E C O N O M I C S B U L L E T I N

Has the 1996 Welfare Reform Reduced the U.S. Poverty Rate? An Empirical Analysis Using Panel Data

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Abstract

This paper empirically analyzes the effects of welfare reform on US poverty by applying a two-stage estimation procedure with the random effects model using panel data from 1991 through 2003. Our results suggest that a rise in TANF or in unemployment rate raises poverty, whereas the welfare reform started in 1996 has not contributed significantly to poverty reduction.

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I. Introduction

We examine antipoverty effects of the welfare legislation of 1996. Poverty reduction is a commonly recognized social goal around the world. In the US, the poverty rate has remained above 12 percent for more than a decade (US Census) with the lowest rate of 11.3 percent observed in 2000. 37 million, or about 1 out of 8, Americans live in poverty. With the ebb and flow of the poverty-related concerns at the U.S. policy circles, the last major act of legislation resulted in the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, later known as the welfare reform. The stated goal of the reform was to establish a welfare system that would promote "responsibility, work ethic, self-sufficiency, and family values."

By imposing strict work requirements, PRWORA ended the six decades long Aid to Families with Dependent Children (AFDC) that had not required the aid recipients to work for pay. The new legislation replaced it with Temporary Assistance for Needy Families (TANF). Not surprisingly, TANF caseloads have subsequently dropped by more than 50 percent, i.e. by 7.3 million at the national level between August 1996 and June 2003. Low unemployment rates and increased labor force participation are believed to be two of the key macroeconomic factors responsible for this apparent improvement.

A sound macro performance of the economy can push the wage rate up and draw more workers into the labor pool (Gundersen and Ziliak 2004, Kang et al. 2004). Yet, the entry of poor low-skill workers in the labor market does not guarantee an increase in their real income as higher wages might reduce welfare benefits and neutralize earned income increases (Blank 2002). Though PRWORA does not directly target poverty reduction since the new welfare is a program of temporary assistance, a policy that seeks to encourage work is expected to have relatively strong implications for poverty alleviation.

We find, however, that despite significant reduction in the TANF caseloads the welfare reform implemented in 1996 has not reduced poverty significantly in the U.S. We apply a two-stage estimation procedure with the fixed- and random-effects model using panel data from 1991 through 2003. Our results do suggest that a decrease in TANF or in unemployment rate leads to a lower poverty level, but that the welfare reform started in 1996 has failed to contribute significantly to poverty reduction.

II. Prior Work

Kilty (2006) strongly argues that there has been no connection between the smaller TANF and poverty, and that instead of reducing poverty TANF has only succeeded in making it *invisible.* Several studies have looked into the causes of a significant drop in the TANF caseloads by exploring the relationship among income, wellbeing and poverty from various perspectives.

Focusing on low-income women and children, Schoeni and Blank (2000) and Grogger (2002) assert that TANF has significantly reduced the incidence of poverty among less skilled women. On the other hand, Meyer and Sullivan (2001) analyze total consumption among low income women and assert modestly that welfare reform has not resulted in a decrease in women's wellbeing. Using longitudinal data to assess the impact on specific categories of households, Connolly and Marston (2004) find that welfare reform improves economic outcomes for high school graduates but not for the non-graduating families.

In a comprehensive review, Blank (2002) cautions against equating the effects of welfare reform with poverty reduction, in the absence of appropriate measures of economic well-being. She also argues for the importance of exploring the long-term impact of the overall US economic performance on welfare recipients, as it is only in the context of economic cycles that we can

distinguish between economic and welfare policy effects.

Following Blank's suggestion, we recognize different types of effects of the welfare policy but choose just one aspect of the effects for our empirical investigation. Our question is, after controlling for other determinants of poverty, can we say whether the implementation of PRWORA has reduced poverty in the US? We use panel data from 1991 to 2003 for 48 contiguous states. Specifically, we analyze the relationship between population living in poverty and TANF/AFDC recipients while controlling for unemployment, education, the onset of welfare reform, and selected geographic factors. Estimation results suggest that the welfare reform has not significantly reduced poverty in the U.S.

III. Data and Modeling Methods

We construct our dataset from the following sources. Poverty related data and the percentage of families living below 100 percent of the poverty line (POVR) are from the Current Population Survey of the Census Bureau. Unemployment rate (UNEMPR) comes from the Bureau of Labor Statistics. The source of education-related data—public high school dropout rates (DROPOUT) — is the Department of Education. Welfare related data such as TANF recipients (TANFR), welfare administration costs (LADMIN), and total TANF benefits (LBENEFIT) come from the Health and Human Services Department. Overall, our sample consists of 464 observations representing a panel of 48 states and for any state a maximum of 13 years of data from 1991 to 2003.

To measure the effect of welfare reform, we use a reform dummy (REFORM) for the implementation of PRWORA in 1997. The reform sought to encourage self-sufficiency through work. But by putting a cap on the duration of welfare benefits, it also increased the cost of dropping out of school. Thus one would expect the policy change to have had a ripple effect on the rate of unemployment and the level of education as well. To allow for these additional effects, we introduce interactive terms (UNEMPR97, DROPOUT97) between the reform regime on the one hand and unemployment and schooling on the other. In addition, to capture any changes in the geographic disposition of poverty, we also include regional dummy variables WEST, SOUTH and MIDWEST, by taking the Northeast as the control region. Descriptive statistics of our variables appear in Table 1.

The PRWORA made the states determine the eligibility and the size of benefits under TANF. While these objective criteria are different for different states, each state must identify a sufficiently low financial status for TANF eligibility. The Federal poverty guideline ($20,650 of income for a family of 4 persons at the 100% poverty guideline in 2007, for instance) is used by states for some of their programs such as children's health insurance, but the guideline is not directly used in cash assistance programs such as TANF (IRP, 2007).

TANF recipients also face time limits on benefits and have work requirements. For example, an increased labor supply could affect real income status of TANF recipients and result in a lower poverty rate. Thus an element of endogeneity sets into the percentage of TANF recipients. But searching for suitable instruments that could resolve the problem of endogenous TANFR has proved most challenging. We note that the benefits under TANF/AFDC are the paid cash benefits and expenses incurred to administer the program are resolved at the state and federal levels from past fiscal year's records; and they are largely exogenously determined. Hence, we use these expenses with one-year lag of time as instruments for the TANFR variable.

Data on benefits and administrative expenses show large skewness and heavy tails at their level form. For example, the benefit received has a mean value about three times as large as

the median displaying a large positive skewness and many observations on the tails. A simple log transformation of these variables makes their distribution close to normal. Our first step regression results are based on data for these transformed variables: LBENEFIT and LADMIN.

The regression function appears in equation (1). To let error term better represent normal distribution, we apply least squares method to logarithmic function for year *t* and state *i*:

$$POVR_{it} = \beta_0 + TANFR_{it}'\beta_1 + x_{it}'\beta_S + z_{it}'\beta_2 + REFORM_{it} \times x_{it}'\times\beta_3 + REFORM_{it}'\beta_{97} + u_i + \varepsilon_{it} \quad (1)$$

where x is the vector of explanatory variables of unemployment rate (UNEMPR) and high school dropouts (DROPOUT). Vector z measures regional distribution (WEST, MIDWEST, and SOUTH). REFORM is the dummy variable that separates the implementation of welfare policy, PRWORA, starting 1997, from the earlier period. As discussed before, PRWORA might have affected other socio-economic outcomes, particularly unemployment and schooling. Hence, we include terms involving interaction of welfare with UNEMPR and DROPOUT to capture such effects. βs are the coefficient vectors. We estimate both the fixed- and random-effects models but report the results for the latter because of its superiority on econometric grounds. The term u_i is the group effect with variance σ_u^2, and zero cross-group effect, and the residual ε follows the classical distribution with mean 0 and variance σ_ε^2.

To make statistical inferences about the relationship between TANF recipients and people in poverty and to test the impact of PRWORA, we put forward the following hypotheses against the null of no effect:

H1: TANF/AFDC recipients have a positive effect on poverty rate, i.e., $\beta_{TANFR} > 0$.
We expect to reject the null hypothesis since a decline in the rate of TANF/AFDC recipients implies a decrease in poverty.

H2: PRWORA has a significant impact on the poverty rate, i.e., $\beta_{REFORM} \neq 0$.
The policy implication of H2, if verified, is that the implementation of welfare reform helps reduce poverty. We do not hypothesize a specific sign for β_{REFORM} *a priori* since the literature indicates ambiguous results.

IV. Empirical results

Four sets of parameters are estimated from model (1), with and without the interaction of the REFORM dummy variable. The first two models do not take into account the possible endogeneity of the TANFR variable, while the last two models, labeled (IV), instrument for the possible endogeneity in TANFR using a two-stage regression. In the first stage, the exogenous variables include all the explanatory variables in Table 2 and two additional instruments, namely, benefit payments and administrative expenses with a one-year lag. The overall goodness-of-fit is shown by an F-value of 24, which removes the concerns about the weakness of the instruments (Staiger and Stock 1997). The results on the first stage estimation are reported in the appendix.

All the results shown in Table 2 are based on the random-effects estimation. The choice of the random- over fixed-effects model is based upon the results of the Hausman test which favors the random-effects model.

Our findings are largely consistent across four models. The results suggest a significantly positive relationship between TANF recipients and poverty rate. A decrease of 1 percent in TANF recipients leads to a decline in the poverty rate of 0.37 to 0.51 percent. This positive relationship between TANF and poverty is robust across the methods of estimation, i.e., with or without the use of instrumental variables. We therefore accept H1, that $\beta_{TANFR} > 0$.

Another interesting finding is about the impact of the welfare reform. Across all models,

the coefficient of REFORM is negative but statistically insignificant. Thus the results reject H2 as we do not find strong evidence that, during the period 1997-2003, the implementation of PRWORA has contributed to poverty reduction.

Turning to other explanatory variables in the model, a higher unemployment rate results in higher poverty, and in general, southern states have higher poverty rates. Compared to the northeast, the south has a median poverty rate about 3.2 percentage points higher. Finally, accounting for endogeneity is not found to change these results.

V. Conclusion

Our study investigates the relationship between US poverty and the implementation of PRWORA. Based on our results from the random effects two-stage estimation, the higher rates of unemployment and TANF recipients lead to higher poverty, whereas the ongoing welfare reform post-1996 has not made a significant impact on the US poverty rate.

We close our discussion with a note on further research. In this paper, we have taken poverty rate for the *total* population in each state as our dependent variable. But welfare reform might have had a greater impact on sub-population groups such as those with a female head of household, or on children. As Haskins (2001) and Zedlewski et al. (2002) note, the poorest quintile of families headed by single mothers had gained a small ground in the first half of the 1990s but suffered an absolute decline in income in the second. While limited data availability made a rigorous econometric analysis of the effect on such groups impossible in the current study, we will explore how the welfare policy has affected sub-population groups, e.g., women and children, in a future research.

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Table 1: Descriptive Statistics [N=464]

Variables	Descriptions	Mean	Std. Dev	Min.	Max
POVR[1]	Poverty rate (%), calculated as the ratio of the number of people living in poverty to population, by state	12.39	3.90	5.20	26.40
TANFR[2]	TANF recipient rate (%), calculated as the ratio of total TANF recipients to population, by state	2.82	1.85	0.15	12.21
UNEMPR[1, 3]	Unemployment rate	5.03	1.40	2.26	10.44
DROPOUT[4]	Public high school dropouts by state	4.92	1.99	1.80	13.70
WEST	Regional dummy variable, =1 if the state is located in the west; else 0	0.18	0.38	0	1
SOUTH	Regional dummy variable, =1 if the state is located in the south; else 0	0.23	0.42	0	1
MIDWEST	Regional dummy variable, =1 if the state is located in the midwest; else 0	0.24	0.43	0	1
PRWORA	Dummy variable for the implementation of PRWORA 1996, equals 1 for 1997 and after; and 0 for prior years	0.56	0.50	0	1
LADMIN[2]	Administrative costs by states ($millions), in logarithm, 1 year lag	2.06	1.37	-4.39	5.79
LBENEFIT[2]	Total TANF benefits by states, in logarithm, 1 year lag.	4.67	1.19	0.69	7.95

Sources of Data:

1. US Census Bureau.
2. US Department of Health and Human Services, Administration for Children and Families, Office of Program Support, Office of Management Services.
3. US Department of Labor, Bureau of Labor Statistics.
4. US Department of Education, National Center for Education Statistics, Common Core of Data.

Table 2: Estimation results on poverty: panel data, 1991-2003

Variables	Random Effects, Panel without endogeneity correction	Random Effects, Panel without endogeneity correction	Random Effects, Panel with endogeneity correction (IV)	Random Effects, Panel with endogeneity correction (IV)
Intercept	8.280***	8.274***	8.347***	8.351***
	(0.961)	(0.976)	(1.153)	(1.110)
TANFR	0.374***	0.384***	0.473*	0.506*
	(0.091)	(0.097)	(0.245)	(0.281)
UNEMPR	0.463***	0.444***	0.424***	0.377**
	(0.095)	(0.116)	(0.125)	(0.193)
UNEMPR97	--	0.372	--	0.077
		(0.136)		(0.193)
DROPOUT	0.103	0.116	0.065	0.085
	(0.081)	(0.086)	(0.089)	(0.090)
DROPOUT97	--	-0.031	--	-0.053
		(0.089)		(0.093)
WEST	-0.674	-0.675	-0.615	-0.599
	(0.957)	(0.950)	(1.213)	(1.188)
SOUTH	3.139***	3.144***	3.149***	3.173***
	(0.921)	(0.914)	(1.158)	(1.140)
MIDWEST	-0.732	-0.741	-0.789	-0.802
	(0.928)	(0.921)	(1.144)	(1.122)
REFORM	-0.442	-0.450	-0.349	-0.419
	(0.25)	(0.675)	(0.416)	(0.692)
σ-raneff	2.314	2.291	2.992	2.942
σ-var	1.577	1.580	1.609	1.621
χ^2	207.58	207.44	198.22	F: 19.61
R^2	0.44	0.44	0.42	0.43

Notes:
1. Numbers in parenthesis are standard errors, adjusted by heteroscedacity-robust covariance.
2. *, **, *** indicate significance at 0.10, 0.05 and 0.01 levels, respectively.

Appendix: First-stage estimates for instrumental variables regression

Variables	Random Effects, Panel with endogeneity correction
Intercept	-2.613***
	(0.741)
UNEMPR	0.424***
	(0.046)
DROPOUT	0.116
	(0.040)
WEST	-0.869
	(0.564)
SOUTH	-0.800
	(0.541)
MIDWEST	-0.213
	(0.544)
PRWORA	-0.974
	(0.113)
$LADMIN_{t-1}$	-0.158***
	(0.006)
$LBENEFIT_{t-1}$	0.826***
	(0.097)
N	451
CHISQ	800