutrition, aid to single-parent households with children, public

service jobs and training programs, and medical aid to the indigent. (Remaining cuts were equal to about one-half the reduction in the major food program alone.) In spite of the cuts, federal spending as a percentage of GNP actually increased because of the recession. It is still expected to exceed 23 percent through fiscal year 1986.

The first two columns of Table 3 show the actual 1965 outlays for the major cash transfer programs and their projected 1985 levels if pre-Reagan policies were still in place. Columns 3 and 4 show the proposed and enacted Reagan budget cuts. Reagan got about half of the cuts he proposed. Income tested (welfare) spending was reduced by about 13 percent. The total decline was about 6 percent, since social security, the largest program by far, was cut relatively little. Spending levels in 1985 are obviously still far above their 1965 levels for most of the programs and for total transfers. However, for some programs, such as Aid to Families with Dependent Children (AFDC), benefits per recipient had fallen to their values of the late 1960s.

The philosophy behind the cuts in transfer programs was to transform certain income security programs from a general support system encouraging simultaneous receipt of wages and welfare to a "safety net" that forced a choice between work and welfare. Generally speaking, those who did not work lost only a small portion of their benefits. The biggest losers were the "working poor" and not the "poorest of the poor," who were already out of the labor force. For example, the U.S. House of Representatives, Committee on Ways and Means (1984) reports that in 1980, 46 states would have provided cash welfare (AFDC) benefits to a woman with two children and earnings at 50 percent of the poverty line; by 1984, only 24 would have provided such benefits. For a woman with wages

Table 3

Major Cash Transfer Programs, 1965 and 1985

Program	Actual 1965 Outlays ^a (1)	Projected Outlays Pre-Reagan Policy ^a (in \$ billions) (2)	Proposed Reagan Changes as Percentages of Baseline (3)	Enacted Reagan Changes of Baseline (4)
Social Security	\$56.9	\$200.6	-10.4%	-4.6%
Veterans' Compensation	7.6	10.7	-8.4	-0.9
Veterans' Pensions	6.6	3.8	-2.6	-2.6
Supplemental Security Income (SSI) ^b	9.3	8.1	-2.5	+8.6
Unemployment Insurance	8.6	29.8	-19.1	-17.4
Aid to Families with Dependent Children (AFDC)	5.9	9.8	-28.6	-14.3
Totals	94.9	262.8	-11.6	-6.2

Source: For column 1, Danziger, Haveman and Plotnick (1981), p. 977; for columns 2-4, Palmer and Sawhill (1984), p. 185.

^aFiscal year data in 1985 dollars. Fiscal year consumer price index was .936 for 1965 and is projected to be 3.229 for 1985.

^b1965 figure is for the predecessors of SSI—state-run programs for the aged, blind, and disabled.

equal to three-quarters of the poverty line, the number of states paying AFDC dropped from 37 to 6. In addition, the latter woman had a negative federal tax burden in 1980 (payments from the Earned Income Tax Credit exceeded the sum of the social security and personal income taxes), but a positive burden in 1984. In 1980, this woman's disposable income would have been 108 percent of the poverty line, while by 1984 it would have dropped to 92 percent.

Even supporters of the Reagan program conclude that the budget cuts increased poverty in the short run. They emphasize, however, the importance of supply-side effects. The tax cuts are intended to increase work effort and savings, and hence foster economic growth. Growth is considered an antipoverty strategy that can improve the market income of the poor directly and raise the income of the nonpoor sufficiently to produce future additional revenues that can be used for public programs. For example, Boskin (1982) concludes that the long-run result will be "an environment in which economic mobility for the disadvantaged and minorities is maximized" (p. 31), even though "the Reagan program will lead to a more unequal distribution of income than would have resulted from a continuation of previous programs" (p. 44).

The changes in taxes and in social and military spending enacted in 1981 combined with the recession to produce deficits that will, under present circumstances, remain above 5 percent of GNP through the late 1980s. The large deficits and public reaction to previous cuts in social programs led to a retreat by Congress from the path planned by the president for the next several years. Expenditures were cut by less than the president requested in fiscal years 1983-85, and some taxes were

increased despite presidential opposition. Thus, the observed poverty increases have been smaller than if the president had had his way.

The mix of monetary and fiscal policy chosen by the administration may also have increased the incidence of poverty. In contrast with the administration's early 1981 optimistic forecast, the slide in the economy that began before Reagan took office accelerated in 1982. Unemployment reached 10.7 percent in late 1982, the highest rate since the Great Depression. Inflation began to fall as the recession deepened. By 1984, however, the recovery was firmly in place. Unemployment fell to 7.5 percent without an accompanying increase in inflation.

We draw several conclusions from this brief description of the Reagan program. First, simulating all of the details of the program would be extremely difficult. Second, the data with which to measure the long-run effects of the program on poverty are not yet available. We currently have data only for three years of the Reagan presidency.

In the interim, however, we use our decomposition of the poverty rate and a simple econometric model in which the president's program is represented by a dummy variable to partition the recent increase in poverty into components due to changing macro conditions and programmatic changes.

IV. ESTIMATES OF THE EFFECTS OF THE REAGAN PROGRAM ON POVERTY

We begin with a model that includes separate regressions to control for cyclical and secular changes in each of the six moments in equation (2). This allows us to isolate the extraordinary changes in each of the moments during the Reagan years. These regressions, quite similar to

those used by Blinder and Esaki (1978) to analyze the income share of each quintile of families, take the following reduced form:

$$(3) \quad \ln Y_{it} = \alpha_{0i} + \alpha_{1i} U_t + \alpha_{2i} \text{Prod}_t + \alpha_{3i} D_t + \varepsilon_t,$$

$$\begin{aligned} i &= 1, 2, \dots, 6 \\ t &= 1967 \dots 1983 \end{aligned}$$

where

$Y_1 = E(I_1^*)$, the mean of market income divided by needs,

$Y_2 = \text{Var}(I_1^*)$, the variance of market income divided by needs,

$Y_3 = E(I_2^*)$, the mean of transfer income divided by needs,

$Y_4 = \text{Var}(I_2^*)$, the variance of transfer income divided by needs,

$Y_5 = \text{cov}(I_1^*, I_2^*)$, the covariance of market and transfer incomes,

$Y_6 = c$, the displacement factor,

U = civilian unemployment rate,

Prod_t = output per hour of all persons in the nonfarm business sector,

D = a dummy variable that equals 1/4 in 1981 and 1 in 1982 and 1983, a proxy for the effects of Reagan's program,

ε = a random error term, which may be autocorrelated.

We attribute all noncyclical and nonsecular changes in the moments to the administration's program through the dummy, D . We set this dummy equal to 1 in 1982 and 1983, but only to 1/4 in 1981, because the tax and budget cuts were unlikely to have affected behavior prior to the fourth quarter. Because the CPS data are available only through 1983, we use this crude proxy to measure Reagan's programmatic changes rather than specify a formal structure. For example, one might include the marginal tax rate in the personal income tax in the equations for the mean and variance of market income or the income guarantees and marginal tax rates

in welfare programs in the transfer income equations. We do not, however, think that the 17 available years of data, of which the Reagan program can be responsible for no more than two and a quarter years, would support a more complex model.

The dummy does represent a more realistic counterfactual against which to measure the effects of the Reagan program than the counterfactual implicit in many simulation studies. In the past, changing macro conditions have led to legislative adjustments in a large number of policies. Taken one at a time, these changes would appear to be ad hoc. Viewed over time, however, these adjustments show a certain degree of commonality. One advantage of our approach is that the consistent component of past legislative reactions to macro changes is captured in our coefficients on unemployment and productivity growth. Our second advantage is related to the first. Just as legislative changes that were not initiated in the Reagan period but would have been undertaken by other administrations are omitted in most simulations, those same simulations almost always omit a large number of programmatic changes that were in fact made. The latter omission may be because the individual changes were small or because there were no relevant historical data available. Again, our methodology captures these changes. In sum, although our methodology is imprecise about particular programmatic changes, it is complete.

Both of these advantages may be better understood by considering the Levy-Michel study (1983), one of the best microsimulation analyses of the Reagan program. They measure the effects of program changes relative to a pre-Reagan year, 1979, or relative to the pre-Reagan baseline estimates produced by the Congressional Budget Office (CBO). Consider how

unemployment insurance (UI) enters their calculations. Benefits in a post-Reagan year are compared to what they would have been had pre-Reagan laws remained unchanged. But Burtless (1983) has shown that while about three-quarters of the unemployed were covered by UI in fiscal year 1976, only 42 percent were covered in fiscal 1982. If fiscal 1976 is used as the counterfactual, then UI expenditures in fiscal 1983 were lower by 34 percent. However, if the CBO fiscal 1981 baseline is used, expenditures were only about 10 percent lower. For 1982, our dummy variable in each of the six equations will capture the effects on the moments of deviations from what would have been expected on the basis of the pre-Reagan experience and the actual 1982 macro conditions.

The second problem of microsimulations--data unavailability for many programmatic changes--is exemplified in Levy and Michel's inability to estimate the redistributive effects of the elimination of 300,000 public service employment positions. Our dummy variable will also capture the extent to which job availability for lower-skilled workers differs from what it would have been in 1982 had historical relationships prevailed.

These advantages of the dummy variable approach are merely restatements of the fact that it attributes all noncyclical and nonsecular changes to Reagan. Nonetheless, the obvious problem with the dummy variable is that there may have been other forces beyond Reagan's control which may also have affected the moments of the distribution, and hence poverty. We have no way of separating these other factors from the direct impact of the programmatic changes.

Once we have estimated the six regressions in equation (3), we specify a set of counterfactual assumptions, generate estimates for each of the six moments, substitute those estimates into equation (2) and thereby

produce the expected poverty rate for the counterfactual. For example, we know that poverty in 1983 was 15.2 percent. What would it have been if unemployment had been at its 1980 level of 7.1 percent rather than at the actual 1983 level of 9.6 percent? For each of the six equations, we compute $\ln \hat{Y}_{11983} = \ln Y_{11983} + \hat{\alpha}_{11} (-2.5)$, where $\hat{\alpha}_{11}$ is the estimated coefficient and the value in parentheses represents the actual percentage point change in unemployment. We then use the six estimated values for \hat{Y}_{11983} to determine the 1983 poverty level, given the 1980 unemployment rate.⁸

Since equation 3 is used simply as a way of estimating the non-cyclical or secular changes in the moments, alternative specifications might be equally plausible. We therefore test the robustness of our results by using an alternative set of specifications which we contrast with what we will call the basic specification shown in equation 3. We first provide an explanation of the procedure for the basic specification and then summarize results for the alternative specifications.

The regression coefficients for the basic specification are shown in Table 4. Each regression was estimated with a maximum likelihood estimator to test for first order autocorrelation and, when ρ is significant, to correct for autocorrelation. Because the equations represent a reduced form, we do not want to overemphasize the resulting coefficient estimates. Nonetheless, the coefficients generally have expected signs. For example, increased unemployment (row 2) reduces the mean and variance of market incomes, and increases the mean and variance of transfers. The Reagan program (row 4) increases the mean and variance of market income,

Table 4

The Effects of Macroeconomic Conditions and the Reagan Program on the Factors that Determine the Location and Shape of the Income Distribution, 1967-1983^a

Independent Variables	Mean Market Income ÷ Needs (1)	Variance (Market Income ÷ Needs) (2)	Mean (Transfers ÷ Needs) (4)	Variance (Transfers ÷ Needs) (4)	Covariance of Market Income and Transfers (5)	Displacement Factor (6)
Constant	.266 (1.5)	.055 (0.1)	-4.53 (15.2)	-6.484 (15.5)	-4.280 (8.0)	-9.289 (8.3)
Unemployment Rate	-.019 (3.8)	-.025 (2.1)	.065 (4.5)	.061 (3.0)	.015 (1.2)	.019 (0.3)
Productivity ^b	.009 (4.7)	.186 (4.2)	.029 (7.7)	.051 (9.6)	0.31 (5.5)	0.95 (6.7)
Reagan Program Dummy Variable ^c	.023 (0.7)	.118 (1.8)	-.226 (3.9)	-.224 (2.8)	-.103 (1.3)	-.250 (1.2)
Adjusted R ²	.951	.895	.955	.960	.903	.885
Rho ^d (ρ)	.813 (5.7)	.794 (5.4)	n.a.	n.a.	.907 (10.7)	n.a.
Mean of Dependent Variable (natural log)	1.037	1.701	-1.355	-1.277	-1.184	-.255

Note: t-statistics appear below coefficients in parentheses, a t-value greater than 1.76 indicates significance at the 90 per cent level.

^aThe natural log of the six moments of the distribution are the dependent variables.

^bOutput per person hour in the nonfarm business sector.

^cDefined as 1/4 in 1981 and 1 in 1982 and 1983.

^dWhen rho was insignificant the equation was estimated using OLS and the value of rho is given as not applicable (n.a.).

but only the effect on the variance is significant. Its effect on the mean and variance of transfers is negative, and significant.

The coefficients from Table 4 are used to simulate the six moments and the poverty rates for several counterfactuals. The first two rows of Table 5 show the actual values for 1980 and 1983 for the (unlogged) means of market and transfer incomes and their sum, the unemployment rate, and the poverty rate. The next three rows show the simulated values for the 1983 income means and poverty rate that result if the unemployment rate in 1983 had been at its 1980 level. Row 3 simulates only the unemployment rate change. Row 4 also "turns off" the Reagan program effects on the mean and variance of transfer income. Row 5 "turns off" the Reagan shifts in all of the six moments, while row 6 keeps the Reagan dummy variable "off" and eliminates the impact of both unemployment and productivity change between 1980 and 1983.

These simulations allow us to decompose the 2.2 percentage point increase in poverty between 1980 and 1983 into components due to changing unemployment rates, to productivity growth, and to the noncyclical, non-secular changes we attribute to the Reagan program. The residual results from any unexplained residual for 1983 in the six regressions. Our decomposition is as follows:

• Actual change in poverty (line 2 - line 1)	+2.2 points
• Poverty change due to changing unemployment rate (line 2 - line 3)	+0.7 points
• Poverty change due to Reagan shift in mean and variance of transfers (line 3 - line 4)	+0.9 points
• Poverty change due to Reagan shift in the other four moments (line 4 - line 5)	+0.3 points
• Poverty change due to change in productivity (line 6 - line 5)	-0.1 points
• Residual (by definition)	+0.4 points

Thus our basic model attributes about 32 per cent (0.7/2.2 points) of the increase in poverty to changes in unemployment. We make no effort to determine how much of this is a result of Reagan's macro policy as opposed to the Federal Reserve's monetary policy. Shifts in the mean and variance of transfers during the Reagan administration account for an additional 0.9 point increase, or 41 per cent of the 2.2 point rise. The basic model, therefore, attributes about equal importance to increased unemployment and transfer changes. Shifts in the other four moments and the effect of productivity changes had substantially smaller impacts (0.3 point and -0.1 point, respectively).

Table 6 shows the sensitivity of these results to the specification of the regressions. Since these equations are simple descriptive devices which take out cyclical and secular changes in the moments, leaving only extraordinary changes during the first three years of the Reagan administration, alternative specifications are equally defensible. We experiment with two alternatives. The first replaces productivity with a

Table 5

Reagan, Recession, and Poverty, 1980-1983

	Means			Unemployment Rate (4)	Poverty Rate (5)
	Market Income ÷ Needs (1)	Transfer Income ÷ Needs (2)	Total Income ÷ Needs (3)		
1. Actual 1980	2.814	0.313	3.127	7.1%	13.0%
2. Actual 1983	2.821	0.331	3.152	9.6	15.2
3. Simulated 1983; unemployment at 1980 level	2.961	0.281	3.242	7.1	14.5
4. Simulated 1983; unemployment at 1980 level, and no Reagan shift in the mean and variance of transfers	2.961	0.352	3.313	7.1	13.6
5. Simulated 1983; unemployment at 1980 level, and no Reagan shift in any of the 6 moments	2.895	0.352	3.247	7.1	13.3
6. Simulated 1983; productivity and unemployment at 1980 levels, and no Reagan shift in any of the 6 moments	3.043	0.413	3.456	7.1	13.4

Table 6

Sensitivity of Results to Specification of Regression

	Basic Results (1)	Same as (1), but Replace Productivity Variable with Year (2)	Same as (1), but Replace Dummy Variable with Spline (3)
Actual Change in Poverty.	+2.2 points	+2.2 points	+2.2 points
<u>Change Due to Change in:</u>			
Unemployment rate	+0.7	+1.0	+0.8
Mean and variance of transfers	+0.9	+0.5	+0.9
Changes in the other four moments	+0.3	-0.5	+0.4
Secular trend (productivity over time)	-0.1	-0.2	+0.0
Residual (by definition)	+0.4	+1.4	+0.1

simple linear time trend. Since productivity does have a cyclical component and since Reagan may be responsible for some of the increases in productivity, it may be preferable to use this alternative. The second alternative is to replace the Reagan-era shift terms with splines which take on the values of $1/4$ in 1981, $1-1/4$ in 1982 and $2-1/4$ in 1983. This captures the effect of the Reagan program on the growth rate rather than the level of each of the moments.

Comparing values across the rows in Table 6 indicates that attempts to isolate a Reagan-era effect with only three years of data is a difficult task. The results for changes in the unemployment rate and secular growth are fairly robust. Changes in unemployment account for as little as 0.7 point and as much as a 1.0 point. Productivity or the time trend account for very small decreases in poverty. We get somewhat less robust results for the impact of changes in the mean and variance of transfers. These account for between 0.5 and 0.9 point of the 2.2 point increase. It is, however, the Reagan shifts in the other four moments which are very sensitive to our seemingly minor alterations in specification. Our estimates range from -0.5 to $+0.4$.

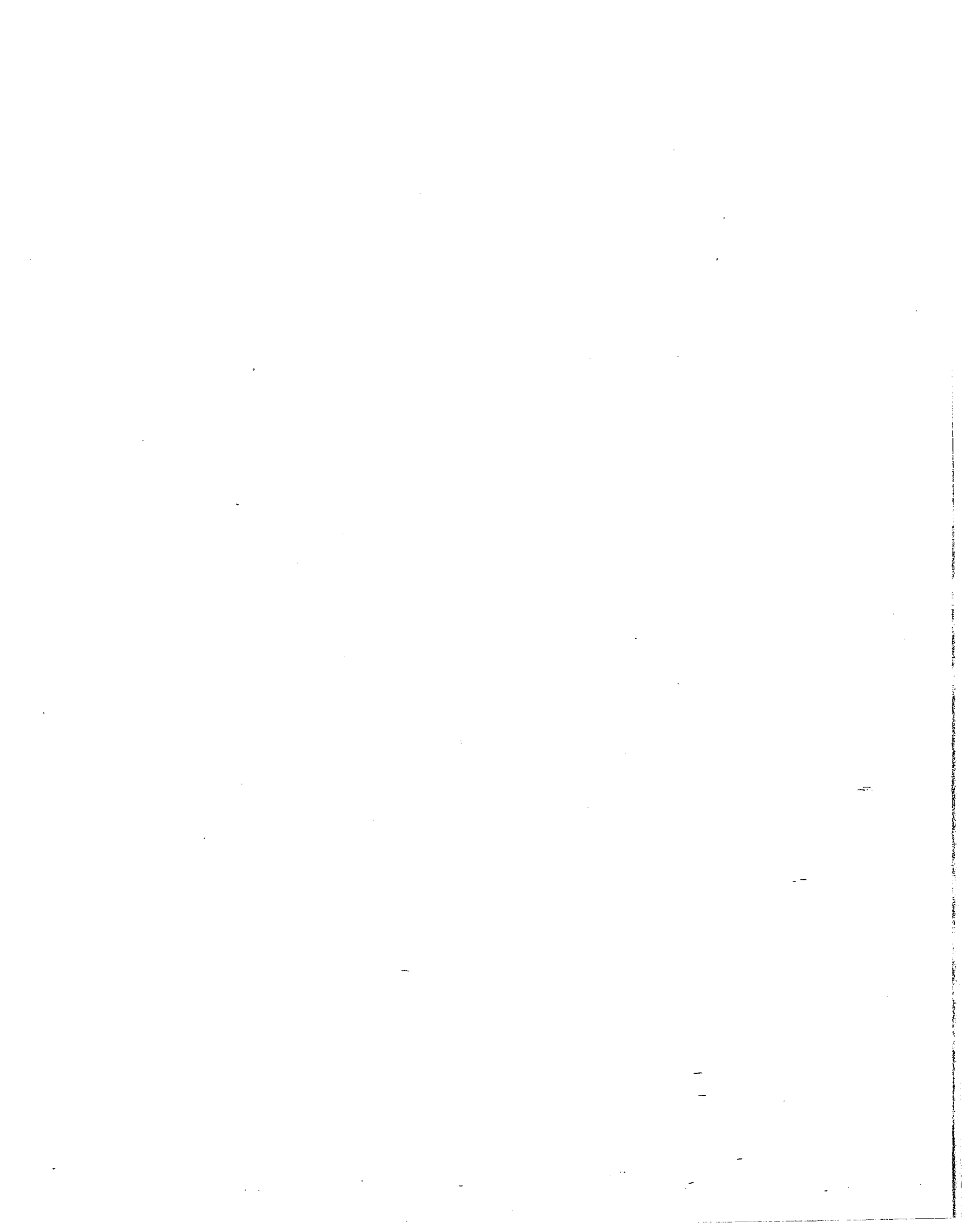
Our limited ability to disentangle the impacts of cyclical, secular and programmatic shifts on poverty with three years of data on the Reagan years is troublesome. It raises the more fundamental question of whether it is possible to determine the overall impact of any president's program in time for the next election. Since data takes time to collect, we will never have four years of data in any public policy area. With yearly data, we have only three data points and many more than three possible explanations for any changes. Only by imposing some structure is it even

possible to disentangle the various causes. What we have seen in this paper is that even with structure, the results are not definitive.

Note also that although the direct effect of the Reagan program was to increase poverty, it also increased mean incomes. The mean of market income to needs is about 2.3 per cent higher in 1983 under the Reagan program, holding unemployment constant, than it would have been without it (see Table 5: 2.961 in line 3 vs. 2.895 in line 5). Just as the president's supporters predicted, both average incomes and inequality increased.

V. CONCLUSION

The Reagan administration's program represents a clear departure from the policies of the past twenty years, policies that partly reflected the view that public expenditures should directly assist the poor. The Reagan approach is that public transfers for the working poor should be decreased to offset the deficits caused by tax cuts and increased defense spending.⁹ Our simulations show that the effects of transfer program changes increased poverty by about the same amount as did the increased unemployment. But while the increased poverty due to the higher unemployment rate will be mostly reversed by the end of 1984, when the unemployment rate will have returned to its 1980 level, the effects of transfer program changes are likely to persist.



NOTES

¹For example, Sawhill and Stone (1985) suggest that because "the adverse shocks that drove inflation to double digit rates in the late 1970s would have been reversed regardless of policy," the Reagan program should not receive all the credit for the observed decline in inflation. The administration takes more credit for the decline in inflation and less for the rise in unemployment.

²Regression analysis of the poverty rates themselves offers an alternative approach. However, Gottschalk and Danziger (1984) show that the analyses common in the literature do not provide a reliable method of obtaining estimates of the partial effects of growth in market and transfer incomes. The time series data do not yield robust results. Minor changes in functional form or variable measures substantially alter the conclusions. Previous studies such as Anderson (1964), Galloway (1965, 1967), Aaron (1967), and Thornton et al. (1978) also suffer from two sources of specification bias. First, the relationship between changes in mean market income or mean transfer income and poverty is nonlinear, and they assume linearity. Second, changes in higher level moments of market and transfer incomes, which they ignore, also affect the poverty rate.

³This transformation simplifies the algebra so that the bound of integration does not vary with family size. In 1983, the official poverty threshold ranged from \$5061 for a single-person household to \$20,310 for a family of nine or more. It was \$10,178 for a family of four. The equivalence scale implicit in this threshold is constant over time. However, the poverty levels for each family size are adjusted each

year to reflect changes in the Consumer Price Index. Dividing incomes by these poverty lines has the additional advantage of converting each year's data into real terms.

⁴The differentials in equation (2) are approximated by finite changes in each parameter. The partial derivatives, which are solely functions of α , β^2 , and c , are evaluated at the average values for these parameters for each pair of years.

⁵Our preference would be to include the value of in-kind income for both income sources and to use a poverty measure which reflects this noncash income. This was not done because Current Population Survey data tapes with the value of in-kind transfers are not generally available.

⁶We begin with initial-year values for the means and the second and third level moments (including the covariances and corresponding third level cross-products). We then assume that each household's market and transfer income-to-needs ratios grew at the same rates as the observed increases in the means of the two income sources and calculate values of the second and third level moments consistent with these proportional growth rates. This ensures that the coefficient of variation and coefficient of skewness of each income source remain constant. Note that total income inequality will change when each income source grows proportionally unless each grows at the same rate. The data in column 4 are computed as residuals, that is, as the actual values in column 1 less the computed values in columns 2 and 3.

⁷The Current Population Survey does not gather information on taxes paid. As a result, taxes are not directly reflected in our poverty measure. However, to the extent that changes in tax rates affect labor supply, their effects will show up in the market income data.

⁸Our estimates for each of the simulations begin with the actual 1983 values of each moment ($\ln Y_{1983}$). Each counterfactual uses successively more coefficients from the regressions shown in Table 4.

⁹It has proven particularly effective to set transfers and defense as competitors when, of course, there is no economic sense in which they actually compete. Defense absorbs real resources; transfers do not. When a target for the total government budget, rather than for purchases of goods and services is set, distributive and allocative expenditures are added together and set as a ratio to national allocative expenditures (GNP) alone. This is not good economics, but it apparently makes effective rhetoric.

APPENDIX

In the text we defined I^* as

$$I^* = \frac{I_1 + I_2}{T},$$

and assumed that it has a displaced lognormal distribution. Therefore,

$$Z = \frac{\ln(I^* + c) - \mu}{\sigma}$$

has a standardized normal distribution with density function $\phi(Z)$.

The three parameters of this distribution are μ , σ^2 , and c , the displacement factor (Aitchison and Brown, 1957). The first two parameters are the first two moments of the distribution of $\ln(I^* + c)$ since

$$\mu = E(\ln(I^* + c))$$

$$\sigma^2 = \text{var}(\ln(I^* + c)).$$

Since poverty has been defined as an income-to-needs ratio less than one, we can write

$$(1) \quad P = \int_{-\infty}^h \phi(z) dz, \quad \text{where } h = \frac{\ln(1.0 + c) - \mu}{\sigma}.$$

Poverty is, therefore, a function only of the parameters of the distribution of $\ln(I^* + c)$.

For ease of interpretation it is useful to use the following results, found in Metcalf (1972), which allow us to define the distribution in terms of c and the mean (α) and variance (β^2) of I^* , rather than the mean and variance of $\ln(I^* + c)$:

$$(2) \quad \mu = \ln\left[\frac{(\alpha + c)^2}{[\beta^2 + (\alpha + c)^2]^{1/2}}\right]$$

$$(3) \quad \sigma^2 = \ln\left[\frac{[\beta^2 + (\alpha + c)^2]}{(\alpha + c)^2}\right].$$

We can, therefore, decompose changes in poverty into three components:

$$dP = \frac{\partial P}{\partial \alpha} d\alpha + \frac{\partial P}{\partial \beta^2} d\beta^2 + \frac{\partial P}{\partial c} dc.$$

This decomposition can be expanded by recognizing that

$$\alpha = E(I^*) = E(I_1^*) + E(I_2^*)$$

and

$$\beta^2 = \text{var}(I^*) = \text{var}(I_1^*) + 2\text{cov}(I_1^*, I_2^*) + \text{var}(I_2^*),$$

where asterisks again indicate income as a proportion of needs.

Therefore,

$$(4) \quad dP = \frac{\partial P}{\partial \alpha} dE(I_1^*) + \frac{\partial P}{\partial \alpha} dE(I_2^*) + \frac{\partial P}{\partial \beta^2} d\text{var}(I_1^*) \\ + \frac{\partial P}{\partial \beta^2} d\text{cov}(I_1^*, I_2^*) + \frac{\partial P}{\partial \beta^2} d\text{var}(I_2^*) + \frac{\partial P}{\partial c} dc.$$

The derivatives of poverty with respect to α , β^2 , and c can be derived by recognizing that:

$$(5) \quad \frac{\partial P}{\partial \alpha} = \frac{\partial P}{\partial h} \left[\frac{\partial h}{\partial \mu} \frac{\partial \mu}{\partial \alpha} + \frac{\partial h}{\partial \sigma^2} \frac{\partial \sigma^2}{\partial \alpha} \right]$$

and

$$(6) \quad \frac{\partial P}{\partial \beta^2} = \frac{\partial P}{\partial h} \left[\frac{\partial h}{\partial \mu} \frac{\partial \mu}{\partial \beta^2} + \frac{\partial h}{\partial \sigma^2} \frac{\partial \sigma^2}{\partial \beta^2} \right].$$

Each component of equations (5) and (6) can be obtained from equations (1) to (3). Differentiating equation (1) yields

$$\frac{\partial P}{\partial h} = \phi(h)$$

$$\frac{\partial h}{\partial \mu} = -\frac{1}{\sigma}$$

$$\frac{\partial h}{\partial \sigma^2} = -\frac{h}{2\sigma^2}.$$

Differentiating equations (2) and (3) yields

$$\frac{\partial \mu}{\partial \alpha} = \frac{2\beta^2 + (\alpha + c)^2}{(\alpha + c)[\beta^2 + (\alpha + c)^2]}$$

$$\frac{\partial \sigma^2}{\partial \alpha} = -\frac{2\beta^2}{(\alpha + c)[\beta^2 + (\alpha + c)^2]}$$

$$\frac{\partial \mu}{\partial \beta^2} = -\frac{1}{2[\beta^2 + (\alpha + c)^2]}$$

$$\frac{\partial \sigma^2}{\partial \beta^2} = \frac{1}{\beta^2 + (\alpha + c)^2}.$$

Substituting these expressions into equations (5) and (6) yields

$$\frac{\partial P}{\partial \alpha} = \frac{\phi(h)}{\sigma^2(\alpha + c)(\beta^2 + (\alpha + c)^2)} [h\beta^2 - \sigma[2\beta^2 + (\alpha + c)^2]]$$

$$\frac{\partial P}{\partial \beta^2} = \frac{\phi(h)}{2\sigma^2[\beta^2 + (\alpha + c)^2]} [\sigma - h].$$

This shows how poverty changes with the mean and variance of the distribution of I^* .

The impact of changes in the displacement factor, c , on poverty can be obtained by recognizing that

$$\frac{\partial h}{\partial c} = \frac{1}{(1+c)\sigma} + \frac{\partial h}{\partial \alpha},$$

Therefore,

$$\frac{\partial P}{\partial c} = \frac{\phi(h)}{(1+c)\sigma} + \frac{\partial P}{\partial \alpha}.$$

The data shown in Table 1 are used to calculate estimates of α and β^2 . However, an additional piece of information is needed to estimate c . Metcalf (p. 21) uses the relationship between α and the 10 percent and 90 percent cutoffs to estimate c . We follow a similar method. Since we are primarily interested in the shape of the distribution near the poverty cutoff (where I^* equals one) we use a method which insures that the distribution based on $\hat{\alpha}$, $\hat{\beta}^2$, and \hat{c} , yields a cumulative density which is equal to the observed cumulative density at the cutoff.

Let h be the standardized normal variate, defined in equation (1), which is consistent with the observed poverty rate. Equations (1), (2), and (3) are, therefore, three nonlinear equations in three unknowns-- $\hat{\mu}$, $\hat{\sigma}$, and \hat{c} --which can be solved from three observed quantities-- \hat{h} , $\hat{\alpha}$, and $\hat{\beta}^2$. These equations are solved numerically in each year to yield estimates of c . A more complete discussion of this model appears in Gottschalk and Danziger (1985).

REFERENCES

- H. Aaron (1967), 'The Foundations of the "War on Poverty" Reexamined', American Economic Review, 57, 1229-1240.
- J. Aitchison and J.A.C. Brown (1957), The Lognormal Distribution, Cambridge University Press, New York.
- W.H. Locke Anderson (1964) 'Trickle-Down: The relationship between economic growth and the extent of poverty among American families', Quarterly Journal of Economics, 78, 511-524.
- A. Blinder and H. Esaki (1978), 'Macroeconomic activity and income distribution in the postwar United States', Review of Economics and Statistics, 60, 604-608.
- M. Boskin (1982), 'Reaganomics and income distribution: A longer-term perspective', Journal of Contemporary Studies, 5 (Summer), 17-30.
- G. Burtless (1983), 'Testimony before the U.S. House of Representatives, Committee on Ways and Means: Unemployment insurance and poverty', Washington, D.C., October 18.
- S. Danziger (1982), 'Poverty and inequality under Reaganomics', Journal of Contemporary Studies, 5, 17-30.
- S. Danziger, R. Haveman, and R. Plotnick (1981), 'How income transfer programs affect work, savings, and the income distribution', Journal of Economic Literature, 19, 975-1028.
- M. Dooley and P. Gottschalk (1984), 'Earnings inequality among males in the U.S.: Trends and the effect of labor force growth', Journal of Political Economy, 92, 59-89.
- L. E. Gallaway (1965), 'The foundations of the "War on Poverty"'. American Economic Review, 55, 123-131.

- L.E. Gallaway (1967), 'The foundations of the "War on Poverty:" Reply', American Economic Review, 57, 1241-1243.
- P. Gottschalk and S. Danziger (1984), 'Macroeconomic conditions, income transfers and the trend in poverty,' in D. Lee Bawden, ed., The Social Contract Revisited. Urban Institute Press, Washington, D.C.
- P. Gottschalk and S. Danziger (1985), 'A framework for evaluating the effects of economic growth and transfers on poverty," American Economic Review, 74 (March), in press.
- B. Kimzey (1983), Reaganomics, West Publishing, St. Paul, Minnesota.
- F. Levy and R. Michel (1983), 'The way we'll be in 1984: Recent changes in the level and distribution of disposable income', Urban Institute Discussion Paper, Washington, D.C., November.
- C. Metcalf (1972), An Econometric Model of Income Distribution, Rand McNally, Chicago.
- J. Palmer and I. Sawhill, eds. (1984), The Reagan Record, Ballinger, Cambridge, Mass.
- I. Sawhill and C. Stone (1985), 'Economic policy', to appear in a forthcoming Urban Institute Press volume on the Reagan experiment.
- J.R. Thornton, R.J. Agnello, and C.R. Link (1978), 'Poverty and economic growth: Trickle down peters out', Economic Inquiry, 16, 385-393.
- U.S. House of Representatives, Subcommittee on Oversight and Subcommittee on Public Assistance and Unemployment Compensation of the House Ways and Means Committee (1984), 'Families in poverty: Changes in the safety net', 98th Congress, 2nd session, Committee Print #98-37, Government Printing Office, Washington, D.C.

Comment on "The Effects of Unemployment and
Policy Changes on America's Poor"*

Daniel H. Weinberg

*I would like to thank Lyle Nelson and Reuben Snipper for their helpful comments. The views expressed in this comment are those of the author and should not be construed as representing the official position or policy of the Department of Health and Human Services or any office therein.

Comment on "The Effects of Unemployment and
Policy Changes on America's Poor"

The authors have prepared a provocative paper whose conclusions are controversial because they speak directly to the effects of recent U.S. tax and transfer policy on poverty. My comments are of three kinds: enthusiasm about the concept, reservation about the methodology, and disagreement about the results. I should say at the outset that my comments have been reduced in length and scope by the generous response of the authors to my original criticisms and objections.

I am pleased that researchers are finally dissecting the income distribution into its component pieces. Danziger, Gottschalk, and Smolensky break new ground by examining the moments of two components of the distribution--market income and transfer income. To understand income distribution or income redistribution in the United States (or any other country), one needs perspective on how the government affects the income distribution. (Parenthetically, it would have been nice to look at the effect of noncash income, both transfers and fringe benefits, but data problems are severe in doing any time-series analysis of noncash transfers.) This laudable overall perspective is unfortunately not the thrust of the paper.

The authors have focused the conference-topic of "income transfer policies and the economic well-being of the poor" on the narrow issue of obtaining an estimate of the effect of President Reagan's program on U.S. poverty. I confess I'm a bit disappointed in that. While the question is important, the approach to looking at the effect of income transfers

on the income distribution could have been more broadly applied to examine both the redistributive aspects of the income transfer system as a whole over the 1967-83 period and the effects of the recent changes. That's enough criticism of what they've not done; on to what they have done.

SUMMARY OF THE PAPER

First, a brief summary of the paper. The authors parameterize the poverty rate as a function of the distribution of family income to needs, as measured by the official U.S. poverty thresholds. They then assume a particular distribution for this ratio (displaced lognormal) and derive the "partial derivatives of poverty"; i.e., a decomposition of changes in poverty associated with changes in the means and variances of each income source (market and transfer income), their covariance, and the displacement factor of the distribution. Their Table 1 presents the time series of the means and variances of these two income ratios for the last sixteen years. The data themselves are fascinating. Mean market incomes fluctuate in a fairly narrow range--from 2.5 to 3.0 times the poverty level--going up from 1967 to 1973, down from 1973 to 1975, up again from 1975 to 1978, and steadily down since then.

Note that this is not the same fluctuation as the business cycle. I would have liked the authors to speculate on the seeming lack of strong correlation between the business cycle and changes in these ratios. The mean transfer-income-to-needs ratio shows nowhere near the movement that the market-income ratio does. The latter rises from .15 in 1967 to .31 in 1975 and then stays at this level (rising slightly to .33 in 1983).

Part of the authors' story will turn on this pattern--focusing in particular on why this ratio does not rise more significantly in the severest postwar U.S. recession (that of 1981-83). The authors conclude from these data that there has been an increase in income inequality in the United States since 1967.

They then use these data to estimate a regression model of the six parameters that describe the income distribution in their model. The most important assumption of this regression model is the characterization of the Reagan program as a single dummy variable (more on this later). They find that the Reagan program "increases the mean and variance of market income," but only the latter significantly, and has decreased significantly the mean and variance of transfer income. They then go on to simulate the six parameters and the implied poverty rates for several 'counterfactuals', decomposing the 2.2 percentage point increase in poverty between 1980 and 1983 into the following components:

- Poverty change due to changing unemployment rate: +0.7 points
- Poverty change due to Reagan shift in mean and variance of transfers: +0.9 points
- Poverty change due to Reagan shift in other four moments: +0.3 points
- Poverty change due to change in productivity: -0.1 points
- Residual: +0.4 points

Their major conclusion is therefore that more than half (0.12/0.22) of the recent increase in U.S. poverty was due to the Reagan tax and budget program, but that the change in poverty due to changing unemployment is difficult to assign owing to changing fiscal and monetary policies that both affected macroeconomic conditions.

CRITICISMS

Let me now talk about my major problems with the paper.

Determining the income distribution

My first problem is that Danziger et al. go to a lot of trouble to estimate distributions of income to needs and then talk only about poverty and the Reagan program. I think there's more there. I'd like the authors to spend a bit more time teasing out the implications of their findings for the entire income distribution, not just for the poor.

Next, I feel it is incumbent on me to point out that their entire paper is built on one assumption--that the ratio of income to needs is distributed as a displaced lognormal in the population. They have chosen this distribution because they say it is not restrictive in form and makes empirical work tractable. I say it is somewhat restrictive in form and the fact that it is empirically tractable is not the issue. The overriding consideration should be how well it fits the data. Just because lognormal distributions have worked well in income distribution studies in the past does not mean they would work well in a study of income-to-needs ratios, much less for the joint distribution of both market income and transfer income as implied by their equation (1). Figures 1 and 2 present plots of these ratios in the population for two representative years, 1977 and 1982 (data are drawn from the same surveys the authors used--the Current Population Surveys). Because a substantial number of families fall in the 0.0-0.2 ratio category (11 and 12 million for market income, and 53 and 58 million for transfer income, for 1977

FIGURE 1

RATIO OF INCOME TO POVERTY LEVEL, 1977

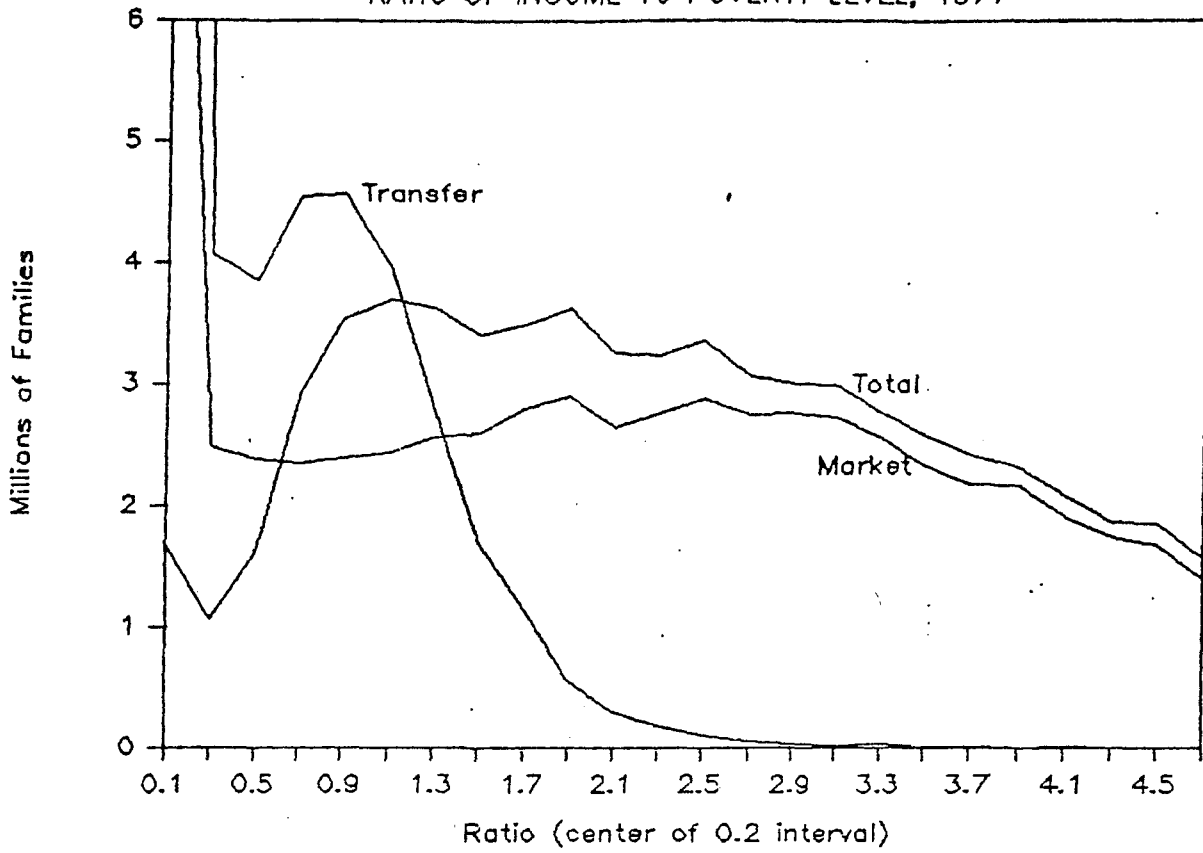
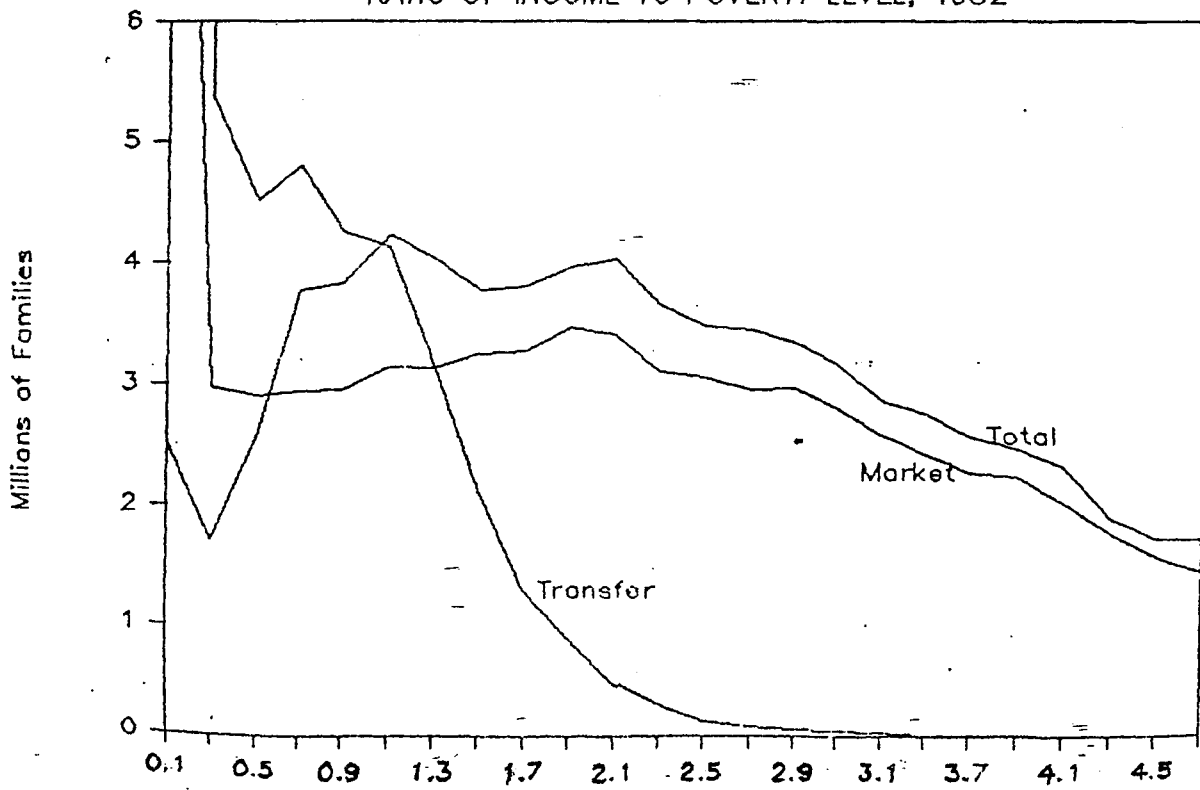


FIGURE 2

RATIO OF INCOME TO POVERTY LEVEL, 1982



and 1982 respectively), it is not possible to model the separate distributions of the ratios of market income or transfer income to needs as displaced lognormals. It does, however, appear that the total income ratio could be modeled that way. (The derivation of the poverty rate as presented in their appendix does not appear to require that the market or transfer income ratios need to be distributed lognormally, though I would like some clarification on that point.)

A further problem with modeling the distribution crops up. What about underreporting and nonreporting of income? If income misreporting is not randomly distributed among the population, then it is likely that the distributional parameters estimated by Danziger et al. are biased. Moreover, we would have further problems if the extent of misreporting changed over the period owing to, say, changes in questionnaire design (there were major changes in the CPS questionnaire in 1980). In sum, the authors need to look at other statistical distributions to test the sensitivity of their conclusions to their particular distributional assumption.

Specification and estimation

I have problems with both the specification of their regression equations and the estimation procedure used to derive the coefficients. My first point, and perhaps the most important one in light of the paper's focus, is with their representation of the Reagan program. To refresh your memory, they use a single dummy variable, taking the value of 0.25 in 1981, 1.0 in 1982, and 1.0 in 1983 to represent a major restructuring of both tax and spending programs. They do admit that the

dummy variable approach 'attributes all noncyclical and nonsecular changes to Reagan' and that there may have been other forces beyond Reagan's control which may also have affected the moments of the distribution. Since they have no way of separating these other factors from the direct impact of programmatic changes, it is difficult to believe that it captures any special effect of the Reagan program as distinct from the more general "period" effect.

Accepting for the moment that a dummy variable is the right way to model the Reagan program, is the dummy specified correctly? Not necessarily. The Reagan program was implemented by a number of laws, including the Omnibus Budget Reconciliation Act and the Economic Recovery Tax Act (both signed in August 1981), the Tax Equity and Fiscal Responsibility Act (signed September 1982), and the Social Security Amendments of 1983 (signed April 1983).

Even if the provisions of these bills were implemented immediately, the correct specification is not immediately apparent. Moreover, the program changes were not implemented immediately. To use one example, the individual income tax changes were to be implemented over a five-year period. Further, there were substantial additional influences on macroeconomic conditions at that time--why not have a "Volcker" dummy to represent the tight monetary policy that had been in effect for the United States from 1979 through 1982? It is a matter of some controversy as to how much control President Reagan had over monetary policy in this period. Why not try a "Carter" dummy to represent the 1976-80 period, to remove other influences? The list could go on, limited only by the degrees of freedom. The sensitivity of their results to the specification of the dummy variable is a very serious limitation of their paper,

which in fairness they do realize and demonstrate conclusively in Table 4.

Finally, it is clear to me that the distribution of income to needs ratios is different for different demographic groups. For example, the distribution for families headed by prime-aged males is likely to be quite different from that for the elderly or for female-headed families. Similarly, the distribution for families with children is likely to be quite different from that for families without children. While this point is not a criticism of the technique employed, it seems important to pursue demographic differences as a way to understand poverty, which, after all, is the point of the paper.

To be sure, even if they had had the correct specification, there are potential problems with their estimation procedure as well. It was appropriate to account for serial correlation in the time-series data and the results show substantial autocorrelation for three of the six moments. I am, however, disturbed by the attempt to estimate thirty reduced-form coefficients with only seventeen years of data. It seems at least possible that there is some correlation between the six dependent variables that makes simultaneous estimation of the equations appropriate. They should at least do a test of the presence of simultaneity by looking at the simple correlations of the error terms and possibly a linear regression of each estimated error on the other five estimated errors.

Prediction

Danziger et al. state that these coefficients can be used to simulate the six parameters of the distribution and the poverty rates for several

counterfactuals. This requires a certain amount of confidence both in the specification of the reduced-form equations (to predict the parameters of the distribution) and in the choice of the distribution (to predict the poverty rate).

As I have stated earlier, both of these assumptions are shaky. Be that as it may, my major criticism of the decomposition of the change in poverty that they present is the reliance on a small number of mostly insignificant coefficients to draw a conclusion that could have major policy implications. At the very least, the authors should take into account the standard errors of their estimates and present confidence intervals.

CONCLUSION

In conclusion, I must echo the misgivings of my opening paragraph. The paper has a good premise and presents some useful information, but there are substantial problems with the assumptions, model specification, and policy simulations. The paper can be improved. The authors should do some sensitivity analysis of their distributional assumptions, test some alternate specifications and model estimation procedures, and deemphasize the policy conclusion.

I would to see the authors repeat this analysis in five years, when we have the data to test the full impact of the Reagan years.