



Does welfare reduce poverty?

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ABSTRACT

The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 made fundamental changes in the federal system of public assistance in the United States, and specifically limited the eligibility of immigrant households to receive many types of aid. Many states chose to protect their immigrant populations from the presumed adverse effects of welfare reform by offering state-funded assistance to these groups. I exploit these changes in eligibility rules to examine the link between welfare and poverty rates in the immigrant population. My empirical analysis documents that the welfare cutbacks did not increase poverty rates. The immigrant families most affected by welfare reform responded by substantially increasing their labor supply, thereby raising their family income and slightly lowering their poverty rate. In the targeted immigrant population, therefore, welfare does not reduce poverty; it may actually increase it.

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1. Introduction

The rapid growth of the welfare state spawned a large literature examining the factors that determine whether families participate in public assistance programs, and investigating the programs' impact on various social and economic outcomes, such as labor supply, household income, and family structure.¹ Remarkably, little attention has been paid to the impact of welfare programs on a summary measure of the family's well being: the family's poverty status. Presumably, an important goal of the various programs in the welfare state is to reduce the poverty rate among disadvantaged households. Nevertheless, after a half century of experimentation with welfare programs and after thousands of empirical studies that examine many aspects of these programs, the answer to this question remains elusive.

The link between welfare and poverty is difficult to measure because a built-in spurious correlation precludes researchers from drawing credible inferences: the families that are most likely to be poor are also the families that are most likely to qualify for and participate in welfare programs. The impact of welfare on poverty could be identified through a randomized experiment wherein the government provides aid to some families and denies aid to a control group. Although such an idealized experiment does not exist, the huge changes in eligibility introduced by the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) provide a great deal of exogenous variation that could, in principle, help address this important question.²

¹ Moffitt (1992) gives a comprehensive review of the literature.

² A number of experiments vary some of the parameters in welfare programs to examine how these marginal changes affect poverty rates. These experimental studies suggest that welfare reforms reduce poverty when the reforms have a strong financial work incentive; see Bos et al. (1999) and Miller et al. (2000). Schoeni and Blank (2000) and Bitler et al. (2002) provide some econometric evidence that is consistent with these experimental findings.

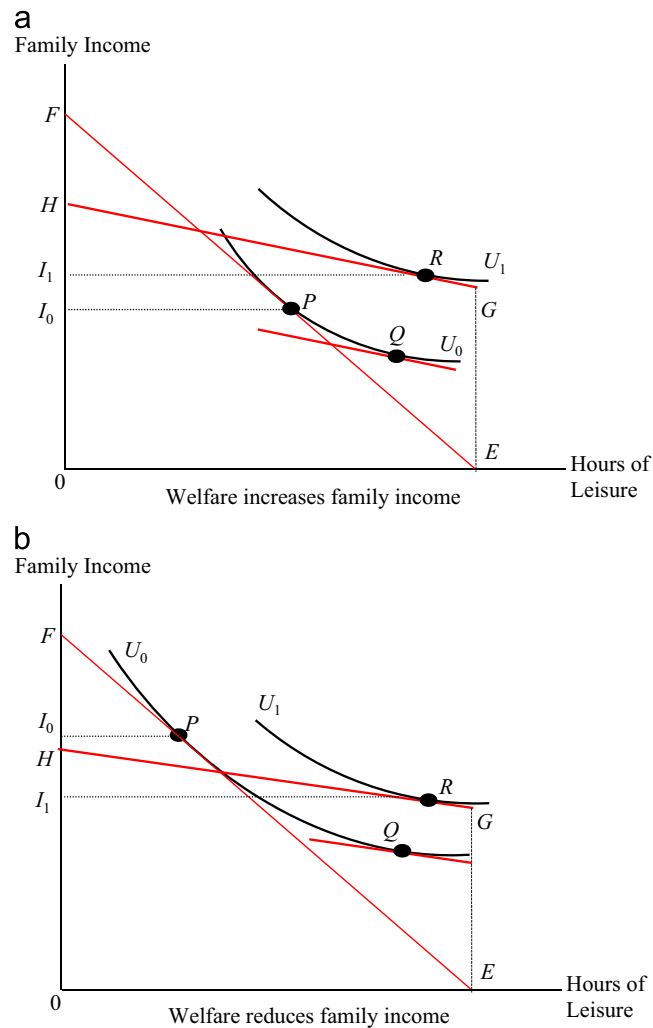


Fig. 1. Welfare, labor supply, and family income. (a) Welfare increases family income. (b) Welfare reduces family income.

Although PRWORA changed eligibility rules for almost all households, some key changes were specifically targeted at immigrants. It is well known that immigrant participation in welfare programs rose rapidly in recent decades (Borjas and Hilton, 1996). This steep rise in immigrant welfare use motivated Congress to include a number of eligibility restrictions in the 1996 legislation. It turns out, however, that these restrictions could potentially affect only a subset of the immigrant population, depending on the family's state of residence, on whether the family entered the country as refugees, and on whether the foreign-born person was naturalized or not. As a result, the idiosyncratic changes in immigrant eligibility present a unique opportunity to examine the link between welfare and poverty.

The number of immigrants entering the United States grew rapidly in recent decades. During the 1950s, only 250,000 legal immigrants entered the country annually. By the 1990s, nearly 1 million persons entered the country legally each year and another 300,000 entered and stayed in the country illegally.³ An increasing number of the new immigrants fall in the lower rungs of the skill and income distributions.⁴ As a result of these trends, there has been an increasing "foreignization" of poverty. In 1979, 9.7 percent of the poor lived in immigrant households (Camarota, 1999). By 1997, 21.6 percent of the poor lived in immigrant households.

(footnote continued)

although Bitler, Gelbach, and Hoynes find that welfare leads to reductions in poverty in some specifications and to increases in poverty in others; see also Moffitt (1999) and Grogger (forthcoming). Grogger et al. (2002, Chapter 8) summarize the evidence.

³ U.S. Immigration and Naturalization Service, 2000, pp. 18, 271.

⁴ Borjas (1999, p. 21) reports that the typical immigrant worker in 1960 earned 4 percent more than the average native worker. By 1998, the typical immigrant earned 23 percent less.

Table 1

Trends in Welfare Participation and Poverty Rates, 1994–2000. Source: All statistics are calculated from the 1995–2001 March Current Population Surveys.

Variable:	Calendar year						
	1994	1995	1996	1997	1998	1999	2000
<i>Percent receiving cash benefits or food stamps:</i>							
Natives	11.2	10.6	10.4	9.2	8.2	7.9	7.3
Immigrants	15.2	14.4	13.0	11.9	10.6	9.7	8.9
Citizens	9.1	9.8	9.7	9.8	9.4	9.1	9.8
Non-citizens	18.5	17.1	15.1	13.5	11.4	10.1	8.3
<i>Percent receiving cash benefits, food stamps, or Medicaid:</i>							
Natives	14.6	14.0	14.2	12.8	12.0	11.8	11.9
Immigrants	20.0	19.7	18.3	16.8	16.1	15.9	16.8
Citizens	13.3	13.9	14.2	14.2	14.3	13.9	16.6
Non-citizens	23.7	23.2	21.1	18.6	17.4	17.3	16.9
<i>Poverty rate:</i>							
Natives	14.6	13.7	13.8	13.5	13.0	12.4	11.9
Immigrants	23.7	24.2	23.0	22.5	21.4	18.9	17.8
Citizens	12.0	12.8	12.7	14.7	14.3	11.3	11.8
Non-citizens	30.1	30.9	30.0	28.2	26.3	24.4	22.3
<i>Adjusted poverty rate:</i>							
Natives	12.9	12.1	12.3	12.1	11.8	11.3	11.1
Immigrants	22.0	23.3	22.1	22.0	21.1	18.4	17.3
Citizens	11.0	12.1	11.9	14.2	14.0	10.9	10.8
Non-citizens	28.1	29.9	29.0	27.7	26.0	23.9	22.0

This paper uses data drawn from the 1995–2001 Current Population Surveys to examine the impact of PRWORA on the poverty rate and family income of immigrant families. It turns out that the immigrants most adversely affected by welfare reform responded by significantly increasing their labor supply. In fact, the increase in labor earnings was large enough to more than offset the impact of the welfare cutbacks. The study, therefore, provides a surprising answer to the question posed in the title to this paper. Welfare does not reduce poverty; it may actually increase it.

2. Welfare and poverty: framework and data

The Census Bureau determines the poverty status of a family by comparing the family's pre-tax *cash* income with a poverty threshold that depends on family size and composition.⁵ All types of cash receipts, including public assistance, are included in the calculation of family income. Families (and all persons in those families) with cash incomes below the poverty threshold are considered poor.

A simple application of the neoclassical model of labor-leisure choice indicates that there is an ambiguous link between welfare and poverty. The two panels of Fig. 1 illustrate the predicted impact of a generic welfare program on family income (and hence the poverty rate). In each panel, the family initially faces budget line *FE* in the labor market, and chooses the consumption basket at point *P*. The welfare program generates a new opportunity set, bounded by the budget line *HG*. This budget line is flatter than the one available in the labor market because welfare benefits typically drop off substantially as the family accumulates more labor earnings. As drawn, the representative family chooses to enroll in the welfare program and shifts to the consumption basket at point *R*.

The move from *P* to *R* can be decomposed into an income effect (*P* to *Q*) and a substitution effect (*Q* to *R*). Both the income and substitution effects imply that the welfare program induces a reduction in family labor supply (assuming leisure is a normal good). Note, however, that this behavioral response has an ambiguous effect on family income: The substitution effect reduces family income, while the income effect increases it. As a result, family income rises from *I*₀ to *I*₁ in the top panel of the figure, but falls in the bottom panel. Inspection of Fig. 1 suggests that family income is more likely to decline when the compensated labor supply response to the implicit taxation of labor earnings is very elastic. Put differently, welfare programs may actually increase measured poverty rates if the substitution effect is relatively large.

⁵ The poverty threshold does not vary across regions, but it is adjusted annually for inflation. As an example, the poverty threshold in 2001 for a four-person household with two related children was \$17,960. Fisher (1992) provides a detailed discussion of the construction and history of the poverty threshold.

Table 2

State-funded assistance to immigrants after 1996. Source: Zimmermann and Tumlin (1999), Table 5. The state-funded programs for post-enactment immigrants are offered during the (federal) five-year bar following the time of entry into the United States.

State	Pre-enactment immigrants				Post-enactment immigrants			
	TANF	Medicaid	Food assistance	SSI	TANF	Medicaid	Food assistance	SSI
Alabama	No	Yes	No	No	No	No	No	No
Alaska	Yes	Yes	No	No	No	No	No	No
Arizona	Yes	Yes	No	No	No	No	No	No
Arkansas	Yes	Yes	No	No	No	No	No	No
California	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colorado	Yes	Yes	No	No	No	No	Yes	No
Connecticut	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Delaware	Yes	Yes	No	No	No	Yes	No	No
District of Columbia	Yes	Yes	No	No	No	No	No	No
Florida	Yes	Yes	Yes	No	No	No	No	No
Georgia	Yes	Yes	No	No	Yes	No	No	No
Hawaii	Yes	Yes	No	No	Yes	Yes	No	No
Idaho	Yes	Yes	No	No	No	No	No	No
Illinois	Yes	Yes	Yes	Yes	No	Yes	No	No
Indiana	Yes	Yes	No	No	No	No	No	No
Iowa	Yes	Yes	No	No	No	No	No	No
Kansas	Yes	Yes	No	No	No	No	No	No
Kentucky	Yes	Yes	No	No	No	No	No	No
Louisiana	Yes	Yes	No	No	No	No	No	No
Maine	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maryland	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Massachusetts	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Michigan	Yes	Yes	No	No	No	No	No	No
Minnesota	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Mississippi	Yes	Yes	No	No	No	No	No	No
Missouri	Yes	Yes	Yes	No	Yes	No	No	No
Montana	Yes	Yes	No	No	No	No	No	No
Nebraska	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Nevada	Yes	Yes	No	No	No	No	No	No
New Hampshire	Yes	Yes	No	Yes	No	No	No	No
New Jersey	Yes	Yes	Yes	No	No	No	No	No
New Mexico	Yes	Yes	No	No	No	No	No	No
New York	Yes	Yes	Yes	No	No	No	No	No
North Carolina	Yes	Yes	No	No	No	No	No	No
North Dakota	Yes	Yes	No	No	No	No	No	No
Ohio	Yes	Yes	Yes	No	No	No	No	No
Oklahoma	Yes	Yes	No	No	No	No	No	No
Oregon	Yes	Yes	No	Yes	Yes	No	No	Yes
Pennsylvania	Yes	Yes	No	No	Yes	Yes	No	No
Rhode Island	Yes	Yes	Yes	No	Yes	Yes	No	No
South Carolina	Yes	Yes	No	No	No	No	No	No
South Dakota	Yes	Yes	No	No	No	No	No	No
Tennessee	Yes	Yes	No	No	Yes	No	No	No
Texas	Yes	Yes	Yes	No	No	No	No	No
Utah	Yes	Yes	No	No	Yes	No	No	No
Vermont	Yes	Yes	No	No	Yes	No	No	No
Virginia	Yes	Yes	No	No	No	Yes	No	No
Washington	Yes	Yes	Yes	No	Yes	Yes	Yes	No
West Virginia	Yes	Yes	No	No	No	No	No	No
Wisconsin	Yes	Yes	Yes	No	Yes	No	Yes	No
Wyoming	Yes	No	No	No	Yes	No	No	No
States offering program	50	50	17	5	19	14	10	3

The welfare reform legislation enacted in 1996 made fundamental changes in the federal system of public assistance. The overriding objective of the legislation was to move welfare recipients into work activities (i.e., moving families from point *R* back to point *P* in Fig. 1). In addition to granting state governments a great deal of authority to set their own eligibility and benefit rules, the legislation mandates that most welfare recipients go to work after two years and imposes a five-year lifetime limit for receiving assistance.⁶ In addition to these universal changes in coverage and eligibility, PRWORA includes a number of provisions that specifically limit the extent to which immigrant households can receive public assistance. As

⁶ Grogger et al. (2002) provide a very detailed review of the economic consequences of welfare reform; see also the studies in Blank and Haskins (2001).

Table 3

Trends in welfare receipt and poverty rates, by type of state.

	More generous states		Less generous states	
	Pre-1996	Post-1996	Pre-1996	Post-1996
<i>Welfare participation rate:</i>				
Natives	13.7	11.5	15.8	12.9
Immigrants	20.0	16.8	18.9	11.5
Citizens	13.5	15.3	14.4	11.9
Non-citizens	23.6	18.0	22.1	11.3
Non-citizen, non-refugee	21.7	17.1	21.9	10.9
<i>Poverty rate:</i>				
Natives	13.2	11.9	16.4	13.9
Immigrants	23.7	19.1	26.4	21.3
Citizens	12.4	12.3	12.6	13.1
Non-citizens	30.0	24.0	36.2	26.3
Non-citizen, non-refugee	29.2	24.0	35.8	27.2
<i>Adjusted poverty rate:</i>				
Natives	11.7	10.9	14.6	12.9
Immigrants	22.5	18.6	24.3	21.0
Citizens	11.6	11.7	11.3	12.7
Non-citizens	28.6	23.6	33.6	26.2
Non-citizen, non-refugee	28.1	23.7	32.7	27.1

Notes: The pre-1996 statistics are calculated from the pooled 1995 and 1996 March Current Population Surveys; the post-1996 statistics are calculated from the pooled 1999, 2000, and 2001 March Current Population Surveys. The welfare participation rate gives the proportion of families that received cash benefits, food stamps, or Medicaid.

signed by President Clinton, PRWORA contained two key provisions applying to legal immigrants who did not enter the country as refugees:

1. Most non-citizens who arrived in the country *before* August 22, 1996, the “pre-enactment” immigrants, were to be kicked off from the SSI, food stamp, and Medicaid rolls within a year. This provision of the legislation, however, was never fully enforced.
2. Immigrants who entered the United States *after* August 22, 1996, the “post-enactment” immigrants, are prohibited from receiving most types of public assistance, including Medicaid. The ban is lifted when the immigrant becomes an American citizen.⁷

In contrast to these restrictions on the (legal) non-refugee, non-citizen population, the legislation did not restrict refugee participation in the various public assistance programs. In addition, the legislation continued to prohibit illegal immigrants from receiving most types of aid.

As noted above, the restrictions on welfare use by pre-enactment immigrants were never fully enforced. In particular, the balanced budget agreement reached in 1997 between President Clinton and the Republican-controlled Congress (combined with state actions discussed below) effectively repealed some of the most draconian aspects of the legislation.⁸ As a result, few of the pre-enactment immigrants were actually kicked off the welfare rolls. Moreover, only a relatively small fraction of the immigrant population in the United States arrived after 1996, so that few immigrants are actually barred from receiving assistance. It would seem, therefore, that PRWORA could not have had a large impact on welfare participation rates in the immigrant population. However, the evidence indicates that this is not the case (Fix and Passel, 1999; Borjas, 2001). The welfare participation rate declined in both immigrant and native households after 1996, but the decline was much steeper among immigrants. This finding has led some to conclude that “because comparatively few legal immigrants were ineligible for public benefits as of December 1997, it appears that the steeper declines in non-citizens’ than citizens’ use of welfare... owe more to the ‘chilling effect’ of welfare reform and other policy changes than they do to actual eligibility changes” (Fix and Passel, 1999, p. 8; emphasis added).

It is instructive to illustrate the nature of these trends. The Annual Demographic Files of the Current Population Surveys (CPS) provide detailed information on participation in various social assistance programs during the calendar year prior to

⁷ Post-enactment immigrants are also subject to stricter “deeming” regulations: The income and assets of the immigrant’s sponsor will be deemed to be part of the immigrant’s application for most types of public assistance for up to ten years. Primus (1996) presents a more detailed discussion of the immigrant provisions in PROWRA.

⁸ See U.S. General Accounting Office (1998) for a discussion of the various policy changes that occurred after the enactment of PRWORA at both the federal and state levels.

the survey. I use the 1995–2001 March Supplements, which provide program participation data for the 1994–2000 calendar years, in the empirical analysis reported below.⁹ Because the focus of the paper is on the link between welfare and poverty, and because poverty is defined at the family level, the family is the unit of analysis. I restrict the study to families where the family head is at least 15 years old and does not reside in group quarters. A family will be classified as an immigrant family if the family head was born outside the United States and is either an alien or a naturalized citizen. All other families are classified as native families. In addition, an immigrant family will be classified as a citizen family or a non-citizen family based on the naturalization status of the family head.¹⁰

Table 1 summarizes some of the key trends in program participation for the 1994–2000 period. As suggested by earlier research, the decline in welfare use during this period was steeper among immigrants. In particular, the fraction of native families receiving either cash benefits or food stamps fell from 11.2 to 7.3 percent between 1994 and 2000. In contrast, the fraction of immigrant families receiving similar benefits dropped by 6.3 percentage points over the same period (from 15.2 to 8.9 percent). Moreover, the decline in program participation was limited to non-citizens—precisely the group of foreign-born persons targeted by welfare reform. Their participation rate fell by 10.2 percentage points (from 18.5 to 8.3 percent). The evidence, therefore, suggests that welfare reform—at least at the national level—had a sizable chilling effect on immigrant participation in these welfare programs.

The second panel of Table 1 shows similar trends when the definition of welfare is expanded to include Medicaid. The proportion of native families receiving some type of assistance (defined as cash benefits, food stamps, or Medicaid) dropped by 2.7 percentage points. In contrast, the proportion of non-citizen families receiving some type of assistance dropped by 6.8 percentage points (from 23.7 to 16.9 percent).

Table 1 shows that this relative decline in welfare use in the immigrant population was *not* accompanied by a concurrent rise in the poverty rate. In fact, the fraction of poor families declined more for immigrants than for natives during the period. In particular, the poverty rate among natives fell from 14.6 percent in 1994 to 11.9 percent in 2000, a 2.7 percentage point drop. In contrast, the poverty rate among immigrants fell by 5.9 percentage points, from 23.7 to 17.8 percent. Finally, the data indicate that the poverty rate dropped most for non-citizen families (from 30.1 to 22.3 percent), presumably the group that would have been most adversely affected by the cutbacks in PROWRA.

As noted earlier, the Census definition of poverty status does not include the value of in-kind benefits when calculating family income. The CPS reports the dollar value of food stamps, Medicaid benefits, and housing assistance received by the family. It is instructive to determine the trends in an adjusted poverty measure that adds the dollar value of these in-kind benefits to family income, and then determines whether the family falls above or below the poverty threshold.¹¹ The bottom panel of Table 1 documents the trend in the adjusted poverty rate. The adjusted poverty rate is obviously lower than the official poverty rate, but the two statistics have similar trends. In particular, the adjusted poverty rate for native families dropped by only 1.8 percentage points between 1994 and 2000, as compared to a 2.7 percentage point drop experienced by immigrants, and a 6.1 percentage point drop experienced by non-citizens.

These aggregate trends, though suggestive, do not conclusively prove that welfare *increases* poverty (at least in the immigrant population). After all, the economy was booming in the late 1990s, and the trends in poverty rates may be capturing the differential impacts of the changing economy on the various groups, rather than any behavioral response on the part of immigrants. I will show below, however, that these nationwide trends confound systematic differences within the immigrant population, mainly because they ignore the fact that different states responded differently to the federal restrictions on immigrant welfare use. The various state responses help to identify the structural link between welfare and poverty.

3. State responses to welfare reform

A key provision of PRWORA allows states to enact state-funded assistance programs specifically targeted to their immigrant populations if they wish to attenuate the presumed adverse impact of welfare reform on the foreign-born. Zimmermann and Tumlin (1999) have tabulated the various programs that states extended to immigrants after 1996. These programs include offering TANF, Medicaid, food assistance, and SSI to pre-enactment and/or post-enactment immigrants. As Table 2 shows, almost all states extended TANF and Medicaid to pre-enactment immigrants. A few states went beyond this “minimal” level of generosity and offered other programs to their immigrant populations. It is worth noting that many of the states with large concentrations of immigrants exceeded the minimal level of generosity. In fact, California, the state with a

⁹ There seem to be some data problems with the foreign-born sample in the 1995 survey. In particular, the “official” person weights provided in this survey do not yield an accurate enumeration of the immigrant population in the United States. Passel (1996) gives a detailed discussion of this problem, and uses a complex algorithm to calculate revised weights for each person in the survey. I use the “Passel weights” in all calculations that involve the 1995 survey.

¹⁰ I also used the nativity and citizenship status of other family members to obtain alternative definitions of what constitutes a native or an immigrant family. For example, one can categorize the family as an “exclusively citizen” family if all family members are either native-born or naturalized citizens, and as an “exclusively non-citizen” family if all family members are non-citizens. The qualitative nature of the evidence presented in this paper is not affected by these alternative definitions, so I use the simpler classification in the empirical analysis reported here.

¹¹ The calculation of the adjusted poverty rate uses the Census convention of attributing the poverty status of the primary family to related subfamilies living in the same household. This calculation affects only a relatively small number of families.

Table 4

Impact of welfare reform on welfare participation and poverty status, triple difference estimates.

Groups compared:	Receive some type of assistance		Poverty status		Adjusted poverty status	
	(1)	(2)	(1)	(2)	(1)	(2)
By citizenship status:						
1. Citizens relative to natives	.036 (.020)	.031 (.020)	–.008 (.020)	–.008 (.020)	–.013 (.020)	–.014 (.020)
2. Non-citizens relative to natives	.059 (.016)	.055 (.016)	.034 (.016)	.033 (.017)	.019 (.016)	.017 (.016)
By years since migration						
1. New immigrants relative to natives	.032 (.017)	.027 (.017)	–.007 (.017)	–.009 (.018)	–.011 (.017)	–.013 (.017)
2. Earlier immigrants relative to natives	.064 (.018)	.061 (.018)	.037 (.018)	.036 (.019)	.018 (.018)	.017 (.018)
Immigrants relative to natives	.048 (.013)	.044 (.013)	.014 (.013)	.012 (.013)	.003 (.013)	.001 (.013)
Controls for state fixed effects, with interactions	No	Yes	No	Yes	No	Yes

Notes: Standard errors are reported in parentheses. The regressions have 289,949 observations. All regressions control for the age, race, gender, and educational attainment of the family head; the total number of persons, children, elderly persons, and disabled persons in the family; a vector of dummy variables indicating the family's year of arrival in the United States (if immigrant); a dummy variable indicating if the family head is a refugee; the state's unemployment rate in the particular survey year, and interactions between the unemployment rate and the vector of dummy variables indicating the family's immigration status (e.g., native, citizen, or non-citizen). The "state fixed effects, with interactions" include a vector of state fixed effects, and these fixed effects are interacted with the dummy variable indicating if the observation was drawn from the post-1996 period.

third of the immigrant population, was one of only two states that offered all eight possible programs to immigrants (the other state was Maine).

To show how the "chilling effect" of welfare reform on welfare participation depended on the decisions made by individual states, I pooled the 1994–95 calendar years of the March CPS to provide a snapshot of the population prior to welfare reform, and the 1998–2000 calendar years to provide the respective snapshot after welfare reform.¹² I then grouped states into two categories: "more generous" states (i.e., the states that offered immigrants at least three of the programs listed in Table 2), and "less generous" states (i.e., states that offered two or fewer programs to immigrants).¹³

The top panel of Table 3 summarizes the evidence for the most inclusive measure of welfare participation, which indicates if the family received cash benefits, food stamps, or Medicaid.¹⁴ The table clearly shows that the decisions made by some states to offer a state-funded safety net to their immigrant populations did not influence the trend in native welfare participation. For example, the fraction of native families receiving some type of assistance declined by 2 to 3 percentage points during the period, regardless of whether the state was generous to its immigrant population. However, the trends in immigrant welfare participation were sensitive to the state programs. The fraction of immigrants receiving some type of assistance fell by 3.2 percentage points in the more generous states and by 7.4 percentage points in the less generous states. Moreover, the decline in welfare participation was particularly acute among non-citizen families. The fraction of non-citizens receiving assistance fell by 5.6 percentage points in the more generous states and by almost 10 percentage points (from 22.1 to 11.3 percent) in the less generous states.

The differential trends in welfare participation experienced by non-citizen families living in the less and more generous states are even larger when the sample is restricted to the non-refugee population. Although the CPS do not report the type of visa used by a particular immigrant to enter the country, one can approximate the refugee sample by using information on the national origin of the foreign-born because most refugees tend to originate in a small set of countries.¹⁵ I classified all persons residing in families where the family head originated in the main refugee-sending countries as refugees, while all other persons were classified as non-refugees. The non-citizen, non-refugees residing in the less generous states experienced an 11.0 percentage point decline in their welfare participation rate, as compared to the 4.6 percentage point drop for the non-citizen, non-refugees residing in the more generous states.

The second panel of Table 3 documents the impact of the state actions on the poverty rate of immigrants and natives. The poverty rate among native families fell by roughly the same amount in the two types of states. In the more generous states, the fraction of poor native families fell by 1.3 percentage points (from 13.2 to 11.9 percent), while in the less generous states the native poverty rate fell by 2.5 percentage points. However, the decisions made by states on whether to provide state-funded assistance to immigrants seem to have an impact on non-citizen families. The non-citizen poverty rate fell by

¹² Note that I do not use data from the 1996 and 1997 calendar years in the calculations. This helps to isolate the break in the time series that can presumably be attributed to PRWORA.

¹³ By this definition, 29 states are classified as "more generous."

¹⁴ The sample sizes for the various groups are as follows. In the 1994–1995 pooled sample, there are 105,190 natives, 4896 citizens, and 8966 non-citizens. In the 1998–2000 pooled sample, there are 148,482 natives, 8908 citizens, and 13,512 non-citizens.

¹⁵ The main refugee-sending countries over the 1970–95 period were: Afghanistan, Bulgaria, Cambodia, Cuba, Czechoslovakia, Ethiopia, Hungary, Laos, Poland, Romania, Thailand, the former U.S.S.R., and Vietnam.

Table 5

Sensitivity of impact of welfare reform to specification changes, triple-difference estimates.

Groups compared:	Receive some type of assistance		Poverty status		Adjusted poverty status	
	(1)	(2)	(1)	(2)	(1)	(2)
Families living outside California						
1. Citizens relative to natives	.034 (.019)	.029 (.019)	–.009 (.020)	–.011 (.020)	–.016 (.020)	–.018 (.020)
2. Non-citizens relative to natives	.065 (.016)	.062 (.016)	.023 (.016)	.022 (.017)	.005 (.016)	.004 (.016)
Using native single female-headed families as baseline						
1. Citizens relative to women	.024 (.023)	.016 (.023)	–.022 (.025)	–.026 (.025)	–.025 (.025)	–.031 (.025)
2. Non-citizens relative to women	.058 (.019)	.054 (.020)	.019 (.021)	.016 (.021)	.008 (.020)	.006 (.021)
Using native black families as baseline						
1. Citizens relative to blacks	.017 (.025)	.002 (.027)	–.028 (.026)	–.040 (.028)	–.029 (.026)	–.042 (.028)
2. Non-citizens relative to blacks	.049 (.022)	.036 (.025)	.014 (.022)	–.001 (.025)	.005 (.022)	–.005 (.025)
Controls for state fixed effects, with interactions	No	Yes	No	Yes	No	Yes

Notes: Standard errors are reported in parentheses. The regressions estimated in the sample of families living outside California have 263,414 observations; the regressions estimated with single female-headed households as the baseline have 116,757 observations; and the regressions estimated with black families as the baseline have 63,481 observations. All regressions control for the age, race, gender, and educational attainment of the family head; the total number of persons, children, elderly persons, and disabled persons in the family; a vector of dummy variables indicating the family's year of arrival in the United States (if immigrant); a dummy variable indicating if the family head is a refugee; the state's unemployment rate in the particular survey year, and interactions between the unemployment rate and the vector of dummy variables indicating the family's immigration status (e.g., native, citizen, or non-citizen). The "state fixed effects, with interactions" include a vector of state fixed effects, and these fixed effects are interacted with the dummy variable indicating if the observation was drawn from the post-1996 period.

6.0 percentage points in the more generous states and by 9.9 percentage points in the less generous states. In short, the descriptive evidence suggests that poverty declined the most in those states where the welfare cuts were the deepest.

Finally, the bottom panel of Table 3 illustrates the trends in the adjusted poverty rate. The use of this measure of poverty attenuates the differences in poverty rates across the various groups over time. The non-citizen poverty rate, for example, dropped by 5 percentage points in the more generous states and by 7.4 percentage points in the less generous states. The inclusion of the value of in-kind benefits in the definition of family income, therefore, tends to stabilize the variation in the poverty rate over time.

It is instructive to use a simple regression model to formalize and extend these descriptive results. By controlling for various socioeconomic characteristics, the regression approach helps us determine if the differential trends in welfare participation and poverty observed between the more and less generous states arise because different types of immigrants tend to live in different states, or if the variation can be attributed to state-specific trends in economic activity or social conditions. To illustrate the basic methodology, pool the CPS data available for the calendar years 1994, 1995, 1998, 1999, and 2000 and consider the triple-difference linear probability model:

$$y_{ij} = X_{ij}\beta + \alpha_0 t_{ij} + \alpha_1 I_{ij} + \alpha_2 G_j + \gamma_0(I_{ij} \times t_{ij}) + \gamma_1(I_{ij} \times G_j) + \gamma_2(G_j \times t_{ij}) + \theta(I_{ij} \times G_j \times t_{ij}) + \varepsilon_{ij}, \quad (1)$$

where y_{ij} is a dummy variable indicating a particular type of socioeconomic outcome for family i in state j (such as receipt of public assistance or poverty status); X_{ij} is a vector of socioeconomic characteristics defined below; t_{ij} is a dummy variable set to unity if the observation refers to the post-PRWORA period (i.e., calendar years 1998 through 2000); I_{ij} is a vector of two dummy variables indicating if the family head is a naturalized citizen or a non-citizen (the left-out variable indicates if the family head is native-born); and G_j is a dummy variable indicating the state's generosity towards immigrants, set to unity if the state offered at least three of the assistance programs listed in Table 2.

For simplicity, the regression specification in (1) uses a three-way classification of the immigration status of the population (i.e., natives, citizens, and non-citizens). I account for the immigrant's refugee status as well as year of entry into the United States by including these characteristics as regressors in the vector X . The other socioeconomic characteristics included in the regression are: the family head's age, gender, race, and educational attainment, the number of persons in the family, as well as the number of children, elderly persons, and disabled persons in the family.¹⁶ The regression also includes

¹⁶ Throughout the analysis, the variable indicating the person's age is defined as a vector of dummy variables indicating if the family head is 15–24, 25–34, 35–44, 45–54, 55–64, or at least 65 years old. Similarly, the variable measuring educational attainment is a vector of dummy variables indicating if the person is a high school dropout (less than 12 years), a high school graduate (12 years), has some college (13–15 years), or is a college graduate (at least 16 years). The year of arrival dummy variables indicate if the head of the family arrived after 1995, 1990–94, 1985–89, 1980–84, 1975–79, 1970–74, 1965–69, 1960–64, 1950–59, or before 1950.

Table 6

Trends in family labor supply and family income, by type of state.

	More generous states		Less generous states	
	Pre-1996	Post-1996	Pre-1996	Post-1996
<i>Total hours worked by family (in 1000s)</i>				
Natives	2.206	2.252	2.184	2.223
Immigrants	2.217	2.430	2.124	2.403
Citizens	2.316	2.504	2.304	2.479
Non-citizens	2.162	2.375	1.996	2.356
Non-citizen, non-refugee	2.222	2.400	2.033	2.311
<i>Family income (in 1000s)</i>				
Natives	45.284	51.017	39.567	44.077
Immigrants	37.705	44.325	36.039	42.621
Citizens	50.594	55.795	49.205	53.939
Non-citizens	30.546	35.876	26.718	35.620
Non-citizen, non-refugee	31.013	36.192	26.973	34.930
<i>Family earnings (in 1000s)</i>				
Natives	36.086	41.168	31.255	35.130
Immigrants	31.610	38.403	30.195	36.679
Citizens	40.768	46.540	39.058	43.487
Non-citizens	26.524	32.410	23.921	32.464
Non-citizen, non-refugee	27.346	32.906	24.294	31.714

Notes: The pre-1996 statistics are calculated from the pooled 1995 and 1996 March Current Population Surveys; the post-1996 statistics are calculated from the pooled 1999, 2000, and 2001 March Current Population Surveys.

the state's unemployment rate at time t , and the interaction of this unemployment rate with the dummy variables in the immigration vector I . These interactions control for the possibility that immigrant outcomes are more sensitive to aggregate economic variations than those of natives (as well as net out any potential correlation between the generosity variable, G , and the state unemployment rate). The coefficient vector θ in Eq. (1) measures the impact of the state-provided safety net on the *relative* trend in a particular outcome. In other words, it measures the extent to which the pre- and post-PRWORA change in an outcome differs between states that were less generous and states that were more generous.

Table 4 reports the triple-difference coefficient vector θ estimated from two different specifications of the model. The specification reported in column (1) includes only the variables in the vector X , while the specification reported in column (2) adds a vector of state fixed effects, and these fixed effects are interacted with the time dummy variable (t_i). The state-time interactions capture not only state-specific differences in welfare participation and poverty rates, but also state-specific changes in these variables (induced perhaps by varying economic and political conditions).

The first two columns of the table estimate the impact of the state policies on the relative change in welfare participation. In the most complete specification, the triple-difference coefficient for non-citizens is .055 (with a standard error of .016). The state policies towards immigrants in the aftermath of PRWORA, therefore, had a significant impact on (relative) welfare participation in the non-citizen population. Put differently, non-citizens residing in states that did not offer state-funded assistance programs to their immigrant populations experienced a significant decline in their welfare participation rates. In contrast, these programs had a smaller (and insignificant) impact on the relative welfare participation rate of citizens.

The next two columns of Table 4 report the triple-difference coefficients when the dependent variable is the family's poverty status. This coefficient for non-citizens is positive and significant. It takes on a value of .033 (.017) in the most complete specification. In other words, there is no evidence that the welfare cutbacks significantly increased the poverty rate in the targeted group of non-citizens. In contrast, the welfare cutbacks actually *reduced* poverty in the states that were the least generous and did not attempt to attenuate the presumed adverse impacts of PRWORA—even after adjusting for a vast array of family- and state-specific variables that might influence the trends in the poverty rate.

Finally, the last two columns of the table report the triple difference coefficients when the dependent variable is the adjusted poverty status of the family. The evidence does not suggest any link between the availability of state-funded welfare programs for non-citizens and the adjusted poverty rate in this targeted population. The triple-difference coefficient is .017 (.016). The inclusion of the in-kind benefits in family income suggests that immigrant families living in the generous states become relatively better off—and hence reduces the possibility that welfare programs actually increase the poverty rate. Note, however, that even after including the value of in-kind benefits, there is no evidence that welfare reduces poverty. At best, the income and substitution effects cancel each other out, and welfare does not affect family income.

It is important to stress that the comparison between citizens, non-citizens, and natives conducted in the top panel of Table 4 may be contaminated by the potential endogeneity of the citizenship classification. After all, the immigrants most affected by welfare reform could neutralize many of the restrictions in the legislation by becoming naturalized. In fact, there was a rapid rise in the number of naturalization applications during the period (Wasem, 1998). In 1995, the INS received 960

Table 7

Impact of welfare reform on family labor supply and family income, triple difference estimates, (all dependent variables measured in 1000s).

Groups compared:	Total hours of work		Family income		Family earnings	
	(1)	(2)	(1)	(2)	(1)	(2)
By citizenship status:						
1. Citizens relative to natives	.020 (.075)	.015 (.075)	–2.857 (2.528)	–2.539 (2.534)	–.491 (2.360)	–.128 (2.366)
2. Non-citizens relative to natives	–.145 (.061)	–.129 (.062)	–4.581 (2.084)	–3.947 (2.107)	–4.133 (1.946)	–3.549 (1.968)
By years since migration						
1. New immigrants relative to natives	–.007 (.065)	.001 (.066)	–1.796 (2.220)	–1.409 (2.237)	–.162 (2.072)	.288 (2.089)
2. Earlier immigrants relative to natives	–.137 (.069)	–.131 (.069)	–5.304 (2.340)	–4.664 (2.351)	–4.394 (2.185)	–3.857 (2.196)
Immigrants relative to natives	–.068 (.048)	–.060 (.049)	–3.546 (1.627)	–3.045 (1.651)	–2.319 (1.519)	–1.833 (1.541)
Controls for state fixed effects, with interactions	No	Yes	No	Yes	No	Yes

Notes: Standard errors are reported in parentheses. The regressions have 289,949 observations. All regressions control for the age, race, gender, and educational attainment of the family head; the total number of persons, children, elderly persons, and disabled persons in the family; a vector of dummy variables indicating the family's year of arrival in the United States (if immigrant); a dummy variable indicating if the family head is a refugee; the state's unemployment rate in the particular survey year, and interactions between the unemployment rate and the vector of dummy variables indicating the family's immigration status (e.g., native, citizen, or non-citizen). The "state fixed effects, with interactions" include a vector of state fixed effects, and these fixed effects are interacted with the dummy variable indicating if the observation was drawn from the post-1996 period.

Table 8

Sensitivity of impact of welfare reform on family labor supply and family income, triple difference estimates, (all dependent variables measured in 1000s).

Groups compared:	Total hours of work		Family income		Family earnings	
	(1)	(2)	(1)	(2)	(1)	(2)
Families living outside California						
1. Citizens relative to natives	.027 (.074)	.017 (.075)	–1.253 (2.493)	–.698 (2.498)	.798 (2.324)	1.407 (2.330)
2. Non-citizens relative to natives	–.165 (.062)	–.157 (.062)	–4.398 (2.068)	–3.782 (2.089)	–4.255 (1.928)	–3.616 (1.948)
Using native single female-headed families as baseline						
1. Citizens relative to women	.038 (.069)	.039 (.070)	–1.426 (1.869)	–.585 (1.892)	.461 (1.741)	1.318 (1.764)
2. Non-citizens relative to women	–.102 (.058)	–.100 (.060)	–3.695 (1.555)	–2.833 (1.608)	–3.048 (1.450)	–2.306 (1.499)
Using native black families as baseline						
1. Citizens relative to blacks	.022 (.086)	.014 (.092)	1.256 (2.368)	–1.223 (2.536)	.657 (2.266)	.424 (2.428)
2. Non-citizens relative to blacks	–.129 (.073)	–.142 (.084)	–3.787 (2.004)	–3.595 (2.299)	–3.082 (1.917)	–3.301 (2.200)
Controls for state fixed effects, with interactions	No	Yes	No	Yes	No	Yes

Notes: Standard errors are reported in parentheses. The regressions have 289,949 observations. All regressions control for the age, race, gender, and educational attainment of the family head; the total number of persons, children, elderly persons, and disabled persons in the family; a vector of dummy variables indicating the family's year of arrival in the United States (if immigrant); a dummy variable indicating if the family head is a refugee; the state's unemployment rate in the particular survey year, and interactions between the unemployment rate and the vector of dummy variables indicating the family's immigration status (e.g., native, citizen, or non-citizen). The "state fixed effects, with interactions" include a vector of state fixed effects, and these fixed effects are interacted with the dummy variable indicating if the observation was drawn from the post-1996 period.

thousand such petitions; in 1997, the INS received 1.4 million petitions (US Immigration and Naturalization Service, 1999, p. 172). This increase in the number of naturalization applications generated a huge backlog at the INS, further delaying the time it takes to become a naturalized citizen.

A simple solution to the endogeneity problem is to compare persons who differ in terms of how long they have resided in the United States, rather than in terms of their citizenship status. Immigrants have to live in the United States for five years before they can apply for naturalization, but the lags in the application process imply that it may take 8 years or more before an immigrant can become a naturalized citizen. In 2000, only 10.3 percent of the immigrants who have been in the country fewer than 10 years and 35.3 percent of those who have been in the country between 10 and 20 years are naturalized citizens. In contrast, the naturalization rate for those who have been in the country at least 20 years is 67.5 percent.

The middle panel of Table 4 re-estimates Eq. (1) by defining the immigrant groups in terms of how long the family head has resided in the United States, so that the vector I is now composed of two dummy variables indicating if the foreign-born family head has been in the United States fewer than or more than 10 years (the left out variable again indicates if the family

head is native-born). The regression coefficients indicate that there is a sizable (although not very significant) difference in the triple-difference coefficients measuring relative welfare receipt for the “recent” and “earlier” arrivals. In particular, the coefficient is .061 (.018) for the recent immigrants (who are disproportionately more likely to be affected by PRWORA), and .027 (.017) for the earlier immigrants.¹⁷ As with the earlier classification of immigration status, the relative decline in welfare participation by recent arrivals living in the less generous states did not generate an increase in their poverty rates. In fact, the opposite happened; their poverty rates declined. The triple difference coefficient for the probability that the family is poor is .036 (with a standard error of .019) for the recent immigrants.

Finally, the endogeneity of the citizenship variable can also be avoided by simply contrasting the immigrant and native populations, so that the vector I in Eq. (1) would now contain a single variable indicating if the household is headed by an immigrant. The bottom panel of Table 4 reports that the triple difference coefficient is .044 (with a standard error of .013) for welfare participation, .012 (.013) for poverty status, and .001 (.013) for the adjusted poverty status. In short, the trends revealed by comparing the immigrant and native population are consistent with the previous findings (although the measured impacts are smaller because the comparison ignores the variation within the immigrant population).

There are a number of other sampling and conceptual issues that may cloud the interpretation of the evidence. For instance, it is possible that the clustering of immigrants into relatively few areas—and particularly into California—could drive much of the analysis. After all, a third of the immigrant population lives in California, a state that has relatively generous welfare benefits, experienced a particularly strong economic boom in the late 1990s, and was extremely generous to its immigrant population after PRWORA. As the first row of Table 5 shows, however, the nature of the evidence does not change when households residing in California are excluded from the study. The triple difference coefficient for non-citizens receiving some type of assistance is .062 (.016); and there is a weak positive relation between the availability of the state-funded programs and the poverty rates in immigrant families.

Similarly, it is important to determine if the variable measuring the state’s generosity towards immigrants is isolating programs that specifically benefit immigrants or simply provides a general measure of the state’s assistance to disadvantaged populations. The bottom two panels of Table 5 report the triple-difference coefficients that compare the trends between immigrant and female-headed native families, as well as between immigrant families and black native families, respectively. The coefficients estimated from these alternative specifications are generally consistent with the evidence discussed previously. Consider, for example, the comparison between immigrants and black families. The triple difference coefficient giving the relative difference between non-citizens and blacks is .043 (.026) when the dependent variable is receipt of some type of public assistance; $-.001$ (.025) when the dependent variable is poverty status; and $-.005$ (.025) when the dependent variable is the family’s adjusted poverty status.

In sum, the evidence presented in this section strongly suggests that the state-funded programs helped to attenuate the decline in welfare participation among immigrant families. At the same time, however, these state-funded programs did not lower the poverty rate of the targeted families. If anything, the state-funded programs slightly increased the poverty rate in these families. This evidence is consistent with the theoretical model only if welfare programs generate strong substitution effects.¹⁸ I now turn to a discussion of this behavioral response.

4. Family income and family labor supply

To fully capture the link between family income and labor supply, I restrict my study of the family’s labor supply decision to a single variable that summarizes the work effort provided by the family: the total number of hours worked by all family members.¹⁹ The top panel of Table 6 summarizes the key trends in family labor supply before and after PRWORA, again classified according to the generosity of the state’s welfare offer to immigrants. Consider initially the trends in labor supply experienced by native families. The total number of hours worked by native families was stable in both the less and more generous states. In the less generous states, the typical native family increased total hours of work by 39 h, as contrasted to a 46-h increase in the more generous states.

In contrast, the labor supply of immigrant families—and particularly the labor supply of non-citizen families—was much more variable during the period. The typical immigrant family, for instance, increased its hours of work by about 200 h in the more generous states and by 300 h in the less generous states. Among non-citizens, the typical immigrant family increased total hours of work by about 200 h in the more generous states and by nearly 400 h in the less generous states. The descriptive evidence, therefore, suggests a substantial immigrant labor supply response to the welfare cutbacks.

¹⁷ The t -statistic testing for the difference between these two coefficients is 1.37.

¹⁸ Krueger and Meyer (2002) argue that social insurance programs tend to induce very strong substitution effects, so that the typical elasticities estimated in the labor supply literature are not very useful in predicting the labor supply effects of these programs.

¹⁹ Note that this measure of labor supply captures behavioral responses along two distinct margins: each family member may choose to work a different number of hours as a result of PRWORA, or the legislation may have influenced family composition (which, in turn, affects labor supply). Although a separate investigation of the two channels of influence would be interesting, I am interested in the total impact of the various behavioral responses, since it is this total impact that determines the poverty rate.

Table 9

Instrumental variable estimates of receipt of welfare.

Methodology:	Dependent variable				
	Poverty status	Adjusted poverty status	Annual hours worked (in 1000s)	Family income (in 1000s)	Family earnings (in 1000s)
1. OLS	.218 (.002)	.140 (.002)	–.631 (.007)	– 10.317 (.240)	– 11.617 (.223)
2. IV, using citizenship status	.449 (.280)	.189 (.272)	– 1.876 (1.084)	– 73.749 (39.232)	– 54.413 (34.844)
3. IV, using years since migration	.436 (.280)	.147 (.273)	– 1.784 (1.082)	– 72.407 (39.278)	– 50.803 (34.712)
4. IV, using only immigration status	.274 (.288)	.020 (.289)	– 1.363 (1.106)	– 68.729 (40.759)	– 41.369 (35.669)

Notes: Standard errors are reported in parentheses. The regressions have 289,949 observations. All regressions control for the age, race, gender, and educational attainment of the family head; the total number of persons, children, elderly persons, and disabled persons in the family; a vector of dummy variables indicating the family's year of arrival in the United States (if immigrant); a dummy variable indicating if the family head is a refugee; the state's unemployment rate in the particular survey year, and interactions between the unemployment rate and the vector of dummy variables indicating the family's immigration status (e.g., native, citizen, or non-citizen). All regressions include a vector of state fixed effects, and these fixed effects are interacted with the dummy variable indicating if the observation was drawn from the post-1996 period.

This labor supply response inevitably had a sizable impact on family income. Among native families, family income increased by about \$5000 or \$6000 over the period, regardless of where the native families lived.²⁰ Among immigrants, family income also increased by the same amount regardless of where the native families lived (\$6700 in the more generous states, and \$6600 in the less generous states). It turns out, however, that the increase in the income of immigrant families can be attributed to very different sources, depending on where the immigrant family lives. Consider, in particular, the labor earnings of immigrant families. Labor earnings for the non-citizen families living in the less generous states increased by nearly \$9000, as contrasted to a \$6000 increase in the less generous states.

To investigate the extent to which these trends in labor supply and family income can be attributed to differences in socioeconomic characteristics among the groups or to state-specific trends in economic or social conditions, I re-estimate the regression model introduced in the last section using these measures of labor supply and family income as the dependent variable. Table 7 reports the triple-difference regression coefficient θ from various specifications of the model. The estimated coefficients consistently show that the labor supply of non-citizen families declined substantially in those states that were most generous with their immigrant populations in the aftermath of PRWORA, even after controlling for differences in a vast array of socioeconomic characteristics and state-specific factors. For example, the triple-difference coefficient measuring the impact of the state-funded programs on hours worked by non-citizen families is $-.129$ (with a standard error of $.062$), indicating that the presence of state-funded programs reduced the labor supply of non-citizen families by 129 h a year, relative to the trend observed in both native and citizen families.

The results reported in Table 7 also show that family income for these non-citizen families declined substantially in the more generous states, with much of the decline directly attributable to a decline in labor earnings. The triple-difference regression coefficient for family income is -3.947 (2.107), while the triple-difference coefficient for family earnings is -3.549 (1.968).

The middle panel of Table 8 shows the same type of results when the immigrant groups are classified according to how long the family has resided in the United States (rather than citizenship status). In the most complete specification, the triple-difference coefficient for the most recent arrivals is $-.131$ (.069) in the hours of work regression; -4.664 (2.351) in the family income regression; and -3.857 (2.196) in the family earnings regression.

As before, it is useful to investigate if these results are sensitive to major specification changes. The top panel of Table 8 replicates the regression analysis on the sample of families that live outside California. Even after excluding California, non-citizen families living in the more generous states experienced a substantial decline in labor supply, family income, and labor earnings. Similarly, the bottom two panels of the table contrast the trends in the immigrant groups with native female-headed families or with black families, respectively. The evidence is very consistent. Consider, for example, the comparison between non-citizens and black native families. Relative to blacks, non-citizens in the more generous states experienced a 142-h decline in labor supply, a \$3595 decline in family income, and a \$3301 decline in labor earnings.

In sum, the reduced-form evidence summarized in Tables 7 and 8 strongly imply that the state-funded welfare programs targeted to immigrant families in the aftermath of PRWORA induced strong substitution effects. These substitution effects led to a sizable and statistically significant reduction in family labor supply. This labor supply response, in turn, greatly reduced the labor earnings and family income of the affected families.

²⁰ All measures of family income are deflated to 2000 dollars using the CPI-U.

5. Structural estimates of the link between welfare and poverty

The descriptive evidence summarized in the previous sections presents a strong circumstantial case supporting the hypothesis that public assistance does not reduce measured poverty rates because of a strong substitution effect. More precisely, I documented that poverty rates increased slightly among immigrants who potentially suffered the largest welfare cutbacks in the post-1996 period (i.e., non-citizens living in the less generous states). I now provide estimates of the structural link between poverty and welfare participation. Consider the regression model:

$$y_{ij} = W_{ij} \beta + \delta p_{ij} + \omega_{ij}, \quad (2)$$

where y_{ij} is the dependent variable of interest (such as poverty status) for family i living in state j ; W_{ij} is a vector of socioeconomic characteristics defined below; and p_{ij} gives the probability that the family receives some type of public assistance.

The OLS estimate of the parameter δ is obviously biased. There is, after all, a spurious correlation between poverty and welfare participation. The family's poverty status depends on many characteristics, some of which are unobserved. Persons with favorable values of these characteristics (such as higher levels of human capital) will not qualify and participate in public assistance programs. Many of these factors, however, also reduce the probability that the family is poor. An observed positive correlation between y and p , therefore, does not capture the behavioral tradeoff between poverty and public assistance, but is instead contaminated by the correlation between the probability of being poor and the error term in Eq. (2).

The structural parameter δ can be correctly estimated by using instrumental variables, where the instruments are provided by the exogenous variation in eligibility rules introduced by the immigrant provisions in the welfare reform legislation, as well as by the responses of individual states to the changes in the federal safety net. In particular, consider a first-stage regression model given by

$$p_{ij} = X_{ij} \beta + \lambda Z_{ij} + v_{ij}, \quad (3)$$

where the vector $Z = (t, I, G, I \times t, G \times t, I \times G, I \times G \times t)$. Note that Z contains the same set of variables used in the reduced-form triple difference regression models estimated in the previous sections. The vector W_{ij} in the second stage regression in Eq. (2) is given by $W = [X_k, \tilde{Z}_k]$, where $\tilde{Z}_k = (t, I, G, I \times t, G \times t, I \times G)$. The identification of the structural coefficient δ depends entirely on the exclusion of the triple-difference interaction terms from the second-stage regression. Finally, the variables in the vector X include the age, gender, race, and educational attainment, the number of persons in the family, and the number of children, elderly persons, and disabled persons in the family; and the state's unemployment rate, as well as the interaction between the unemployment rate and the variables in the vector I . Finally, the regression includes a vector of state fixed effects and the interaction between this vector and the dummy variable indicating if the observation refers to the post-1996 period.

The first row of Table 9 reports the OLS correlation between the various dependent variables and the receipt of public assistance by the family. Not surprisingly, families that receive public assistance are more likely to be poor, have lower family incomes, and have lower earnings.

The remaining rows of Table 9 use instrumental variables to estimate the structural parameter δ . Row 2 uses the classification of native, citizen, and non-citizen families to define the vector I . The impact of welfare on the poverty rate is positive and marginally significant; the coefficient is .45, with a standard error of .28. Note, however, that the coefficient is much closer to zero, both numerically and statistically, when the dependent variable is the adjusted poverty status of the family (i.e., the measure of poverty that includes the value of in-kind benefits receives by the family). These coefficients effectively address the question posed by the title of this paper: Does welfare reduce poverty? The answer seems to be that welfare may actually increase poverty—at least in this particular context.

The other columns of Table 9 use alternative dependent variables to estimate the second-stage structural model. In the third column, for instance, the dependent variable is the total number of hours worked by the family. Welfare participation has a sizable and marginally significant negative effect on labor supply. The coefficient is -1.876 , with a standard error of -1.084 . This coefficient implies that a 10-percentage point cut in the probability that a family receives public assistance reduces the family's annual hours of work by 188 h. The evidence, therefore, strongly reveals that welfare programs generate a sizable substitution effect in the immigrant population.

Finally, the last two columns of the table show the structural link between welfare and family income and family earnings, respectively. The structural coefficients δ are typically negative and marginally significant. A 10 percentage point cut in the probability that the family receives public assistance *increases* family income by \$7375, with much of this increase attributable to an increase in family earnings (of \$5441). To summarize, the welfare cutbacks enacted by PRWORA and targeted to the immigrant population induced many of these immigrants to cut their leisure hours and increase hours worked. This strong labor supply response, in the end, reduced family income and increased the poverty rate (as officially measured).

The remaining rows of Table 9 re-estimate the regression models using alternative definitions for the vector I . As noted earlier, the citizenship status of a person may be partly endogenous, as many immigrants become naturalized citizens to escape the impact of the PRWORA cutbacks. One simple solution to this problem is to use the immigrant's year of arrival in the United State to define the various groups. Row 3 of the table defines the dummy variables in the vector I to indicate if the

family head is native, has lived in the United States for more than 10 years, or has lived in the United States for fewer than 10 years. Inspection of the reported coefficients indicates that the results are quite similar to those reported in row 2, which uses the citizenship status of the family head to classify the various groups.

Finally, the last row of Table 9 estimates the regression model using only the information on whether the family head is native-born or foreign-born. Although the coefficients now have larger standard errors, the point estimates are consistent with the overall story. The receipt of welfare assistance increases the measured poverty rate, has no impact on the adjusted poverty rate, and reduces both family income and family earnings.

My interpretation of the evidence summarized in Table 9 implicitly assumes that the state decisions to extend state-funded assistance to immigrants were exogenous. As the summary of choices reported in Table 2 shows, however, the list of states that provided the most generous assistance is far from random. In particular, it seems that states with large immigrant populations were much more likely to be generous in the post-1996 period. The endogeneity of the state choices would bias the results of this study if the states that offered the most generous programs were also the states where poverty rates were going to increase in any case. Although such a scenario is theoretically possible, there do not seem to be any obvious economic or social factors that would generate such a correlation.

6. Summary

The 1996 welfare reform legislation contained a number of provisions that greatly limited the eligibility of many immigrants (particularly non-citizens and non-refugees) to receive many types of public assistance. In response to the federal legislation, many states chose to protect their immigrant populations from the presumed adverse impact of PRWORA by offering state-funded assistance to these groups.

I use data drawn from the 1995–2001 Annual Demographic Supplements of the Current Population Surveys to examine the relation between the immigrant-related provisions in PRWORA—as modified by the subsequent state responses—and poverty rates in the immigrant population. In the absence of any behavioral response, one would suspect that poverty rates increased sharply in the population most adversely affected by the cutbacks, the non-citizens living in states that did not offer state-funded assistance to their immigrant populations. In other words, as the benefit cuts took effect, the proportion of immigrants families falling below the poverty threshold should have increased.

The empirical analysis indeed indicates that welfare participation rates dropped substantially in the targeted immigrant population. However, the data also indicate that the expected rise in poverty rates did not materialize. If anything, poverty rates actually *declined* slightly in this group.

The dissonance between what one could have reasonably expected to find and what the data actually indicate is explained by a strong behavioral response on the part of immigrant families. The families most likely to be adversely affected by the new restrictions significantly increased their labor supply and raised their labor earnings. This behavioral response allowed the affected families to more than offset the adverse impact of the welfare cutbacks on total family income. As a result, poverty rates either remained stable or decreased slightly in the population of affected immigrants.

Although trends in poverty rates play a significant role in the debate over social policy, it is important to stress that the documented link between welfare and poverty says little about the related (and more interesting) question of whether welfare improves the well-being of disadvantaged families. The welfare cutbacks in PRWORA must have reduced the utility of families displaced from the welfare system (or these families would not have chosen to be in the programs in the first place). Similarly, some cutbacks in particular in-kind programs, such as food stamps and Medicaid, may change the nature of the consumption basket chosen by the affected households in ways that may not be socially optimal (Borjas, 2004). Nevertheless, the evidence presented in this paper strongly suggests that, at least in terms of officially measured poverty rates in immigrant families, the welfare state is not a panacea. For these families, welfare contributes to poverty.

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