

Assessing the Impact of Welfare Reform on Single Mothers*

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Abstract

Since the implementation of Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996, the prevalence of welfare participation among single mothers has dropped dramatically, from 25% in 1996 to 9% today. At the same time, the fraction of single mothers who work increased from 74% in 1996 to 79% today. But these trends actually began as early as 1993-1994. The goal of this paper is to ascertain the contributions of various components of welfare reform, and other contemporaneous economic and policy changes, to the huge decline in welfare participation and increase in work among single mothers from 1993-2002. To this end, we have constructed an extensive data set that characterizes changes in welfare policy, as well as other important determinants of welfare participation and work, at the State level for the 1980-2002 period. Using these data, we develop a model that rather successfully explains both *levels* and *changes* in welfare and work participation rates across States, time, and various demographic groups, for the whole 1980-2002 period. Simulations of the model imply that:

- The key economic and policy variables that contribute to the overall 23 percentage-point decrease in the welfare participation rate from 1993-2002 are, in the order of relative importance, work requirements (57%), the EITC (26%), time limits (11%) and the macro economy (7%). This importance ranking holds for all years since 1997, although the quantitative contributions of these factors differ by demographic group.
- The key economic and policy variables that contribute to the overall 11.3 percentage-point increase in the work participation rate from 1993-2002 are, in the order of overall relative importance, the EITC (33%), the macro economy (25%), work requirements (17%) and time limits (10%). However, there are interesting differences in the relative importance of these variables across demographic subgroups, and by time period.

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1. Introduction

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), signed into law in 1996, significantly changed the U.S. welfare system. PRWORA replaced the Aid to Families with Dependent Children (AFDC) program with Temporary Assistance for Needy Families (TANF). Since its inception in 1935 as part of the Social Security Act, AFDC had been the main welfare program providing assistance to low-income single mothers. But a number of factors, particularly the rapid growth in the never-married single mother population, and the growth of caseloads in the early 1990's (see Figure 1), rendered the program unpopular.¹ Under the new TANF program, the prevalence of welfare participation among single mothers has dropped dramatically, from 25% in 1996 to 9% today. At the same time, the fraction of single mothers who work increased from 74% in 1996 to 79% today. The goal of this paper is to try to ascertain what features of welfare reform, if any, have been most responsible for this decline in welfare participation and increase in work among single mothers.

Our task is complicated by two factors. First, a key feature of PRWORA was that it reduced federal authority over welfare policy, giving the States much greater leeway in the design of their own individual TANF programs. A great deal of program heterogeneity has emerged across States, making it very difficult to develop a set of variables that comprehensively characterize the nature of different State TANF programs. Second, there have been a number of other recent developments that may also account for changes in welfare participation and work that have occurred since 1996. These factors, such as the strong macro economy of 1996-2000, and the significant expansion of the Earned Income Tax Credit (EITC) after 1993, must be controlled for if we want to isolate the impact of particular elements of State TANF policies.

The idea that factors other than PRWORA may account for the lion's share of recent caseload declines is lent credence by the fact that the dramatic drop in AFDC participation (and increase in work) among single mothers actually began in 1993-1994 (see Figure 2). From 1993 to 1996, AFDC participation fell from 32% to 25%. On the other hand, beginning around 1993, many States began to obtain federal waivers that permitted them to adopt "TANF-like" reforms of State AFDC programs. Features introduced via State waivers included work requirements, time limits on benefits, sanctions for failure to meet work requirements and family caps. Perhaps these changes contributed substantially to caseload declines even prior to PRWORA.

¹ Prior to PRWORA, the AFDC program underwent a number of changes/overhauls. For instance, in 1961 the AFDC-UP program was created, in 1967 the AFDC benefit reduction rate was reduced to 2/3 from its original level of 100%, in 1981 the benefit reduction rate reverted to 100%, and in 1988 the Job Opportunities Program (JOBS) was created and AFDC-UP was mandated in all States. See Garfinkel and McLanahan (1986) and Moffitt (2001) for the major historical developments in the AFDC program.

At the same time that PRWORA delegated greater control of welfare policy to the States, it also mandated many popular State-level waiver features, such as time limits and work requirements. In order to understand the sense in which the federal law “mandates” certain features of State TANF programs, one must understand how federal TANF funds are distributed to the States. Under AFDC, States received federal matching funds based on their AFDC expenditures. PRWORA converted the federal matching funds to block grants. The block grant for a State was fixed at a level related to the peak-year Federal funding levels of AFDC benefits and other related programs. States were given substantial leeway in how block grant funds could be used. For example, States can use the TANF block grant to support childcare, an important post-reform development that we will come back to later. However, to avoid fiscal penalties on the Federal block grant, States are required to maintain their spending on assistance for needy families at no less than 75-80% of their pre-1996 level (so called “maintenance of effort” or MOE rule).²

PRWORA requires State TANF programs to set a 5-year limit on *federally funded* aid, and States may only exempt 20% of their caseload from the limit. States may elect to set shorter time limits, and many have. However, any assistance provided to recipients beyond the 5-year limit must be financed solely out of State funds. Three States (New York, Michigan and Vermont) have effectively decided not to enforce the 5-year limit. And many States (like California) only *reduce* benefits when the time limit is reached. PRWORA also requires that a specific and rising percentage of States’ total TANF caseloads must engage in work activities, and that States must impose a work requirement on any recipient who receives TANF for over 2 years (i.e., a work requirement time limit). Again, States may set a shorter work requirement time limit, and many have done so. States also vary greatly in the sorts of exemptions from work requirements that they allow, and in the penalties they impose if work requirements are not satisfied.

Roughly contemporaneous to the changes implemented by PRWORA, the U.S. economy experienced one of its longest post-war expansions during the Clinton Administration. National unemployment rates were below 5% from 1997 to 2001, and dropped to as low as 4% in 2000 (see Figure 2). At about the same time, the EITC was dramatically expanded both in the number of recipients and the generosity of the credit. Figure 3 shows that the number of federal EITC recipients increased from about 6 million in 1980 to 19.2 million in 2002. The Federal EITC phase-in rate for a single mother with one child increased from 10% in 1980 to 34% in 2002. Moreover, many States have enacted additional State EITC programs (for more details of the EITC expansion, see Section 3.B.2.I). Other contemporaneous policy changes include the Medicaid expansion as a

² Moreover, States can carry TANF funds from fiscal year to fiscal year without limit, even though the use of carried-over funds, in principle, is more limited than same-year funds (in practice, such restrictions do not matter).

result of Omnibus Budget Reconciliation Act (OBRA) of 1989, which dramatically expanded health insurance coverage for low-income women and children who were not receiving cash welfare benefits. Moreover, expenditures on Child Care and Development Fund (CCDF) increased from \$1.4 billion in 1992 to \$7.9 billion in 2002 (see Figure 4). In fact, childcare subsidies and other non-cash benefits now exceed cash assistance in total Federal and State spending under TANF programs. Federal and State governments have also substantially increased expenditures for child support enforcement (also see Figure 4). Naturally, all of the above changes in the economic and policy environment could affect the incentives of single mothers to participate in welfare or work.

[Figures 1-4 About Here]

Before proceeding, it is useful to summarize the basic features of the historical evolution of average yearly AFDC/TANF caseloads, depicted in Figure 1:

- First, the steep increase in AFDC caseloads in the late 1960s and early 1970s occurred at a time of enormous expansion in government public assistance programs, with the establishment of Food Stamp and Medicaid programs in that period. Moreover, between 1968 and 1971, the Supreme Court abolished the absent father rule, residency requirement, and regulations that denied aid to families with “employable mothers.” These court-rulings increased the welfare take-up rate substantially.
- Second, from the early 1970s until 1990, AFDC caseloads were almost flat for 15 years, with a mild increase in the early 1980s due to back-to-back recessions. The increase of benefit reduction rate from 2/3 to 100% during President Reagan’s first term quickly stopped that up-tick.
- Third, and somewhat puzzling, is the dramatic increase of the caseload from 1990 to 1994. This increase is puzzling because the 1990-91 recession was quite mild, and moreover, the 1988 Family Support Act mandated that “work eligible” AFDC recipients participate in welfare-to-work programs. It is also puzzling because the welfare participation rate of single mothers did not exhibit a steep increase (see Figure 2). We discuss various explanations for this phenomenon in Section 2.B.
- Fourth, welfare caseloads dropped spectacularly after the peak in 1994. The total caseload dropped more than 60% from the peak of 1994 to 2002. This drop is roughly contemporaneous to the sustained economic expansion of 1992-2000. However, the recession that began in March 2001 has only slightly increased welfare caseloads in some States, while the national caseload has continued to decrease slightly.

How did the different components of welfare reform, and other contemporaneous economic and policy changes, contribute to the spectacular drops in both the welfare participation rate of single mothers, and welfare caseloads, that have occurred since 1993? What were the relative contributions of time limits, work requirements, EITC, childcare

subsidies, and the strong macro economy? These are questions of immense importance for both policy makers and academic researchers. The answers matter for the design of improved welfare policies, and for understanding how welfare policies should respond to macro economic conditions. In this paper we try to shed some light on these questions.

A large quantity of research has already been devoted to the questions that we address here. We review some of the key papers in this literature in Section 2. As we will see, all these papers have focused on one or a few of the policy and economic variables of interest. Thus, they are unable to provide measures of the separate contributions of all the elements we mentioned above. Furthermore, we would argue, studies that focus on only a few policy variables may find biased estimates of the effects of the policies in question – due to the exclusion of other important policy and environmental factors.

One of our main contributions in this paper is the construction of a detailed data set that includes measures of all the key economic and policy elements described above, on a State-by-State and year-by-year basis for the entire 1980-2002 period. One concern for incorporating so many features in one grand analysis was the possible *collinearity* among the policies.³ This is a concern since many of the policies we are interested in were incorporated roughly contemporaneously. Our approach to deal with this problem is to exploit both cross-State variation on the timing and form of particular policies, as well as cross-sectional variation in how individuals with different characteristics are differentially impacted by seemingly collinear policies. We provide detailed discussions of the sources of variation that we use to identify the effects of each variable of interest in Section 3.B.

The individual level data we use, in conjunction with the economic and policy variables we compiled ourselves, is the Annual Demographics Supplement to the March Current Population Survey 1981-2003 (henceforth, March CPS),⁴ which covers the period 1980-2002. From the CPS, we extracted the data on single mothers with dependent children. Specifically, we refer to women who were not living with a spouse at the time of the interview and who had at least one dependent child age 17 or younger. Such single mothers may be divorced, widowed, separated or never married; the children may be their biological, step or adopted children as long as the single woman could claim them as her dependents. Single-mother families are not necessarily single-adult families since single mothers may be living with other adults including, for example, their parents or their unmarried partners or other unrelated individuals.⁵

³ For instance, Grogger (2003) states: “Characterizing each reform is a difficult enterprise, however, which in conjunction with significant collinearity issues leads me to take a somewhat less ambitious approach here.”

⁴ In 2003, the Census Bureau renamed the March CPS as the Annual Social and Economic Study.

⁵ Single women with dependent children are the main recipients of AFDC and TANF benefits. While it is true that single-parent families maintained by fathers, or child-only families, or two-parent families where

We achieve two main goals in this paper. First, we show that, with a comprehensive list of control variables that include demographic, economic and policy variables and a rich set of interaction terms, we are able to develop a model that rather successfully explains both the *level* and *changes* in the welfare and work participation rates across States, time, and various demographic groups, for the whole 1980-2002 period. Second, using simulations of the model, we estimate the contributions of the various components of welfare reforms and other contemporaneous economic and policy changes to welfare and work participation rates for single mothers. Of course, our confidence in our counterfactual decomposition relies, to a large degree, on the success of our empirical model in fitting the historical data on work and welfare participation rates.

Our main findings are summarized as follows:

- The key economic and policy variables that contribute to the overall 23 percentage-points decrease in the welfare participation rate from 1993-2002 are, in the order of relative importance, work requirements (57%), the EITC (26%), time limits (11%) and the macro economy (7%). This importance ranking holds for all years since 1997, although the quantitative contributions of these factors differ by demographic group.
- The key economic and policy variables that contribute to the overall 11.3 percentage-point increase in the work participation rate from 1993-2002 are, in the order of relative importance, the EITC (33%), the macro economy (25%), work requirements (17%) and time limits (10%). However, there are interesting differences in the relative importance of these variables across demographic subgroups, and by time period.

These findings have important policy implications. It seems that while work requirements are very effective at getting single mothers off welfare, they are not as effective at getting them to work. Indeed whether they work or not after leaving welfare depends crucially on the macro economy. One big success in public policy has been the expansion of EITC, which contributes significantly to both getting single mothers off welfare and getting them to work. Our research highlights the crucial difference between “leaving welfare” and “work.” Indeed we document the somewhat troubling development that nearly one quarter of welfare leavers actually did not start work.

The remainder of the paper is organized as follows. In Section 2, we provide a critical literature review of some influential prior studies. In Section 3, we provide details of both the individual level data from March CPS, and the relevant economic policy variables, that we use in our empirical analysis. In Section 4, we give some descriptive statistics that

the primary earner is unemployed can also be eligible for AFDC/TANF, single-mothers account for the large majority of the caseload.

emphasize the rich interactions between economic and policy variables and demographic characteristics of single mothers, and use these to motivate our empirical model. In Section 5, we describe our empirical specification. In Section 6, we present and interpret our empirical estimates, provide evidence on the fit of our empirical model, and use the model to decompose the contributions of different economic and policy variables to changes in welfare and work participation rates. Section 7 concludes and provides directions for future research.

2. A Critical Literature Review

In this section we critically discuss some of the key papers in the literature and highlight the differences between their approaches and our study.⁶

A. Studies on the Effects of Time Limits

The aspect of the 1996 welfare reform that has received the greatest attention is the elimination of the entitlement status of welfare, and in particular the imposition of time limits on welfare receipt. PRWORA created a 5-year lifetime limit on TANF receipt, in the sense that States may not use federal funds to pay TANF benefits to any adult for more than 60 total months during the person's lifetime (except in limited special circumstances). But time limits did not originate with PRWORA. Many States had already instituted time limits on welfare receipt under waivers. Given the perceived centrality of time limits to the reform strategy, many studies have attempted to estimate the effects of time limits on welfare participation and other aspects of behavior.

Notable studies of time limits include Grogger (2000, 2003) and Grogger and Michalopoulos (2003). These papers exploit the fact that, under both AFDC and TANF rules, only families with children under 18 are eligible for benefits. Thus, time limits should have no (direct) impact on the behavior of single mothers whose children are sufficiently old that they would reach age 18 before the limit could come into play.^{7,8} Therefore, in a before-and-after design, any change in welfare participation by mothers with older children should be due solely to other time varying factors besides the imposition of time limits (such as changes in general economic conditions and/or other

⁶ This literature review is not meant to be comprehensive and many interesting and important papers are not discussed. Grogger, Karolyn and Klerman (2002) and Blank (2002) provide extensive literature reviews.

⁷ Of course, there may be indirect impacts. For instance, if time limits reduce welfare participation among other groups in society (such as mothers with young children), this may increase the "stigma" from welfare participation, which would indirectly impact participation rates among mothers with older children.

⁸ More generally, the strength of the incentive to "bank" eligibility depends on the age of a woman's youngest child. If her youngest child is over 13, a newly imposed five-year time limit does not change her choice set at all. However, if her youngest child is under 13, then, the younger the child is, the greater is the option value of preserving welfare eligibility. Thus, *ceteris paribus*, time limits should enhance work incentives more for single mothers with younger children.

components of welfare reform). The change in participation rates for mothers with older children thus provides a baseline estimate of the impact of all these other factors. The mothers with older children can therefore serve as a “control group” to estimate the effect of time limits. Under the assumption that all other time varying factors impact behavior of mothers with old and young children in the same way, any incremental participation rate change among mothers with younger children isolates the effect of time limits alone.

This idea is illustrated in Table 1, which is adapted from Grogger (2000). A 5-year time limit should not have affected single mothers with youngest children in the 13-17 year age range. Thus, the drop in their participation rate from 16% to 11% should be attributable entirely to other time-varying factors (like work requirements or the macro economy). This gives us a 5 percentage points as our estimate of the impact of all these other factors. Next, consider single mothers with youngest children in the 0-6 year age range. They are potentially impacted by time limits, since they could use up 5 years of benefits long before their children reach age 18. Welfare participation dropped 17.5 percentage points among this group. Using these figures, we can estimate the impact of time limits using the Difference-in-Difference (DD) approach. Of the 17.5-point drop in participation for single mothers with young children, we attribute 5 percentage points to the other factors besides time limits, since that is the change we observe for the control group that was not subject to time limits. This leaves 12.5 percentage points as the drop in welfare participation attributable to time limits. This is a very substantial effect. It implies that 71% of the drop in welfare participation among mothers with young children was due to time limits.

[Table 1 About Here]

As Grogger (2000) hastens to point out, this estimate relies on a number of strong assumptions. Most critically, it supposes that all the “other factors” have the same impact on mothers with old vs. young children. This is a very strong assumption, since mothers with young vs. old children differ in important ways. To see this, note that Table 1 also shows that welfare participation rates are much higher among single mothers who have young children (41%) than among single mothers who have older children (16%). This alone illustrates the dramatic difference between the two groups, and calls into serious question the assumption that they would be impacted in the same way by other aspects of welfare reform or by the business cycle.

The fact that the baseline participation rates differ so greatly between the two groups creates another serious problem for the simple DD approach. Even if it were true that unmeasured time varying factors have a common impact across groups, to use a DD approach we need to know whether the “common impact” applies when we measure impacts in levels or percentages. This point is also illustrated in Table 1. The last column

shows percentage changes in participation rates for each group. The single mothers with older children had a 31% decline in welfare participation, while those with young children had a 42% decline. So, if we assume that the unmeasured factors have a common percentage-change effect across groups, the DD estimate of the effect of time limits on mothers with young children is 11%. This implies that only 26% of the drop in welfare participation among mothers with young children was due to time limits. Thus, time limits seem much less important when we measure impacts in percentages rather than levels.⁹

We contend there is only one way around this problem, and that is to do the hard work of trying to measure and control for a rich set of time varying factors that may have differentially affected people with different characteristics, and to allow for interactions between these factors and personal characteristics in our model. The DD approach is *not* a panacea for dealing with unmeasured time varying factors when the treatment and control groups are different, especially when they have different baseline participation rates.¹⁰

Recognizing this, Grogger (2000) extends the simple DD analysis described above to control for four specific time varying factors that he believed might have differential effects on women with young vs. older children: the unemployment rate, the minimum wage, the real level of welfare benefits (all measured at the State level), and a dummy for “any statewide welfare reform.” Controlling for these factors, along with State dummies and State specific quadratic time trends, the estimated impact of time limits on welfare participation for single mothers with children aged 0-6 drops to 8.6 percentage points.¹¹ This is still 49% of the overall 17.5 percentage point drop in participation for this group.

Thus, Grogger’s results imply that time limits were a major factor driving down caseloads. His estimates of State unemployment rate effects are all insignificant, implying that the strong macro economy over the period did not play a significant role. His estimates do imply that falling real AFDC/TANF benefits played a significant role for mothers with younger children. Interestingly, neither the time limit dummy nor the general reform dummy nor the unemployment rate nor any of his other controls are significant for the single mothers with older children. Thus, Grogger’s results apparently

⁹ To dramatize the possibility of this bias, consider the following thought experiment. Suppose that time limits did nothing, but that other omitted factors (like work requirements and work incentives) caused all people to leave welfare. We would get a change of -0.41 for group 1, -0.16 for group 2, and hence a difference of -0.25. So we would estimate the effect of time limits as 25 percentage points, when in reality the effect is zero. If instead we had known that the omitted factors operated on percentage changes rather than levels, we would get changes of -100% for group 1, -100% for group 2, giving a difference of 0%. That would be the correct estimate of the effect of time limits. But of course we have no way to know which specification -- levels or percent changes -- is correct without a priori information.

¹⁰ This criticism actually applies to many recent applications of the DD methodology, which have often involved situations where the “treatment” and “control” groups are rather different at baseline.

¹¹ We refer to the results in column 1 of Table 5 in Grogger (2000), which we take to be his main results.

attribute the 31% drop in welfare participation for this group to the State specific time trends. These may be picking up the effect of the EITC expansion, a general change in “culture,” or some other factor not controlled for in the model. Indeed, when controlling for EITC expansion, Grogger (2003) found an even smaller effect of time limits on welfare use, now accounting for only about one eighth of the decline in welfare use and about 7 percent of the rise in employment rate since 1993. [This is actually rather close to our estimates of 11% and 10% for time limit contributions to welfare and work changes.]

An important limitation of Grogger’s approach is that all other aspects of welfare reform are summarized in the “any statewide welfare reform” dummy variable. This precludes him from estimating effects of other specific policy changes. Furthermore, it will not adequately control for omitted factors if demographic groups are differentially affected by other reforms. As an example, one specific feature of welfare reform that Grogger omits, and that could potentially lead to upward bias in his estimates of time limit effects, is the massive expansion of subsidized day care for low-income families that occurred largely as a result of PRWORA (see Figure 4). Under CCDF rules, funds cannot be used to subsidize day care for children over 12, except in very rare instances (e.g., special needs children). Hence, the day care expansion should not have affected single mothers whose youngest child is 13-17 years old. And, obviously, subsidized day care could have a bigger effect on mothers with pre-school aged children. That is, the effects of other contemporaneous reforms omitted from the analysis could indeed be age-dependent. We note, somewhat facetiously, that if we chose to ignore time limits rather than day care, we could use Table 1 to obtain a DD estimate of the effect of expanded day care spending.¹²

The analysis of Grogger and Michalopoulos (2003) is less subject to these sorts of criticisms. They estimate the effect of time limits using data from a randomized experiment, the Florida Family Transition Program (FTP). This was a fairly small experiment in which welfare recipients in Escambia County were randomized into a treatment group that was subject to a 2 to 3 year time limit and a control group that was not.¹³ They estimate that the two-year time limit reduced welfare participate rates among single mothers with youngest children in the 3-5 year old range by 7.4 percentage points (from a base rate of 40.3 percent) during the first two years after the time limit was imposed. This estimate implies significant effects of time limits, but it is difficult to

¹² Using a structural model of welfare participation and labor supply, estimated on data from the 1980s, Keane (1995) predicted that a policy of subsidizing single mother’s fixed costs of working (i.e., primarily day care and transport costs) would reduce their AFDC participation rate from 25% to 20.8% (a 17% decline) and increase their employment rate by 7 percentage points from a base rate of 60%. Thus, our prior is that large effects of day care subsidies are plausible.

¹³ A confounding feature of this experiment was that a childcare subsidy was also provided to both groups. Thus, the experiment does not estimate the effect of time limits alone. But, assuming no interaction between childcare subsidies and time limits, the treatment/control differences should net out effects of childcare.

translate it into a prediction for the aggregate welfare caseload, for two reasons. The estimate is based on a two-year limit whereas most States have longer limits, and it conditions on a sample of women who had applied for welfare in the first place. Thus it tells us nothing about how time limits would affect entry.

Furthermore, we do not think it is possible to generalize the significant effects of time limits in the FTP context to the broader national context. Bloom, Farrell, Fink and Adams-Ciardullo (2002, henceforth BFFA) provide an excellent discussion of how time limits have been implemented in practice in many States. They state (p. 140) that: “as a relatively small pilot program ... FTP was generously funded and heavily staffed,” and thus “With small caseloads, workers were able to have frequent contact with participants.” They go on to point out that “Recipients who came within six months of reaching their time limit and who were not employed were referred to specialized staff known as ‘transitional job developers,’ who worked intensively to help these individuals find jobs. The transitional job developers sometimes met with recipients several times a week, and they offered employers generous subsidies to hire their clients.” Finally, they note that: “... nearly all of those who reached the time limit had their benefits fully cancelled. Very few extensions were granted: only a handful of cases retained the child’s portion of the grant; and no one was given a post-time limit subsidized job.”

This combination of intensive case management and strict enforcement of the time limit is wildly *at variance with the norms* under TANF. In fact, BFFA describe a system where, in practice, time limits are only sporadically enforced because extensions and exemptions are so common. They note that roughly 44% of the caseload resides in States like New York, Michigan and Vermont, which do not have time limits, or California, Maryland and Washington, which only reduce (rather than terminate) benefits when the time limit is reached. Furthermore, several States, like Oregon, stop the welfare time clock if a recipient is participating in required work/job search/training activities, and many States, like Connecticut, provide liberal extensions to the time limit if recipients have made a “good faith effort,” which basically means meeting the work/job search/training requirements of the State TANF plan and avoiding sanctions.

Thus, in many States, time limits are practically irrelevant. A typical comment can be found in U.S General Accounting Office (GAO 1998a, p. 55): “In Oregon, months count toward the time limit only if the family fails to cooperate, and the State has graduated sanctions resulting in a full family sanction for failure to participate [in required work activities]. Officials told us they do not expect any families to ever reach the State time limits in Oregon because, if families are cooperating, they can expect to receive cash assistance indefinitely (funded by the State); if families are not cooperating, their grants will be terminated long before the time limit is reached.” BFFA describe data on 54,148

TANF recipients who had reached the federal 5-year time limit by December 2001. The bulk of these were in Michigan and New York, since these States implemented TANF relatively early on. But these States do not impose the federal limit. Of 5,143 recipients in the other States that did nominally impose time limits, BFFA report that 51% continued to receive TANF benefits under some sort of extension. The most common extension criteria were “good faith effort” in Connecticut, South Carolina and Tennessee, “disabled or caring for disabled family member” in Georgia, Louisiana, and Utah, as well as “to complete education or training” in Georgia, “high unemployment” in Texas, and “other” in “Ohio.”

B. Studies of other TANF and TANF-like Reforms

A number of prior studies have attempted to look more broadly at the whole range of factors that might drive caseloads. The paper by Blank (1997) was a pioneering effort in this direction. She examined the evolution of welfare caseloads by State and by year over the period 1977-1995. Her data was entirely from the pre-TANF period. However, a number of States already had waivers in the early 1990s, making it possible to examine the impact of a number of TANF-like reforms.

It is useful to give details about Blank’s specification, because it guides much of the subsequent work in this area. Her dependent variable is the log ratio of a State’s AFDC caseload to the female population aged 15-44. Given that most AFDC recipients are in this age range, the dependent variable can be taken to approximate the percentage of women in this age group who participate in AFDC. This variable ranged from 6 to 8% over the sample period, and was 7.4% in 1994. The policy variables include the State specific AFDC “grant” for a family of 3 (i.e., the benefit for a family with no earnings or outside income), and dummies for whether the State had a waiver and, if so, whether this included time limits, enhanced work requirements, fewer exemptions from or more severe sanctions for failure to meet work requirements, or family caps. Controls for aggregate economic conditions were the State unemployment rate (and two lags of this variable), the median wage, and the 20th percentile wage. She also controlled for State demographics such as average education, the percent black, the percent elderly, the percent who are recent immigrants, and the percent of households headed by single females.

Blank’s results imply that caseloads are mildly sensitive to the unemployment rate. She estimates that the elasticity of the participation rate with respect to a sustained increase in the unemployment rate is roughly 0.25.¹⁴ This means that a 3-point increase in the unemployment rate would raise the participation rate by about 11% after 3 years. Her

¹⁴ The sum of coefficients on the current and two lags of the unemployment rate is .038. If $\log(P) = .038U$, where P is the participation rate and U is the unemployment rate, then the elasticity of P with respect to U is .038U. The mean unemployment rate in the data is 6.583, so at this mean the elasticity is .25.

results also imply that participation is quite sensitive to benefit levels. The estimated elasticity of the participation rate with respect to the benefit level is 0.56.

There are a few notable shortcomings of Blank's study. First, a salient feature of the data (see Figure 1) is that the AFDC caseload was quite flat from 1977 through 1989 (in the 3.5 to 3.9 million family range). But it rose sharply in the 1990-1993 period,¹⁵ peaked in March 1994 at 5.1 million families, and then began to drop sharply in mid-1994. One might suspect that the "bulge" was due to the mild recession of the early 90s. But, prior to 1990, AFDC caseloads never exhibited much cyclical sensitivity. In fact, Blank shows that half of the caseload increase in 1990-1994 was due to increases in child-only and AFDC-UP cases.¹⁶ Thus her dependent variable exaggerates the increase in the AFDC participation rate among single females aged 15-44 during that period. Presumably, in an attempt to fit this exaggerated increase, OLS would attribute it to the recession, leading to an overestimate of the effect of unemployment. Despite this, Blank (1997) notes that her model still does not succeed in explaining the increase in caseloads in 1990-1994.

Second, Blank obtains very puzzling results for the effects of specific reform features. The coefficient on the "any major State welfare waiver" dummy implies that a waiver reduces the participation rate by roughly 11%. However, when this is broken down into a set of dummies for different aspects of waivers, the dummy for whether a State imposed time limits is insignificant (and the wrong sign), and work requirements are insignificant as well. The dummy indicating that a State imposes harsher sanctions for failure to satisfy work requirements is estimated to have a significant *positive* effect on caseloads. The variables estimated to significantly reduce caseloads are dummies for reduced JOBS exemptions and for whether the State imposed a "family cap" (a policy whereby AFDC benefits are not increased by the usual per child increment if a woman has an additional child while already on AFDC). The later is estimated to reduce the caseload by roughly 18%, which seems highly implausible. As Blank states, "the impact of family caps on the caseload in the short run should be minimal. It merely holds benefits constant for women who are already on the caseload, it does not remove anyone from the rolls."

The Council of Economic Advisors (CEA 1997, 1999) conducted a similar exercise using State level data from 1976-1996, updated through 1998 in the later paper. These papers

¹⁵ The AFDC caseload rose from 3.77 million families in 1989 to 4.98 million families in 1993.

¹⁶ The increase in AFDC caseloads during 1990-1994 may have also been related to the 1986 Immigration Reform and Control Act (IRCA), which legalized 2.7 million undocumented immigrants residing in the U.S. since 1982, as well as certain seasonal agricultural workers, and made these legalized immigrants eligible for welfare after a *five-year moratorium* of benefits. Immigrants legalized under IRCA were more likely to be poor than immigrants who entered legally, and legalization may have encouraged resident immigrants to apply for benefits for their children even if they themselves were barred from aid receipt in the five-year moratorium. Since most of these immigrants were legalized in 1987 and 1988, the five-year moratorium on welfare receipt ended by the beginning of 1994 (see MaCurdy, Mancuso and O'Brien-Strain 2000, 2002).

use much sparser sets of controls than Blank (1997). The only non-welfare factors included in the models are current and lagged unemployment rates (along with State and year dummies). In the 1997 paper, specifications that include only a portmanteau dummy variable for “any statewide welfare waiver” imply that a waiver reduces a State’s caseload by roughly 5% (see Table 2, column 3). When dummies for specific policies are included instead, the estimates are rather imprecise. The only clearly significant policy is stricter work requirement sanctions, which are predicted to reduce the caseload by roughly 10%.

It should be stressed that a fairly small amount of data underlies these estimates. For instance, according to Crouse (1999), only five States implemented benefit time limits by early 1996, with two more implementing in the second half of 1996. Two States implemented work requirement time limits in 1994, four more in 1995 and two more in 1996. Stricter work requirement sanctions were more common. Six States implemented these prior to 1995, five more in 1995, and eight more in 1996. Thus, it was only in 1995-96 that a substantial number of States began implemented TANF-like policies.¹⁷

The CEA (1997) report notes that a one-year lead of the waiver dummy is significant. Their estimates imply that a waiver reduces the caseload by roughly 6% in the year *before* it is implemented. The report points out that this could be an anticipatory effect (e.g., the knowledge that welfare policies will become stricter may deter women from welfare participation even prior to waiver implementation). But another story is based on policy endogeneity. It is widely accepted that the increase in welfare caseloads in 1990-93, and the increase in program costs that this induced, helped create the political momentum that led to implementation of waivers and TANF.¹⁸ However, by the time that many States implemented waiver policies in 1995-96, and certainly by the time that most began to implement TANF policies in 1997, a rapid decrease in the caseload had already begun.¹⁹ Any mis-specified model that fails to capture the sharp declines in welfare caseloads

¹⁷ Schoeni and Blank (2000) use CPS data from 1977-1999, giving 3 years of post-TANF data. They also disaggregate State level caseloads by age and education groupings. They measure welfare reform using only waiver and TANF dummies, and attempt to control for all other factors using a large set of State and time effects (we discuss their specification further in Section 5.A). They obtain the puzzling result that TANF had no significant effect on work participation.

¹⁸ For instance, according to the 2000 Green book (U.S. House of Representatives 2000, p.352), “Frustration with the character, size and cost of AFDC rolls contributed to the decision by Congress to ‘end welfare as we know it’ in 1996. Enrollment had soared to an all time peak in 1994, covering 5 million families ... benefit costs peaked in fiscal year 1994 at \$22.8 billion,” and further “By early 1995, many Governors pressed for a cash welfare block grant to free them from AFDC rules. The concept of a fixed block grant ... was included in reform bills passed by Congress in 1995 and 1996; both were vetoed. But a third bill that included changes discussed during the 2 years of debate was enacted by Congress in July 1996 and was signed by President Clinton on August 22, 1996. By the time of TANF’s passage, AFDC enrollment had decreased to 4.4 million families.”

¹⁹ This can be seen quite dramatically in the State-by-State graphs of caseloads over time presented by Crouse (1999). By our count, there is clear visual evidence that caseloads had begun to fall substantially prior to any waiver or TANF implementation in at least 33 of the 50 States.

beginning in the vicinity of 1995 – prior to implementation of most TANF like policies – will tend to load these changes onto the TANF and waiver dummy variables. This is simply because the model will produce large serially correlated residuals in the post-1995 period, and any variable that “turns on” in that period will help “sop up” those residuals. Thus, what the CEA calls a “policy endogeneity” problem we prefer to call a misspecification or omitted variables problem.²⁰ The best way to deal with this problem is to look for additional control variables that can successfully explain caseload evolution in the pre-reform period. This is the approach we take here.²¹

It is interesting to note that in a model with State fixed effects our approach would not work. Consistency of OLS only requires that covariates and the errors be contemporaneously uncorrelated (i.e., that the policy variables be “predetermined”), while fixed effects estimators rely on “strict exogeneity” (lack of correlation at all leads and lags). Thus, policy endogeneity would lead to inconsistent estimates in fixed effects models even if the residuals were serially independent. This is a strong argument for not including State fixed effects if we believe that policy endogeneity is present.

The CEA models certainly fail to explain the increase on caseloads in 1990-1993 and the decline beginning in 1995. Unemployment rate changes over this period – the only non-welfare related explanatory factor in the CEA model – seem inadequate to explain the phenomenon, based on the prior history of insensitivity of caseloads to unemployment. CEA (1997) notes that “for the 1989-1993 period that saw a tremendous increase in the rate of welfare receipt ... changes in unemployment can only explain about 30 percent of the rise ... that leaves roughly 70 percent of the rise unexplained by this statistical analysis.” Their model also attributes 34% of the decline in caseloads in 1994-1996 to “other unidentified factors.” Thus, a key challenge is to develop a model that can better account for caseload movements over time, particularly the pre-TANF decline in caseloads beginning in 1995. Unless a model can fit this pattern, any effects that it attributes to waiver and TANF policies may be spurious.

²⁰ Even if policy is endogenous in the sense that increases in AFDC caseloads in 1990-1993 induced the implementation of waivers and TANF policies, this will not by itself bias the estimates of policy effects. It is only if residuals are serially correlated that one gets potential bias in the waiver and TANF coefficients. For instance, suppose there is an omitted variable that was driving up caseloads in 1990-93 and started to drive them down in 1995. The omission of this variable generates serially correlated residuals. If one could find this variable and include it in the model, thus eliminating serial correlation, the potential bias vanishes. The fact that the welfare policies were driven by caseload increases in the early 1990s would be irrelevant.

²¹ As CEA (1997) notes, another concern is that that caseload increases in the early 1990s varied by State. If those States that had the largest caseload increases were most likely to implement waivers, then the States with the largest residuals in the early 1990s would be the ones most likely to implement waivers in 1995 to 1996. If the residuals exhibit persistence, then waivers in 1995-1996 would be correlated with the 1995-1996 residuals as well, inducing bias. Again, this can be thought of as a misspecification or omitted variables bias, since, if one could control for the omitted factor driving caseloads – and inducing serially correlated residuals - then the bias would vanish.

Moffitt (1999) argues that the cyclical sensitivity of AFDC caseloads might have increased over time. Thus, unless one takes a stand on the cyclical sensitivity of the caseload, and how it has evolved over time, one cannot decide how much of the drop of welfare participation in the post-1994 period was due to welfare reform versus the strong macro economy. If one only had aggregate data, these would leave one with a hopeless identification problem. However, Moffitt also pointed out that that cross-State variation in unemployment rates can, in principle, be used to resolve this problem. One could ask if caseloads fell more or less in States where unemployment fell more or less, and one could even identify how the cyclical sensitivity of caseloads varied over time, provided one assumes that it varies in the same way across all States.

We are in a much stronger position vis-à-vis identification of macro economic effects than Blank (1997), CEA (1997, 1999), Moffitt (1999), Grogger (2000) or Schoeni and Blank (2000), because our analysis utilizes data from the recession of 2001-2002.

C. Studies of Non-TANF Related Reform Policies

Other important policy changes that may have influenced the welfare and work decisions of single mothers in recent years are expansions of Medicaid eligibility for low-income families not on AFDC, and expansion of the EITC. As discussed in Keane and Moffitt (1998), the fact that single mothers would tend to lose Medicaid eligibility if they left AFDC created an important work disincentive. But a series of Medicaid eligibility expansions in 1987-2002 may have reduced this disincentive, by allowing single mothers with income above the AFDC eligibility threshold to still receive Medicaid benefits. Often, eligibility for Medicaid expansions depended on the age of a woman's children.

Yelowitz (1995) attempted to quantify the effect of Medicaid expansions on work. He measured the extent of eligibility expansion by a single variable called GAIN% - the difference between the Medicaid income eligibility threshold under the expansion and the AFDC income eligibility threshold prior to the expansion. Identification of Medicaid expansion effects came from cross-State, over-time and across-woman variation in GAIN%. He used the March CPS from 1989-1992 to estimate a Probit model for work participation as a function of GAIN%. To control for other factors that might vary across States and time, he also included year and State dummies. Yelowitz' estimates imply that the Medicaid expansion of 1989-92 led to a 1.2 percentage point decrease in welfare participation and an 0.9 percentage point increase in labor force participation among single mothers with at least one child under 15. However, as we discussed earlier, for such a strategy to provide a consistent estimate of the effect of the policy variable in question, one has to make the strong and likely implausible assumption that all other time varying factors, including all omitted policy variables, impact all women in the same way

– regardless of the age composition of her children, or her State of residence. Furthermore, we must know a priori whether omitted time varying factors affect work participation of the “control” and “treatment” groups in level or percentage terms. Only then will the difference-in-difference methodology work.

Meyer and Rosenbaum (2001) is a more comprehensive study of the effects of a wide range of factors on work decisions of single mothers, but their focus is on the EITC. Their paper uses CPS data for 1984-1996, and incorporates changes in EITC and other tax rates, AFDC and Food Stamp benefit levels, welfare time limits (under waivers), Medicaid expansion and childcare and training expenditures. Relative to prior studies, Meyer and Rosenbaum represented a significant advance in terms of controlling for a wide range of factors. Their empirical specification, however, did not control for other key TANF-like reforms under waivers (such as work requirements). Moreover, their study used data only up to 1996, so they do not address the separate contributions of various components of the 1996 welfare reform to the subsequent drop in caseloads. Meyer and Rosenbaum’s estimates imply that EITC and other tax policy changes explained more than 60% of the increase in work among single mothers relative to single women without children in 1984-1996. Somewhat unexpectedly, their estimates imply that Medicaid expansions had a non-negligible and negative effect on work participation.

We conclude with two general observations about all the studies we have described. First, they all use only dummy variables to capture policy effects (e.g. whether or not a State had implemented a time limit). This is problematic because a policy like a time limit will most likely affect rates of entry and exit from welfare, rather than simply inducing an immediate level shift in participation. Then, such a policy will have an effect that gradually builds over time. In our analysis, we will explicitly construct measures of the time elapsed since particular policies might affect each single mother (based on her State of residence and demographics), thus allowing policy effects to develop gradually.

Second, all the studies we have described include State dummies to control for differences in welfare and work participation across States that are left unexplained by the various models. As we already mentioned, one reason for not using State fixed effects is that consistency of the fixed effect estimator requires a strict exogeneity assumption, which we do not believe regarding policy changes. Furthermore, Keane and Wolpin (2002a, b) show how the use of State fixed effects can lead to seriously biased estimates of policy effects in a dynamic model. For example, in a dynamic framework, a person decides whether to participate in welfare vs. work and invest in human capital today based not just on benefits today, but on expected future benefits as well. Suppose States have a typical level of benefit generosity that is persistent over time, but that fluctuates from year to year (e.g., Minnesota always has high benefits relative to Alabama, but the levels in each State

fluctuate from year-to-year). The transitory year-to-year fluctuations in benefits may have little effect on work and welfare participation decisions, which will be primarily driven by the permanent component of benefits. Hence, a State fixed effects estimator may lead one to underestimate the effect of benefits. Keane and Wolpin (2002a) show that this problem can be severe using simulations of a dynamic model.

For these reasons, we choose not to include State fixed effects in our models. Of course, this may create a problem if our control variables fail to explain the persistent level differences in welfare participation across States, generating serially correlated residuals by State. If States with persistently negative residuals for welfare participation tended to adopt certain policies under TANF, we may falsely infer that these policies reduced participation. As we show in Section 5, our models do a reasonably good job of explaining the persistent level differences in welfare participation and work across States, so we are not too concerned about this issue.

To summarize, we feel that prior studies of welfare reform suffer from a number of important limitations. Typically, they examine only a subset of the many policy and economic environment variables that we expect may impact welfare and work decisions. They often use State and time dummies to control for omitted time and State-varying factors. This procedure is only valid assuming that such omitted factors affect all demographic groups equivalently, and, even if this is true, that the analyst knows whether the equivalence holds in levels or percentages. On the other hand, prior studies that omit explicit year effects have not developed models that succeed in explaining the evolution of welfare participation over time at the national level (let alone broken down by State and demographic group).

3. Data

The data used in this paper combines individual level data from the March CPS (1981-2003) with a rich set of economic and policy variables. We now describe in detail how the data was constructed. In the process of describing the data, we also detail the sources of variation that we exploit to identify the effects of key economic and policy variables.

A. Individual Data

Our main data sources are the Current Population Surveys fielded between 1981 and 2003, covering activities in 1980-2002.²² The CPS is designed to provide a nationally representative sample by interviewing approximately 60,000 households. The sample size was increased in 2001 and 2002 to improve State estimates of children's health insurance coverage, for the purpose of allocating federal funds for the State Children's Health

²² Our CPS sample is extracted using the CPS Utilities produced by Unicon Research Corporation.

Insurance Program (S-CHIP) established in 1997. The CPS asks retrospective questions about demographics, work activities and income. The demographic variables, such as age, are asked relative to the week before the interview (“last week”); the income variables are asked with respect to last year; and the work activity variables, such as hours worked, major occupation, etc. are asked with respect to both the week before the interview (“last week) and last year.

Our unit of analysis is families headed by single mothers. Since we condition on single motherhood, we are taking marital status and children as exogenous. Of course, changes in welfare rules could affect marriage and fertility, but existing empirical work suggests these effects are small (see Moffitt 1992).

In constructing a data set on single mothers, it is important to note that the CPS is organized around households defined by a unique address, for example, a house or an apartment. A household may contain more than one family, with the person who rents or owns the house considered the head of the household. We select female-headed families or subfamilies as the unit of analysis.²³ We then count the number of dependents in each female-headed family or sub-family. Note that the dependent children are not necessarily the women’s biological children. Step or adopted children, grandchildren and other unrelated children who the women lists as dependents are also counted.

The CPS survey asks the respondent to provide detailed demographics (including age, race, education, marital status etc.) for every household member. We construct the “age composition of the women’s children” by counting the number of dependent children at each age. This is an important step because, as we discuss below, whether a woman is subject to particular welfare rules (such as work requirements) or eligible for particular benefits (such as childcare subsidies), often depends on the precise ages of her children.

We construct our welfare utilization measures from a family’s reported sources of income over the previous calendar year; and analyze work participation decisions based on the average hours worked last year. Specifically, we consider a single woman a welfare recipient if her income from public assistance (Unicon recode variable *incpa*) is positive.²⁴ The employment variables are directly provided by CPS, which includes the

²³ Specifically, a woman selected into our analysis will have to satisfy two conditions. First, they are heads of the primary family or a subfamily, which also means that they have dependent children. This is ensured by selecting the Unicon recode variable *_hhrel* to be equal to 1, 3, 5, 8, 10, 13, 15, 18, 20, 23, 26, 30, 32, 35, 38, 41, 43. Second, their marital status, given by the Unicon recode variable *_marstat*, is either 3 (separated), 4 (widowed), 5 (divorced) or 6 (never married).

²⁴ The exact question varies by year. But the essence of the question is “How much did... receive in public assistance or welfare in the previous year?” and it is coded as *incpa*. From 1988, the survey also asks about

“hours worked per week last year” (*hrslyr*). We recorded a woman as working full-time if she works for 32 hours or more per week, and part-time if she works between 8 and 32 hours per week.

B. Policy Data

B.1. Components of Welfare Reform

An important contribution of our paper is the comprehensive documentation of the many welfare policy changes that occurred at the State level over the 1980-2002 period. We collected detailed information about States policies from many sources, including the State Policy Documentation Project (SPDP), GAO (1997, 1998a), Gallagher et al (1998), Johnson, Llobrera and Zahradnik (2003), Hotz and Scholz (2002), the Department of Health Human Services (DHHS), the Office of Family Assistance, the Department of Agriculture (USDA), Center for Law and Social Policy, the Urban Institute, the Bureau of Labor Statistics (BLS), the National Governors’ Association (NGA), the Center on Budget and Policy Priorities (CBPP), the Green Book (various years), the Internal Revenue Service (IRS), and various State TANF policy handbooks. We now describe different policy components in detail.

I. Time Limits.

PRWORA prohibits States from using federal TANF funds to provide benefits to adults beyond a 60-month lifetime time limit (except that 20 percent of a State’s caseload can be exempted). Many States have opted to have shorter time limits, while other States have opted to use State funds to provide benefits beyond the 5-year limit. Furthermore, some States implemented time limits under waivers prior to PRWORA.²⁵

In order to understand the set of variables we use to capture possible effects of time limits, it is useful to examine the theory of how time limits can affect behavior. A key point is that time limits may have both “anticipatory” and direct effects. The direct effect arises simply from the fact that a person who reaches the time limit will be kicked off the program (assuming the limit is enforced). The anticipatory effect is subtler. The basic idea is that a forward-looking person faced with time limited welfare should try to conserve (or “bank”) her months of eligibility, and only use them when it is “really” necessary.

the number of months in which public assistance or welfare is received. Note that *incpa* will capture cash assistance but not in-kind assistance, such as food stamps.

²⁵ There is sometimes a distinction between when a State implemented its TANF plan and when it began counting months toward time limits. Arkansas, California, Ohio and Oregon started counting months toward time limits well after their initial TANF implementation dates. We use the *actual* counting date as the effective date for time limits in our analysis.

Consider a simple framework where a person decides each month whether to participate in welfare or work. A myopic person who maximizes current income would choose to participate in welfare so long as it generated one dollar more income than she could earn by working. But a forward-looking person would only choose welfare over work if the gap between benefits and earnings were substantial. Why use up a month of welfare eligibility just to make a few extra dollars? At some future point she may confront a situation where only very low paying jobs are available, so that welfare benefits far exceed her potential earnings. It would be best to conserve her months of welfare eligibility for such circumstances.

Stated more formally (see Appendix A), in a dynamic framework, the woman should make welfare participation decisions by comparing the value of current period welfare benefits to the value of current period potential earnings *plus* the “option value” of conserving a month of benefit eligibility. As Grogger and Michalopoulos (1999) point out, this option value is, *ceteris paribus*, an increasing function of the time horizon over which benefits may be used (i.e., the number of years until the woman’s youngest child reaches 18). It is also, *ceteris paribus*, a decreasing function of the stock of remaining months of eligibility (i.e., the option value of preserving a month of eligibility is greater when one has only one month left than when one has 60).

In our empirical models we use several variables to capture both the direct and anticipatory effects of time limits. These variables capture both time limits created under TANF and time limits created earlier under AFDC waivers. The variables are defined in Table 5. In this table, each variable has up to three subscripts: *i* for individual, *s* for State and *t* for year. Thus, the subscripts enable one to see whether each variable varies across States, people, or both.

At the most basic level, we include a dummy for whether a State had imposed a time limit (DTL_{st}), as well as a dummy for whether the time limit could be binding for a particular woman (DTL_HIT_{ist}). The later variable is person specific, because it accounts for the age of the woman’s children. A woman whose oldest child is A^o years old cannot have received welfare for more than A^o years. The time limit cannot bind for this woman unless A^o exceeds the limit, regardless how many years ago her State implemented time limits. Thus, when time limits may first bind varies across women in the same State.

Note that DTL_{st} captures an anticipatory effect of time limits, while DTL_HIT_{ist} captures a direct effect. We also include additional variables that allow the anticipatory and direct effects of time limits on welfare and work decisions to develop gradually over time. First, we construct a variable called “months elapsed since the implementation of time limits” ($MONTH_SINCE_TL_START_{st}$). Second, we construct a variable called “months

elapsed since the time limits could first potentially bind” for each single mother ($MONTH_SINCE_TL_HIT_{ist}$).

To evaluate the importance of the anticipatory effect of time limits, we construct two more variables motivated by the theory in Appendix A. First, the option value of “banking” welfare eligibility is increasing in the length of the time horizon over which a woman will be categorically eligible for benefits. This is the remaining time until her youngest child will reach age 18. We call this variable $REMAINING_CHILD_ELIG_{ist}$. Second, the option value of “banking” welfare eligibility is decreasing in the stock of eligible months that a woman currently possesses. We call this variable $REMAINING_TL_ELIG_{ist}$. To construct this measure, we first calculate the maximum number of months that a woman could have received welfare since her State started her “clock.” Subtracting this from the State time limit tells us the minimum stock of months that the woman possesses.

At this point, it is worth commenting on our overall strategy in constructing covariates. We assume that a woman’s demographics, the welfare policy rules she faces, and the economic environment in her State, are all exogenous. Thus, in order to maintain a true reduced form specification, every covariate we use as a determinant of welfare participation and work should be a function of these demographic, policy and economic environment variables. We can see the effect of this strategy quite clearly by looking at how we constructed covariates to measure effects of time limits. For instance, we do not want to use a woman’s actual welfare participation history to construct the remaining months on her time limit clock, because actual participation decisions are endogenous. Similarly, in the construction of $REMAINING_CHILD_ELIG_{ist}$, we ignore the fact that a woman can always extend her months of categorical eligibility by having another child. $REMAINING_CHILD_ELIG_{ist}$ is a function only of a woman’s current demographics and State policy variables, so it is certainly an exogenous variable driving current decisions.

A key point is that Michigan, New York and Vermont have chosen to use State funds to provide benefits to families beyond the 60-month Federal limit.²⁶ So these States do not have “real” time limits.²⁷ This is a key source of variation in the data that helps identify

²⁶ It is a common mistake in the literature, and some data sources as well, to assume that New York has a 60-month life time limit. According to New York State Comptroller’s Office, after the TANF time limit is reached, the State will provide Safety Net Assistance (SNA) to the family in the same amount as the family’s TANF grant. Twenty percent of the monthly payment standard is paid in cash for a personal needs allowance, and the rest is paid on a non-cash basis. Thus New York does not have a “real” time limit.

²⁷ As we discussed in Section 2.A, Oregon has a formal time limit, but it is also irrelevant because anyone who satisfies the work requirement does not have months count towards the time limit, and anyone who does not satisfy the work requirement has benefits terminated immediately. Very recently, Arizona and Massachusetts have revised their TANF plans to use State funds to provide benefits to families beyond the 60-month Federal limit. This change is too recent to be relevant for our empirical work.

the effect of time limits on welfare participation and work. To preview our finding that time limits have had small effects on welfare participation, we note that, in Michigan, the number of families on welfare dropped by 58% from August 1996 to June 2002, while the number of recipients dropped 62%. Over the same period, the number of families on welfare in New York dropped 63% while the number of recipients dropped 68%. These declines are close to the national average, suggesting that time limits are not the main factor underlying the dramatic drop in welfare participation since 1996.

Another important source of variation across States is the penalty that is imposed if a time limit is reached. Among States with “real” time limits, six (Arizona, California, Indiana, Maine, Maryland and Rhode Island) continued to provide the “child portion” of benefits to families even after the time limit is reached. As we discussed in Appendix A, this substantially reduces the impact of time limits. Thus, we constructed a measure for each State of how benefits are reduced when the time limit is reached.

II. Work Requirements and Exemptions.

Under PRWORA, States must require parents who receive TANF assistance to participate in “work activities” after a maximum of 24 months.²⁸ Many States have chosen to adopt shorter work requirement time limit clocks. States adopted their first TANF plans over the period from October 1996 through January 1998, and adopted revised TANF plans roughly 2 years later. Under the “first” wave of TANF plans, 20 States required participants to start participating in work activities immediately. Under the “second” TANF plans, 25 States required immediate work participation. Most States that do not impose an immediate work requirement have adhered to the 24-month maximum allowed under the federal law. The requirement that one participate in work activities in order to receive benefits may increase the disutility of welfare program participation, leading to reductions in welfare caseloads and increased work among single mothers.

PRWORA (Section 407, paragraph (b)(5)) gave States the option to exempt single parents with a child up to one year of age from work requirements. However, many States choose to only exempt single mothers with children under 3 or 6 months (e.g., California), while a few chose to grant longer exemptions. Thus, there is a considerable variation in the variable we call “length of child exemption from work requirements.” We use this variable, in conjunction with the State specific work requirement time limit and the age of the women’s youngest child, to construct an indicator for whether a woman could be subject to a work requirement. We call this variable SWR_{ist} .

²⁸ The definition of “work activities” in PRWORA includes “(1) unsubsidized employment; (2) subsidized private sector employment; (3) subsidized public sector employment; (4) work experience (including work associated with refurbishing of publicly assisted housing); (5) on-the-job training; (6) job search and job readiness assistance; (7) community service programs; (8) vocational educational training; and (12) the provision of child care services to an individual who is participating in a community service program.”

Thus, there are two key sources for the identification of the effects of work requirement time limits. First, due to the variation in when States implemented their TANF plans, and in the length of their work requirement time limit clocks, there is substantial variation across States in how early single mothers could have been subject to binding work requirements. For instance, under AFDC waivers, work requirements could have hit as early as mid-1994 in Iowa, October 1995 in Michigan, and mid-1996 in Wisconsin. TANF work requirements could bind as early as the Fall of 1996 in Alabama, Connecticut, Florida, Indiana, Kansas, Nebraska, New Hampshire, Oklahoma, Oregon, and Utah. But work requirements were not binding until December 1998 in New York, January 1999 in Louisiana, February 1999 in New Jersey, March 1999 in Pennsylvania and July 1999 in Illinois, Minnesota and Missouri.²⁹

Second, as we have noted, we can exploit individual level variation based on children's ages. For example, take two similar women who have each been on TANF for long enough that they have used up their State's work requirement time limit clock. Suppose each has a youngest child who is 9-months old. Suppose they live in two States with similar policies, except that one State exempts women with children under 12 months old and the other only exempts women with children 6 months old. Then only the woman in the latter State is exempt, so the difference in welfare participation and work behavior between these women provides additional evidence on the effects of work requirements. Similarly, take two similar women who each have an 18-month old child. Suppose they live in two States with similar policies, except that one State imposes an immediate work requirement while the other only imposes a work requirement after 24 months. The woman in the latter State cannot yet be subject to a work requirement. Since her youngest child is only 18 months old, she cannot yet have been on welfare for 24 months.³⁰

Besides the age of youngest child exemption, many States allow other exemptions from work requirements under TANF. These include exemptions for single parents with children under age 6 who are unable to obtain childcare, and for recipients who are disabled or have a disabled household member.³¹ We call the total number of these

²⁹ According to our calculations, the percentage of women who could have potentially been subject to a work requirement (i.e., SWR=1) was 5% in 1995, rose to 16% in 1996, 46% in 1997, 62% in 1998, 85% in 1999 and 91% in 2000. It then stabilizes at about 91% in 2001-2002.

³⁰ It is important to understand how the age of youngest child exemption interacts with the work requirement time limit clock. Say a State has a 24-month clock, and also has a 12-month age of youngest child exemption. If a woman is on welfare starting from the time the child is born, then when the child reaches 1 year old she will have just 1 year left on the clock.

³¹ States must maintain certain work participation rates among TANF recipients in order to avoid penalties to their TANF block grants. Originally, 25% of all families receiving assistance were required to participate in "work activities" for at least 20 hours per week. The required rate was gradually raised to 50% in 2002, while the hours requirement was raised to 25 hours in 1999 and 30 hours in 2000 onward. However, these

exemptions $N_WR_EXEMPTION_{st}$. States also differ in whether they impose a full or partial benefit sanction if a recipient does not satisfy the work requirement. A “partial” sanction generally means that only the adult portion of benefits is taken away while the children’s portion is not. In 1996, 9 States had a full sanction. The number of full sanction States increased to 23 in 1997, and stayed close to 30 from 1998 on. We code this dummy variable as $DFULLSANCTION_{st}$.³² We view both the sanction and exemption variables as indicators of the strictness with which a State enforces work requirement time limits, and we interact the work requirement variables with these measures of strictness.³³

Finally, it is important to note that work requirements can, in theory, have anticipatory affects just like time limits. If a State adopts a work requirement with a 24-month work trigger time limit, this creates an incentive to avoid welfare participation even before the 24 months is used up. One reason is to preserve time on the clock. Another reason is that, since expected future welfare participation is reduced, the value of human capital investment today is increased. Thus, we also include in our models a dummy for whether a State has a time limit in effect ($DWORKREQ_{st}$).

III. Benefit Reduction Rates and Earnings Disregards

The AFDC program always imposed a tax on earnings, called the benefit reduction rate (BRR). This tax was imposed after allowance for deductions for work and child care expenses. Over the history of the AFDC program, the amounts of these work expense deductions and benefit reduction rates were changed several times. Notably, the BRR was decreased from 100% to 67% in 1967, but was increased back to 100% in 1982. Starting in 1982 the work expense deduction was set at \$90 per month, and there was an additional childcare expense deduction.

In addition, in an effort to encourage work among participants, the AFDC program, at various times in its history, included “earnings disregards.” That is, if an AFDC recipient started a job, then, for a time, a part of her earnings (above and beyond the work and child care expense deductions) would not be subject to the BRR. In general, this “earnings disregard” might consist of a “flat” part (e.g., the first \$30 of monthly earnings) and a “percentage” part (e.g., one-third of earnings beyond that), but it would vanish after

requirements were relaxed for States that achieved substantial caseload reductions. Since caseloads fell so dramatically after 1996, States were rarely subject to significant participation rate requirements.

³² For first time violators of work requirements, States often have a more lenient sanction policy. While we do have information about the first time sanction rules, we will only use the “ultimate” sanction rule in our analysis. There is a high correlation between the first time and ultimate sanctions.

³³ Pavetti and Bloom (2001) classify 25 States as “strict” and 13 States as “lenient” in terms of the benefit losses on families of noncompliant individuals. Their classification is roughly consistent with our direct classification of “full” versus “partial” sanction States.

several months of work.³⁴ Starting in late 1992, in an effort to encourage work, many States used waivers to enhance their earnings disregards. PRWORA did not mandate particular disregard policies, so substantial heterogeneity has emerged in how States set disregards. Many States have expanded disregards and allowed them to apply indefinitely. For instance, under its TANF plan implemented in January 1998, California set the “flat” disregard at the first \$225 of monthly earnings, while setting the “percentage” disregard at 50% of additional monthly earnings, with no phase-out over time. Since the percentage part of the disregard is not phased out, it is just like a BRR of 50%, and this is in fact how we code it. Across States, as of 2002, flat disregard amounts varied from \$0 to \$252, while percentage disregards varied from 0% to 100%.

Obviously, earnings disregards, the BRR and work expense deductions affect a woman’s incentive to work directly, by shifting her after-tax wage rate. A lower effective tax rate makes welfare receipt more attractive. Furthermore, as we discuss in Appendix A, under time limits effective tax rates also affect the incentive to bank months of eligibility. The higher the effective tax rate, the greater the incentive to forego participating in welfare in a month when a woman can find work.

IV. Diversion Programs

Under TANF, many States have developed “diversion” programs under which new TANF applicants can receive a few months worth of benefits up front if they agree to not participate in TANF for some period of time. A typical program may offer 3 months of benefits up front to a person who agrees to stay off “welfare” for 3 months. We view this as largely an accounting device to make TANF caseloads appear smaller, so we code diversion payment recipients as welfare recipients. Eight States have introduced what we would call “genuine” diversion programs whereby TANF applicants agree to stay off welfare for extended periods in return for short-term cash payments (or loans) whose value is well below the maximum value of the forgone benefits.³⁵ In our empirical analysis, we simply introduce a dummy variable to indicate whether the woman lives in a State with a “genuine” diversion program.

V. Child Support Enforcement and Treatment of Child Support Income

Child support is an important source of income for single women with dependent children (see Table 4a), despite the widespread non-payment of child support. Under AFDC recipients were required to assign child support collections to the welfare agency. States

³⁴ After 1982, the rule was as follows: For each of the first four months of work, the first \$30 of earned income, plus one-third of the remainder, was disregarded when calculating the monthly benefit. After four months and until one year, only the \$30 monthly “flat” disregard continued. After one year, there was no earnings disregard. This means that after one year, a recipient’s grant amount was reduced by one dollar for every dollar she earned above the \$90 work expense deduction.

³⁵ These eight States are: Arkansas, Florida, Kentucky, Idaho, Montana, Texas, Washington and Wisconsin.

were then required to “pass-through” the first \$50 of monthly child support payments to the family. This pass-through income was disregarded for purposes of benefit calculation. Between January 1993 and August 1996, States requested and received waivers of a number of AFDC provisions related to child support enforcement. These waivers sometimes involved changing the pass-through amount, or allowing single mothers to keep child support payments, in which case they would be subject to certain disregards just like earned income. Under TANF, all States have discretion to set their own policy in terms of pass-through or disregard of child support payments.

The Child Support Enforcement (CSE) program was enacted in 1975 to address the problem of non-payment of child support owed by non-custodial parents. CSE has programs to help locate absent parents and establish paternity. The CSE administrative expenditure is an important indication of how likely it is that a single woman will be able to collect child support. Figure 4 shows the large increase in CSE expenditures from \$2.9 billion in 1996 to \$5.1 billion in 2002, a 76% jump. As a measure of State level CSE activity, we take State level CSE expenditures and divide it by the State population of single mothers (excluding widows). Note that CSE expenditure should not impact the work/welfare decisions of widows (simply because widows do not have ex-husbands from whom to collect alimony or child support). This, combined with cross-State and over-time variation in CSE spending, provide the three key sources of variation that identify the effect of child support enforcement expenditures on welfare participation and work.

In terms of the incentives created, there are important interactions between the CSE expenditures and the pass-through/disregard rules. Since child support payments are heavily taxed under TANF rules in many States, enhanced child support collections provide an incentive to avoid welfare. On the other hand, enhanced pass-throughs or disregards may reduce this incentive.

VI. Child Care Subsidies and the Child Care and Development Fund (CCDF)

In the late 1980s, several programs were created that expanded Federal support for childcare. The Family Support Act (FSA) of 1988 created two programs, AFDC Child Care and Transitional Child Care (TCC). AFDC Child Care was designed as an entitlement for single parents on AFDC who were working or enrolled in job training or education programs. TCC provided a temporary child care subsidy to single parents with young children for 12 months after they left AFDC to start working. Both programs used AFDC participation as an eligibility criterion. The Omnibus Budget Reconciliation Act (OBRA) of 1990 created the Child Care and Development Block Grant (CCDBG) and the At-Risk Child Care program. These programs gave States funds to subsidize childcare for low-income working families who were not on AFDC. However, unlike AFDC Child Care and TCC, these benefits were not an entitlement. PRWORA consolidated these four

pre-existing programs into the Child Care and Development Fund (CCDF). The CCDF provides federal funds to the States that they can use to provide childcare subsidies to low-income working families, whether or not these families are current or former TANF recipients. Under the CCDF, a great deal of heterogeneity has emerged across States in the design of their childcare subsidy programs. In particular, it should be noted that benefits are rationed in many States, and States differ in terms of whether they give priority to low-income families who are on TANF or just transitioning off TANF.

We use the State CCDF expenditure per single mother as a measure of the availability and generosity of childcare subsidies in a State. A key factor identifying the effect of childcare subsidies is that they are essentially irrelevant for women whose children are older than 12, since they are not eligible for subsidies except in rare instances (i.e., special needs children). Also, the effect of childcare subsidies is presumably stronger for women whose children are below school age.

As we discuss in Appendix B, an important aspect of PRWORA is the MOE requirement, which requires States to maintain at least 75% of their pre-1996 spending levels on assistance for needy families in order to receive the full TANF block grant. The MOE interacts with the CCDF in an important way. The CCDF funding system is rather complex, as it consists of federal funds to which States are entitled, plus federal matching funds that require State contributions, plus discretionary State contributions, including a certain level of funds they are allowed to transfer out of the TANF block grant. But the key point is that the State part of CCDF spending counts as MOE spending. Thus, when welfare caseloads began to drop unexpectedly rapidly after 1996, causing State spending on TANF cash assistance to drop, the States shifted substantial resources into the CCDF, as one way to achieve the MOE requirement. This dynamic was partly responsible for the rapid growth in total expenditures on CCDF from 1996 to 2002 (see Figure 4).

An alternative to our use of CCDF expenditures per single mother as a measure of the generosity of a State's childcare program would be to use detailed program parameters, such as the monthly income limit for eligibility and the co-payment rate, which are State specific and have also varied over time within States. We choose not to use this approach because of the problems created by rationing. A State with a seemingly generous program – i.e., a high income eligibility threshold and a low co-payment – will tend to have a longer waiting list. Thus, program generosity is more accurately measured by the States' actual per-case expenditure than by the income eligibility threshold and co-payment rates.

B.2 Contemporaneous Policy Changes

I. Earned Income Tax Credit (EITC).

The Earned Income Tax Credit (EITC), enacted in 1975, is a refundable Federal income tax credit that supplements wages for low-income working families. Major expansions of the federal EITC occurred in 1986, 1991, 1994 and 1996. Because of these expansions, the number of families receiving EITC increased from 6.2 million in 1975 to 19.5 million in 2000, and total EITC payments increased from \$1.25 billion to more than \$31 billion (see Figure 3 and U.S. House of Representatives Green Book 2000, page 813).

The EITC rules specify four parameters, a “phase-in” and “phase-out” rate, and a “phase-in” and “phase-out” income range. These parameters depend on family size. After the expansions of the mid-1990s, the EITC became a sizable wage subsidy to low and moderate-income families. Thus, it may provide an important work incentive. For example, in 2003, the phase-in and phase-out rates for a family with one child are 34% and 15.98%, respectively. The phase-in income range is \$0-7,490, and the phase-out income range is \$13,730-\$29,666. Thus, a single mother with one child with a taxable income between \$7,490 and \$13,730 would receive an EITC of \$2,547. The EITC phase-in rate is even higher (40% in 2003) for families with two or more children.

As of 2003, seventeen States have enacted State earned income tax credits that supplement the federal credit. Most State EITC programs were enacted in 1990s. We collect State EITC information from Johnson, Llobrera and Zahradnik (2003), Hotz and Scholz (2002) and from State web sites.

In our econometric analysis, we combine Federal and State EITC programs, and characterize them by two parameters: the phase-in rate and the maximum credit amount. There are many sources of variation that help identify the effects of EITC. First, there is the across-time variation. For example, the Federal EITC phase-in rate for families with one child increased from 10% in 1980-1984 to 14% in 1987-1990, to 16.7% in 1991, 17.6% in 1992, 18.5% in 1993, 26.3% in 1994 and stayed at 34% from 1995 onward. Second, since 1991, the EITC phase-in rate and maximum credit have differed for families with one vs. two or more children, thus introducing across-individual variation. Third, there is the across-State variation since State EITC programs were introduced at different times and with different parameters.

II. Food Stamps.

The Food Stamp program provides coupons that can be exchanged for food at participating stores. The value of the coupons to which a family is entitled, depends on a grant level, which depends on family size, and a benefit reduction rate that is applied to income. Unlike AFDC/TANF, Food Stamp benefit levels are set at the federal level and the rules apply for all States except for Alaska and Hawaii. We collect the food stamp

program parameters directly from U.S. Department of Agriculture. Currently, the Food Stamp benefit reduction rate is 30%.

III. Medicaid and S-CHIP

AFDC/TANF participants have had health insurance coverage provided by Medicaid since the inception of the Medicaid program in 1965. Since 1987, there have been a number of expansions of Medicaid eligibility that enable single mothers to leave AFDC/TANF while, under various circumstances, still maintaining Medicaid coverage. Between 1987 and 1990, several legislative options and mandates were enacted to expand Medicaid eligibility for pregnant women, infants, and children. OBRA 1989 required States to cover all pregnant women, as well as children below age six, living in families with income at or below 133 percent of the federal poverty line (FPL). OBRA 1990 required States to phase in coverage of children living in families with income below the FPL who were born after September 30, 1983, until all children through age eighteen were covered. As of October 1, 1997, children fourteen years of age and younger were covered in all States, and the upper age limit of eighteen was reached in all States in October 2002.

The States Children's Health Insurance Program (S-CHIP) of the Balanced Budget Act of 1997 provided States with access to roughly \$24 billion in federal grants over five years to provide health insurance to uninsured children under age 19 in families with incomes below 200 percent of the federal poverty line. S-CHIP covers approximately 5.3 million children nationwide. States are using this new grant money to expand Medicaid, or to develop new programs or expand existing programs that provide health insurance, or a combination of both approaches.

We collected Medicaid and S-CHIP rules for each State since 1987 from the annual Maternal and Child Health (MCH) updates of the National Governors' Association.³⁶ These updates provide detailed information on the age limits of children covered by Medicaid (independent of welfare status), and the age-specific income eligibility thresholds (as a percentage of the poverty line). We combine these rules with the children's age composition of each single mother to obtain a variable *MEDICAID_PCT_{ist}* that measures the percentage of children who would be covered by Medicaid if the woman leaves welfare but earns below the income threshold of Medicaid eligibility, which is coded by the variable *MEDICAID_FPL_{ist}*. Since the income threshold for Medicaid eligibility varies by the age of the child, we used the threshold applicable to the woman's youngest eligible child as a percentage of the Federal poverty line (FPL) in constructing *MEDICAID_FPL_{ist}*.

³⁶ The MCU updates from 1990 to 2002 can be found at <http://www.nga.org>.

B.3 Macro Economic Variables

We include several variables in our model to control for State and national economic conditions. These are: 1) State level unemployment rates, which we obtain from the Bureau of Labor Statistics; 2) the federal income tax, which we characterize by the personal and standard deduction amounts (deflated by the CPI) and the lowest bracket federal income tax rate, obtained from the Urban Institute website; 3) the minimum wage rate, which we collect from the Department of Labor website; and 4) the 20 percentile wage rate for each State (deflated by CPI), which we construct from the CPS.

4. Descriptive Statistics

Our data set contains 127,119 observations on single mothers 18 years and older over the 1980-2002 period. In this section we provide descriptive statistics about the single mother population and their welfare/work participation behavior over that period.

A. Demographics: Race, Marital Status, Family Size and Educational Attainment.

[Table 2 About Here]

Table 2 summarizes basic demographic information about single mothers. As we see in Table 2a, the racial composition of single mothers has been very stable over time, with about 62 to 65 percent white, and 32 to 35 percent black. On the other hand, there has been a dramatic and steady increase in the proportion of never married single mothers from 15.6% in 1980 to 41.3% in 2002. In fact, in 1997 “never married” overtook “divorced” as the most common marital status among single mothers. The fact that the proportion of never married single mothers increased after 1996 is interesting, as an explicit objective of PRWORA was to lower the incidence of out-of-wedlock births.

Table 2a also shows that there is a slow downward trend in the size of single mother headed families. The proportion of single mothers with only one child increased from 48% in 1980 to 54.5% in 2002. The percentage of single mothers with four or more children decreased from 7.7% in 1980 to 4.7% in 2002. On average, single mothers have about 1.7-1.8 children.

Table 2b summarizes single mothers’ educational attainment. The percent of single mothers who are high school drop outs declined from 34.5% in 1980 to 19.3% in 2002. At the same time, the percent of single mothers with at least some college increased from

26% to 45%. However, the bulk of this rather substantial increase in educational attainment occurred prior to 1996.

An important message of Table 2 is that shifts in the demographics of single mothers since 1996 have been rather gradual. The largest shift over this period was the increase in never married single mothers, and this shift is not favorable regarding work. Thus, demographic shifts alone will be unable to account for much of the drop in welfare caseloads since 1996.

B. Welfare Participation Rates Among Single Mothers.

The solid lines in Figures 5-12 describe the actual evolution of welfare and work participation rates for single mothers from 1980 to 2002, both overall and broken down by State and demographic group.³⁷ The top panel of Figure 5 shows the overall welfare participation rate. In contrast to the trend in *total* AFDC/TANF caseloads (see Figure 1), the participation *rate* is much more stable before 1994. It hovers around 30% from 1980-94, with a peak of 32.15% in 1993. Since 1993, however, welfare participation has dropped spectacularly, all the way to 9.07% in 2002 - a drop of 23.12 percentage points or 72%!³⁸

Figure 6 reports welfare participation rates for eight large States. Clearly, both levels and trends in participation rates differ substantially by State. In California, the participation rate peaked in 1993, while in Texas and Florida it peaked in 1992, all roughly consistent with the national trend. But in Michigan the participation rate has trended down since 1983, and in Illinois it has trended down since 1987. The peak year in Pennsylvania was 1984, but it had a second run up that peaked in 1992. Peak years in New York and North Carolina were 1990 and 1991, respectively – a bit earlier than the national peak.

Figures 8-12 show how welfare participation rates of single mothers vary with their demographic characteristics. Of course, it is not surprising that welfare participation rates differ by demographics. What is more interesting is that trends in participation rates over time also differ in important ways across demographic groups. For instance, the left panel of Figure 8 shows, not surprisingly, that welfare participation rates differ substantially by educational attainment. In 1994, the participation rate was 47.7% among single mothers who were high school dropouts, 30.3% among high school graduates, 25.1% among those with some college, and 7.1% among those with a college degree. More interestingly, the

³⁷ Recall that we define “welfare participation” as receipt of cash public assistance.

³⁸ Since the March CPS is repeated cross-section data (with only a small panel component), we cannot determine the extent to which the decrease in welfare participation is due to an increase in exit from or a decrease in entry into welfare. Grogger, Haider and Klerman (2003) used Survey of Income and Program Participation (SIPP) data to examine the importance of entry in explaining the welfare caseloads drop.

participation rate declines since 1994 for these four groups were 62%, 71%, 70% and 80%. Thus, participation has dropped less for the less educated mothers.

The left panel of Figure 9 shows that welfare participation rates of single mothers differ substantially by previous marital status. The participation rate of the never married mothers has historically been the highest (44.1% in 1994), followed by separated (33.7% in 1994), then divorced (18.8% in 1994), and finally widowed (12.3% in 1994). Interestingly, the percentage drops since 1994 for these four groups were 71%, 67%, 74% and 52%, respectively. Due to their relatively large participation rate drop, the divorced group now has the lowest participation rate.

As we see in Figure 10 (left panel), welfare participation rates for black women have historically been much higher than for white women. However, while the participation rate for whites was fairly stable at roughly 25% from 1980 to 1994, the rate for blacks fell from 42.6% to 37.0% over the same period. Thus, in 1994, the participation rate for blacks was 47% greater than for whites. Since the welfare reform of 1996, racial differences in participation rates have narrowed further. In 2002, the participation rates for whites and blacks were 8% and 10.5%, respectively, so the rate for blacks was only 31% greater. Thus, the decline in welfare participation rates has been much greater for blacks than for whites, and the downtrend for blacks started much earlier.

The left panel of Figure 11 shows that participation rates are much higher for single mothers with younger children, a point we discussed in Section 2.A. Interestingly, the drop in participation from 1994 to 2002 is larger for mothers whose youngest child is 6 (76%) than for those whose youngest child is less than 1 (62%), or those whose youngest child is 13 (47%). The pure anticipatory time limit effect story implies a monotonically decreasing rate of decline as age of youngest child increases, *ceteris paribus*. Thus, these figures seem somewhat inconsistent with that story.

Finally, the left panel of Figure 12 shows that single mothers with more children are more likely to be on welfare. The percentage drop in welfare participation from 1994-2002 was similar for women with 1, 2, 3 or 4+ children (69%, 71%, 65% and 66% respectively).

C. Work Participation Rates Among Single Mothers.

Next, we summarize the evolution of work participation rates for single mothers from 1980 to 2002. Recall that we define “full-time” work as working more than 32 hours per week, “part-time” as 8 to 32 hours, and “not working” as less than 8 hours per week. In this section we combine part-time and full-time work into a single “working” category. The general patterns we describe here are robust to plausible changes in these definitions.

The bottom panel of Figure 5 shows that the percentage of single mothers who work increased from 67.8% in 1993 to 82.0% in 2000. With the onset of the recession, the percent working slipped back down to 79.1% in 2002. Regarding the timing of the recent dramatic drop in welfare participation and increase in work, it is interesting that the upward trend in work began a year earlier. That is, welfare participation rose rather noticeably in 1993, while work increased slightly in 1993. It is plausible that this occurred because substantial enhancement of work incentives via expansion of EITC occurred in 1993, while introduction of regulations making AFDC less attractive, such as work requirements under waivers, did not start to become common until 1994. Both the percent not working and the percent on welfare start to trend down strongly together in 1994. Not shown in Figure 5 but also notable is that almost all the increase in work activity took the form of increased full time work. The percentage of single mothers working full time increased from 53.3% in 1993 to 67.3% in 2000, while the percentage working part time stayed fairly flat (in the 14% to 15% range).

Figure 7 reports work participation rates for eight large States. Clearly, both levels and trends in work differ substantially by State. In California, work is rather stable except for a dramatic increase in 1996-2000. In contrast, in Michigan work trended up over the whole 1980-2002 period. Florida, Pennsylvania and North Carolina show clear cyclical patterns, while the employment rate is rather flat in Texas throughout our sample period. New York shows a slight upward trend in the mid-1990s followed by a sharp increase in 1998-2000. Illinois has an upward trend from 1980 through 1999, followed by a decline.

Figures 8-12 show how work participation rates of single mothers vary with their demographic characteristics. The right panel of Figure 8 shows, not surprisingly, that work is much more prevalent among the more educated. Since 1993, the percentage not working has declined at all education levels. For women with less than high school, high school, some college or college educations, the declines in percent “not working” were 28%, 31%, 35% and 29%, respectively.³⁹

However, the trends in work participation differ in important ways across certain demographic groups. For instance, Figure 9 (right panel) shows single mothers’ work participation rates conditional on marital status. Divorced single mothers are the most likely to work, and widowed single mothers are the least likely to work. In 1993, the percentage working among widowed, never married, separated and divorced single mothers were 49.4%, 58.9%, 65.8% and 80.0% respectively. In 2002, these percentages

³⁹ We prefer to report percentage declines in the percent not working, rather than percentage increases in the percent working, because the former can always range from 0 to 100% regardless of the baseline. Thus, the percentage decrease in the percent not working should be more comparable across groups with different baseline rates of work participation.

had risen to 56.2%, 75.9%, 78.2% and 86.8%, respectively. Thus, the decrease in the percent “not working” is greater for never married single mothers (41%) than for the other groups. It is interesting that the never married and separated groups show slight upward trends in “work” in the pre-1993 period, while the divorced and widowed groups do not.

As we see in Figure 10 (right panel), work participation rates for white women have historically been higher than for black women. Similar to the patterns we saw for welfare participation, the work participation rate for whites held stable at roughly 72% from 1980 to 1994, while that for blacks rose from 57% to 65% over the same period. Since the welfare reform of 1996, racial differences in work participation have narrowed further. In 2002, the work participation rates for whites and blacks were 81% and 76% respectively, so the rate for whites was only 5 percentage points (or 6.6%) greater.

The right panel of Figure 11 summarizes single mothers’ work participation rates conditional on age of their youngest child. In 1993, the percent of single mothers with infant children who worked was only 46.4%. By 2000, this rate increased to 76.7%, but with the recession it dropped back down to 68.2% in 2002. The fraction of single mothers with 6-year old children who worked was 73.0% in 1993, and the fraction working was slightly larger among those with older children. The overall decrease in “not working” from 1993 to 2002 was 41% among women with infant children, 35% for those with 6-year old children, and 36% for those with 13-year old children. Meanwhile, the percent of women with 17-year old children who work stayed fairly flat at about 75%.

The right panel of Figure 12 shows that work participation rates tend to be lower for women with more children. More interestingly, the increase in work from 1993 to 2002 was much greater for those with two or more children than those with only one child. The percent of mothers with one child who do not work declined from 25.8% in 1993 to 20.0% in 2002, which is only a 22% decrease. But among those with two children, the percent not working fell from 32.0% to 18.7%, a 42% drop. For women with more children the percentage decreases were slightly larger.

One plausible explanation for this pattern is that it is due to the EITC, since the EITC phase-in rate for women with one child only increased by 5.8 percentage points from 1993 to 2002, while that for women with 2 or more children increased by 13 percentage points. Of course, it is also possible that day care and/or Medicaid expansions were more important for women with more children, or that work requirements had a greater effect on women with more children.

In general, the key fact that our discussions in Section 4.B and 4.C bring home is that there are important differences across States and demographic groups in how work and

welfare participation have changed over-time. A successful model should explain changes in work and welfare participation among single mothers not just at the national level, but also at the State level, and at the level of particular demographic groups. We will allow for interactions of our policy measures with the key demographics discussed here (i.e., education, prior marital status, race, age, age of children, number of children) in order to accommodate the fact that different policies may differentially affect different groups.

D. Differences in Welfare and Work Participation Rate Changes.

As we noted above, the overall welfare participation rate dropped from 32.15% in 1993 to 9.07% in 2002, a 23.1 percentage point decrease. At the same time, the work participation rate increased from 67.8% to 79.1%, an 11.3 percentage point increase. It is notable that there is a 11.8-percentage point gap between the drop in welfare and increase in work. What explains this discrepancy?

[Table 3 About Here]

One factor is that that work and welfare are not mutually exclusive. If a single mother who worked while on welfare leaves welfare (and continues to work), then welfare participation falls but work participation does not increase. On the other hand, women may leave welfare without finding work. In Table 3, we decompose the discrepancy between the changes in the welfare and work participation rates into these two components. First, the fraction of single mothers who both work and receive welfare dropped from 11.3% in 1993 to 4.5% in 2002, a decrease of 6.8 percentage points. Second, the fraction of single mothers who neither work nor collect welfare increased from 11.4% in 1993 to 16.4% in 2002, an increase of 5 percentage points. Together, these components exactly account for the 11.8 percentage point gap between the increase in work and decrease in welfare participation. The fact that the percent of single mothers who neither work nor receive welfare increased by 5 percentage points is troublesome, since this may be a vulnerable group. We return to this point in the next section.

E. Single Mothers' Income and Other Life Quality Measures.

In this section we examine the well being of single mothers. Table 4 summarizes the evolution of their income and other life quality measures over the 1980-2002 period. The measures we examine include housing arrangements, number of hours worked per week, and average hourly wages.

[Table 4 About Here]

Table 4a summarizes single mothers' average real incomes (in 2001 constant dollars) and their main sources of income. From 1980 through 1993 the mean real income of single

mothers was basically flat, except for a brief decline in 1981-1983. However, from 1993 to 2002, mean real income increased from \$18,498 to \$23,068, an increase of \$4,569, or 25%. Their mean real earnings increased by \$5,161, or 39.5%, over the same period. Much less important sources of income that showed some gain in this period were child support and alimony, perhaps reflecting the increases in States' expenditure on child support enforcement. At the same time, mean income from public assistance and food stamps dropped substantially, from \$2450 in 1993 to \$800 in 2002.

The source of the real earnings increase can be decomposed into parts due to the increased work participation rate, increases in average hours worked per week (conditional on employment), and increases in real hourly wages. Recall that the work participation rate of single mothers increased from 67.8% in 1993 to 79.1% in 2002, a 16.7% increase. According to Table 4b, the mean hourly wage rate increased from \$11.16 to \$12.88, a 15.4% increase.⁴⁰ Average hours per week increased from 37.64 to 38.27, a 1.7% increase. Thus, the hourly wage increase together with the work participation rate increase explains almost all the 39.5% increase in real earnings experienced by single mothers in this period. The last column in Table 4a shows the average (simulated) value of federal and State EITC payments. The CPS imputes these EITC payments, so we do not include them in the total real income measures. Note that from 1993 to 2002, the average real EITC more than doubled.

Table 4b shows that the percent of single mothers living in public housing declined from 11.4% in 1993 to 9.4% in 2002. Somewhat surprisingly, the rate of cohabitation only increased slightly, from 30.5% in 1993 to 31.9% in 2002.⁴¹ In Section 4.D, we showed that there was 5-percentage point increase in single mothers who do not work and are not on welfare. In future work we plan to investigate more carefully the income sources of these women. Preliminary results suggests that they are more likely to reside in public housing and cohabit with others, that they tend to have above average levels of Social Security and Supplemental Security Income, but that they still have income levels well below average for single mothers.

5. The Empirical Specification

A. Demographics and Identification

We summarize the variables used in our empirical analysis in Table 5. The individual level demographic variables (DEM) that we include in our model are age, which is continuous, along with several categorical variables: race (3 categories), educational

⁴⁰ To obtain an hourly wage measure for each woman, we divide total wage income (*incwage*) by total hours worked, which is the product of *hrslyr* and total weeks worked last year (*wkslyr*).

⁴¹ We say a single mother cohabits if she lives in a house or apartment where another person pays the rent.

attainment (4 categories), marital status (4 categories), State of residence (51 categories), and urban/rural residence (2 categories). We also summarize the single mother's family composition by five variables: numbers of children in age groups 0-5, 6-12 and 13 and above, as well as the age of youngest and oldest child.

[Table 5 About Here]

A completely saturated model would include a separate dummy variable for each demographic group in each State in each time period. As six of our demographic variables are continuous, the number of demographic "groups" is enormous. However, for the purpose of understanding identification, it is useful to think of a simpler situation in which the data on age and number of children are discretized. Suppose that all we observe in the data is whether the woman is in one of 4 age categories, her youngest child is in each of 3 age intervals, whether her oldest child is in each of 3 age intervals, and whether she has 1, 2 or 3+ children. We would then have $4 \times 3 \times 3 \times 3 = 108$ categories of family in terms of age composition. In addition, we have $3 \times 4 \times 4 \times 2 = 96$ types of mothers in terms of race, education, prior marital status and urban/rural residence, giving $108 \times 96 = 10,368$ demographic cells. A fully saturated model that interacted demographics*State*time would then include $10,368 \times 51 \times 23 = 12,161,664$ parameters, and would fit the data on welfare participation and work (by cell) perfectly.

Of course, a fully saturated model does not permit identification of policy effects. Since the model fits the data perfectly using demographic×State×time dummies, it is impossible to identify the effect of any *particular* time varying factor, like a policy variable.⁴² If we wish to identify a policy effect, we must exclude certain interactions. The source of identification depends on which interactions are allowed, and which are excluded.

As we discussed in Section 2, much of the prior literature in this area has relied on specifications that include State dummies, year dummies, and State specific quadratic time trends. This gives a model with $51+23+100 = 174$ parameters. A typical procedure is then to include a measure of a *single* policy, such as a time varying dummy variable for whether a State has yet imposed time limits.

It is important to understand the assumptions that underlie identification in such a specification. One is assuming that any omitted time varying factors, including other policy variables (besides the particular policy one includes), either have common effects

⁴² Note that the lack of identification has nothing to do with the fact that the number of parameters in a saturated model would exceed the number of available data points (127,119 in our case). This is a finite sample problem, while identification analysis proceeds under the hypothetical that one has unlimited data. Rather, the lack of identification comes from the fact that, if the model is saturated, then all time varying factors are controlled for.

across all States (picked up by the year dummies), or else, if they do have differential effects by State, that these are captured by the smoothly varying State specific quadratic time trends. These assumptions would both be violated by an omitted policy variable that turned on discretely in a particular year (say 1993) and that had differential effects across States (say because it affects different demographic groups differently and the demographic composition of States differs).⁴³

To avoid these problems, one could use a more flexible specification that included State×year interactions (i.e., State specific time dummies rather than State specific time trends). This specification would have $51 \times 23 = 1173$ parameters, plus the additional parameters characterizing the single policy under study. In that case, identification of the policy effects relies on how the policy differentially affects different demographic groups within a State over time. The key assumption is that any omitted policy variables have common effects across all demographic groups. We argued at length in Section 2 that this assumption is implausible.

One could try to deal with this problem by including demographic×time interactions. As we have 10,368 demographic cells, this would generate $10,368 \times 23 = 238,464$ parameters, although, perhaps, one could reduce this by defining groups much more coarsely. Even here though, one is continuing to assume that any omitted policies that affect different demographic groups differently are national policies. That is, they cannot be implemented at different times in different States. This is obviously false in the case of welfare reform. But relaxing this assumption brings one back to the saturated specification.⁴⁴

Given that, over the 1980-2002 period, States have pursued an array of different policies that clearly have different effects on different demographic groups, and that these policies

⁴³ They would also be violated by State specific policy variables that turn on discretely at particular points of time (so long as timing differs across States or, if timing is synchronized, effects differ across States).

⁴⁴ Schoeni and Blank (2000) adopt a hybrid approach by including some demographic×time interactions and State specific time trends. Rather than use individual data, they use March CPS data from 1977-99 to calculate welfare participation rates by State and year for each of 3 education and 4 age categories, giving $23 \times 3 \times 4 \times 51 = 14,076$ cells to be fit. Their model includes 234 parameters, since it includes State dummies (50), dummies for age, education and race (9), State specific time trends (50), aggregate time dummies (23), aggregate time dummies interacted with education (69), and interactions of the 3 education group dummies with: current and lagged unemployment and employment growth rates, the AFDC grant for a family of 3, and 4 age dummies (27). They then include just 6 parameters to capture effects of welfare reform. These are dummies for whether a State had a waiver or had implemented TANF, both of which are interacted with the 3 education categories. This model is identified because it assumes any omitted policies that affect different education groups differently are purely national (rather than State specific), and because it rules out omitted variables that affect different age groups differently. We view such assumptions as untenable, given the great heterogeneity of policies across States, and because many policies would potentially effect women of different ages differently. For example, older mothers are likely to have higher wages, so they may be more affected by EITC, and they will tend to have older children, so we expect them to be less affected by CCDF, time limits, and work requirements.

were implemented at different times in different States, we feel it is not possible, under reasonable identifying assumptions, to identify the effect of any single policy (or small set of policies) while using an array of State and time dummies to control for all other aspects of policy. Thus, in this paper, we take a very different course. That is, we have attempted, as best as possible, to include in our model measures of the entire range of policy changes that occurred at the State level over the whole 1980-2002 period. We also interact these policy variables with a range of demographic controls to allow for the fact that policies differentially affect different groups.

Thus, in estimating the effect of any particular policy, we are in effect controlling for other time-varying factors not through dummies, but rather by including those other policy and economic environment factors explicitly in the model (and allowing for policy×demographic interactions that allow those other factors to differentially affect different groups). In our approach, the key identifying assumption is that we have adequately controlled for all the important time varying factors that influence welfare participation and work decisions of single mothers over the 1980-2002 period. Of course, this is a very strong assumption, but it should at least in principle be achievable. (If not by us, then at least by others who can improve on our specification). In contrast, the approach of using portmanteau dummies to control for all other aspects of policy seems to necessarily rely on assumptions that are clearly untenable.

Our model that includes demographics, policy variables, economic environment variables, along with a rich set of interactions among these groups of variables, contains a total of 245 parameters. This is remarkably parsimonious relative to the size of the portmanteau dummy variable specifications that we described above. It is also a small parameter set relative to our sample size (N=127,119).⁴⁵ Despite this, as we shall see, our model does quite a good job of explaining differences in welfare participation and work both *across* States and demographic groups, and *over-time* within States and demographic groups.

B. Policy and Economic Environment Variables

The third panel of Table 5 contains our *individual* level policy measures (PV-IND). These are constructed from the individual's demographic variables in conjunction with relevant policy variables. For example, the variable $WELFARE_BEN_{ist}$, which stands for AFDC/TANF benefit level, is constructed using the State payment standard for the corresponding family size of the single mother. And the variable $EITC_RATE_{ist}$, which stands for EITC phase-in rate, is constructed by combining information on Federal and

⁴⁵ Schoeni and Blank (2000) provides an interesting point of comparison, as it is fairly typical of work that uses a small set of variables to measure policy, and attempts to control for omitted policy variables using State and time dummies. Their model has 234 parameters, and, since they fit it to 14,076 State×year×age ×education cells, they have a smaller ratio of data points to parameters than we do (60 vs. 519).

State level EITC phase-in rates with the woman's family size information. In general, since we have individual level data, we have exploited every opportunity to tailor policy variables to the individuals based on the demographics we assume are exogenous.

Another example is the variable $MONTH_SINCE_WR_HIT_{ist}$, which measures the cumulative time elapsed since the woman may *potentially* have been subject to work requirements. In actual implementations of work requirement time limits, a woman who fails to satisfy work activity requirements is not typically expelled from the system as soon as a time limit is reached. Rather, she is subject to a series of sanctions and remedial measures that may eventually result in benefit termination if she fails to make a "good faith" effort to comply. Thus, we hypothesize that the effect of a "binding" time limit on behavior is likely to be increasing in the time that has elapsed since the time limit hit.

Construction of individual level work requirement measures is rather involved. Recall that States often exempt a woman with children below some threshold age (typically around 12 months) from work requirements. Thus, we must examine the age of all the woman's children, ask if each child would have exempted her from the work requirement when he/she was born, and if so, for how long (this is complicated because many States have changed the young child age exemption). We then add up all the possible child age exemptions from work requirements, which we use to calculate how long the woman may *potentially* have been subject to work requirements.⁴⁶ In contrast to this duration measure, the variable SWR_{ist} (i.e., short for "subject to work requirement") is simply a measure of the fraction of the year t that a woman may be subject to work requirements. This depends on whether her State of residence has a work requirement, whether she has potentially used up her work requirement time limit clock, and the fraction of the year that she may be exempted from work requirements if she has a young child.

The fourth panel of Table 5 lists our State level policy and economic variables (PV-ST). These variables vary across States and time, but do not vary across individuals in the same State and year. For instance, this set includes the length of the State's time limit clock, TL_LENGTH_{st} , the time elapsed since the State's time limit clock started under either waivers or TANF, $MONTH_SINCE_TL_START_{st}$, and whether the child portion of TANF benefits continues after time limits exhaustion $DCHILDBEN_{st}$. The last panel of Table 5 lists our Federal level policy variables (PV-FED). They only vary across time. These are the Federal minimum wage rate (in 2001 constant dollars) MIN_WAGE_t , and the lowest bracket federal income tax rate $INCTAX_RATE_t$.

⁴⁶ We should emphasize that in constructing this variable, we do *not* measure whether a woman is *actually* subject to a work requirement, or how long a woman has *actually* hit up against a "binding" time limit. The reason we use "potential" rather "actual" is that the "actual" measures would be endogenous (since they depend on the woman's work or welfare participation *decisions*), so they do not belong in a reduced form.

C. The Empirical Specification

In our regression models, the dependent variable, either $WEL_RECEIPT_{ist}$ or $WORK_{ist}$, is regressed on the full set of individual demographic variables (DEM), individual level policy variables (PV-IND), State and federal level policy variables (PV-ST and PV-FED) listed in Table 5. We also include a wide range of interaction terms between the policy variables and demographic characteristics of respondents. These are detailed in Table 6.

[Table 6 About Here]

The main rationale that led to most of the interaction terms in our model is the notion that welfare policy variables should have different effects on women with different labor market opportunities (i.e., offer wage rates), different levels of non-labor income (i.e., access to alimony/child support) and different fixed costs of working (e.g., whether they have young children). These three characteristics are, in turn, determined by the woman's age, race, education, prior marital status, and her children's ages. Thus, our basic strategy was to interact this set of demographic variables with each major policy variable.

Based on the descriptive statistics in Section 4, we know that welfare and work participation, and how these have changed over time, differ substantially across these demographic groups. Thus, we expect that these interaction terms will be crucial in fitting the data. There could also be important interactions between policy variables. For example, single mothers may be more or less responsive to work requirements if the EITC is more generous. Our model thus includes a number of policy interactions as well.

It is important to note that our specification was not chosen as the result of a specification search. That is, we did not add variables in an attempt to fit the data better, or delete variables that were insignificant. We specified our list of demographic, policy and economic environment measures, as well as the list of interaction terms, *a priori*.

6. Empirical Results

A. Evaluating the Fit of the Model

Before we can take seriously the implications of our model regarding the impact of welfare policy on behavior, it is important to verify that the model provides a good fit to the data. Figure 5 shows that the model accurately tracks both the level and changes in welfare and work participation rates of single mothers at the National level over the 1980-2002 period. This accomplishment may seem trivial, but it is important to recall that prior models that do not include time dummies have failed to achieve this result (see Section 2).

As we have no time dummies, our model explains changes in welfare participation over time based on changes in demographics, policy and the economic environment alone.

On the other hand, prior models that have included time effects have attributed much of the change in welfare participation to the time effects, which is in effect an admission of ignorance. As we show in Figure 5, inclusion of a fifth order time polynomial in our model leads to essentially no improvement in model fit.⁴⁷ It also leads to almost no change in the model's predictions regarding various policy changes. In other words, the model assigns no significant role to unmeasured time varying factors at the National level.

[Figures 5-12 About Here]

Figure 6 shows the model's fit to welfare participation rates in 8 large States. It is not surprising that our model doesn't fit the changes in welfare participation over time as well at the State level as at the National level, since at the State by year level sample sizes are much smaller, generating much more noise in the actuals. Nevertheless, our model replicates quite well both the *level* differences across States and the within State *changes* in participation rates over time.

For example, in the early 1980s, welfare participation rates in Texas were around 20%, while those in Michigan were around 45%. Our model is able to generate these cross-State level differences quite accurately using demographic and policy differences alone, *without* the use of State dummies. The main failure of the model is that it consistently overestimates welfare participation in California by about 5% in the 1980-1993 period. But on the whole the fit at the State level seems quite good.⁴⁸ Most strikingly, the model correctly predicts that welfare participation began to trend down in Michigan, Illinois and Pennsylvania way back in the mid-1980's - well before the National down trend began.

Figure 7 shows the model's fit to work participation rates in 8 large States. Here the fit is excellent. For instance, the model correctly predicts the steady upward trend in work in Michigan over the whole 1983-2000 period. It also correctly predicts that work was flat in California from 1980-1995, jumped up rapidly in 1996-98, and then flattened again. And it predicts the several turning points in work in Florida and Pennsylvania quite well. Bear in mind that this is all done without using any State or National time effects.

⁴⁷ Our model produces an R^2 of 0.2403 for welfare participation and 0.2064 for work participation. Adding a fifth order polynomial in time increases the R^2 by 0.0003 for both specifications, which is trivial.

⁴⁸ Adding State dummies increases the R^2 to 0.2489 for welfare participation, and to 0.2095 for work participation. These changes are significant, but seem quantitatively small.

Figures 8-12 show how the model fits the behavior of various demographic groups. In each Figure, the left column contains graphs of welfare participation rates, and the right column shows work participation rates. The demographics we examine are race, education, prior marital status, age of youngest child, and number of children. All the figures convey the message that our models fit the level differences across demographic groups, as well as changes over time within groups, very well. It is important to bear in mind that all these group differences are being explained without the use of any group specific time effects.

We could, if not for space limitations, show that our model fits equally well if we further narrow down the demographic groups to, for example, combinations of race and marital status, etc., and also for other States besides the large ones we have examined, as well as for various demographic groups within States. The fact that the model fits quite well in all these dimensions is comforting with respect to whether we have successfully included most of the key time varying factors driving behavior over this period.

One might be tempted to argue that it is not surprising we can fit the data so well given that we have 245 terms in our regression. In our view, such an assertion would be misguided for two reasons. First, as we have pointed out, an alternative empirical model that included State \times year interactions would have 1173 parameters plus any policy variables. Such a model would not be able to explain differences across demographic groups unless one included demographic \times policy interactions - leading to a vastly expanded version of our model. On the other hand, inclusion of demographics \times year interactions would lead to many thousands of additional parameters. Thus, our model is actually quite parsimonious compared to such alternatives.

Second, we require our model to fit not only the National work and welfare participation trends, but also how participation rates vary over time by State and demographic group. This is a very stringent test for the model. For example, a simple fifth order polynomial in time fits National rates quite well, but completely fails to capture how changes in welfare and work participation rates have differed across States and demographic groups. A model with State \times year effects would fit changes over time by State, while failing to fit changes over time by demographic group, yet it would have many more parameters than our model. Thus, one can easily envisage specifications with many more parameters than ours that would nevertheless fail to fit well in all the dimensions we examine.

B. Interpreting the Estimates

In models with many interaction terms it is difficult to interpret individual coefficient estimates. Thus, instead of presenting our parameter estimates, we try to give an intuition for what the estimates mean by presenting predicted probabilities of welfare participation

for a set of single mothers with different demographic characteristics under a variety of policy regimes. We focus on the model's implications regarding the differential impact of work requirements, time limits and the unemployment rate on single mothers with different demographic characteristics.

In Table 7 we report the probability of welfare participation as predicted by the model for 16 different types of single mothers under two policy regimes: one without a work requirement or a time limit, the other with both a work requirement and a time limit. To obtain 16 representative people, we vary the mother's race, education, prior marital status, and age of youngest child, while holding other characteristics fixed. For each dimension we consider two settings: black/white, high school dropout/BA or higher, never married/divorced, age of youngest child either 2 or 13. Regarding other characteristics, each woman is assumed to have two children, with the oldest child being 15; the women's age is 35; they live in a State with monthly welfare benefits of \$500 etc. We also vary the economic environment by setting the unemployment rate at 4%, 6% or 8%.

[Table 7 About Here]

Table 7 shows that our model yields plausible response patterns. In all cases, the more educated women have much lower predicted rates of welfare participation. The percentage point drop in welfare participation in response to the imposition of time limits/work requirements is much greater for high school dropouts than for women with BA's (who should be relatively insensitive to welfare policy). Typically, blacks responded more to work requirements/time limits than whites. And women with younger children responded more than women with older children. The model predicts that welfare participation rates are higher, and the welfare reducing effects of work requirements/time limits are slightly greater, when unemployment is higher.

C. Explaining the Drop in the Welfare and Increase in Work

In this section we present the central element of our analysis, in which we use our model to decompose the contributions of various components of the welfare reform and other economic as well as policy variables to the drop in the welfare participation rate and the increase in the work participation rate from 1993 to 2002. Our approach is as follows. We conduct six counterfactual experiments (detailed below). In each experiment, we use the model to simulate what welfare and work participation would have been from 1994 through 2002 under the hypothetical that a specific economic or policy variable of interest stayed fixed at its 1993 level, while all other policy and economic variables follow their actual post-1993 paths. The difference between the predicted welfare and work participation rate under the experiment vs. when the variable in question is allowed to

take its actual historical path is then said to be the contribution of the variable to the change in welfare and work from 1994 through 2002. The six experiments are as follows:

- **[TL] No Time Limit.** In this counterfactual, we assume that no States implemented time limits. The counterfactual data is generated by setting DTL_{st} and all terms interacting with DTL_{st} to zero for all years from 1993 onward.
- **[WR] No Work Requirement.** In this counterfactual, we assume that no States implemented work requirements. The counterfactual data is generated by setting $DWORKREQ_{st}$ and interactions with $DWORKREQ_{st}$ to zero from 1993 onward.
- **[EITC] No EITC Expansion.** In this counterfactual, we assume that the Federal and State level EITC phase-in rates of 1993 are maintained through 2002, and that the real value of the maximum EITC credit also stays fixed at the 1993 level. Recall that $EITC_RATE_{ist}$ and $EITC_MAX_{ist}$ are both individual level policy variables. Thus, we hold the way they vary with family size fixed as per the 1993 rules as well.
- **[UNEMP] No Unemployment Rate Change.** In this counterfactual, we assume that the State level unemployment rates did not change from 1993 onward.
- **[CCDF] No CCDF Expenditure.** In this counterfactual, we assume that the States did not have childcare subsidy programs. The counterfactual data is generated by setting $CHILDCARE_{st}$ and all of its interaction terms to zero.
- **[MEDICAID] No Medicaid Expansion.** In this counterfactual, we assume that Medicaid did not expand from 1993 onward. We construct counterfactual values of $MEDICAID_PCT_{ist}$ and $MEDICAID_FPL_{ist}$ for all individuals observed after $t > 1993$ using Medicaid rules used in State s in 1993.

I. Decomposing the Contributions to the Welfare Participation Rate Drop

Table 8 summarizes our results on the effects of various welfare reform policies on welfare participation, by year. Column 1 lists a year from 1997 through 2002, and column 2 lists the percentage-point change in welfare participation from 1993 until that year, as predicted by our model. The subsequent columns of the table correspond to various policies. In each case, we report how many percentage points less the welfare participation rate would have dropped if that policy change had not been implemented.

For example, in the top panel of Table 8a, if we look at the row for 2002, the second column indicates that our model predicts a welfare participation rate drop of 23.77 points from 1993 to 2002. The third column indicates that, if time limits had not been implemented in any State, the drop in welfare participation would have been 2.52 points less. This means that, according to our model, time limits accounted for only 2.52 points out of the 23.77 point drop in welfare participation, or 10.6%. Thus, our model implies that time limits were a relatively small factor in generating the overall caseload decline.

In contrast, if we look at the next column of Table 8a, we see that, according to our model, the drop in the welfare participation rate from 1993 to 2002 would have been 13.61 points less if no States had implemented work requirements. Thus, the model implies that work requirements accounted for 57% of the decline in welfare participation among single mothers from 1993 to 2002.

According to our model, the second largest factor driving down welfare participation was EITC expansion. Our estimates imply that this accounted for a 6.2 percentage point drop in welfare participation from 1993 through 2002, which was 26% of the overall decline.

The next column of Table 8a reports the effect of the unemployment rate. What we see here is quite interesting. According to the model, from 1993 through 1997 the unemployment rate accounts for a 2.38-point drop in the welfare participation rate, which was 21% of the overall decline that had occurred up until that time. However, in the recession of 2001-2002, the impact of unemployment is lessened. This is because the unemployment rate in 2002 was no longer so much lower than it had been in 1993. Thus, for the whole 1993-2002 period, our model says that the macro economy accounts for only 1.58-points of the welfare participate rate decline, which is only 7%.

[Table 8 About Here]

Aside from work requirements (57%), EITC (26%), time limits (11%) and the macroeconomy (7%), we did not find other variables that seemed to have a major effect on the evolution of welfare caseloads.^{49, 50} In Table 8a we also report results for CCDF expansion and Medicaid expansion, both of which had very small predicted effects. In fact, these predicted effects are of the “wrong” sign relative to our expectations, but they are so close to zero we doubt they are significant. There could be several explanations for this. For example, many States give preference to TANF recipients or woman

⁴⁹ Note that total shares do not necessarily sum to less than one. The reason is that in the actual model we have included interaction terms among various combinations of the policy variables. Our method of decomposition, however, assumes that in each counterfactual, only one variable deviates from the actual.

⁵⁰ Prior research, such as CEA (1997, 1999) suggested that the strictness of sanctions for failure to satisfy work requirements is a key factor. A related variable is the ease with which one can obtain exemptions from work requirements. Our variables capturing these aspects of policy are whether a State has a full or partial (ultimate) benefit sanction for failure to satisfy work requirements, and the number of work requirement exemptions allowed (maximum = 3). To examine the importance of these variables, we conducted two counterfactual experiments. In the first, all economic and policy variables were kept at their actual values, except that all States are “lenient” (i.e., only partial sanctions and 3 exemptions). In the other, all States are “strict” (i.e., full sanctions and no exemptions). Our model predicts that welfare participation would have been 1.5 percentage points higher in 2002 under the lenient regime than under the strict regime, while the work participation would have been 0.5 percentage points higher under the strict regime. Thus, the strictness of work requirement implementation does have a noticeable effect (i.e., about half as large as the effect of time limits), but it is far less important than work requirements *per se*.

transitioning off TANF in the allocation of limited CCDF funds. This could actually create an incentive for TANF participation (see GAO 1998b).

The bottom two panels of Table 8a examine the determinants of the welfare participation rate drop separately by race. According to our model, the macro economy played a larger role in the participation rate drop for blacks than for whites. This is consistent with the notion that employment opportunities are more sensitive to macro economic conditions for blacks than for whites. In fact, our results in Table 9 confirm this. Table 9 is like Table 8, except that it examines the role of different factors in explaining the increase in work participation rates. According to Table 9a, the macro economy led to a 4.4-point increase in the work participation rate for blacks over the 1993-2002 period, but only a 1.86-point increase in the work participation rate for whites.

Our model also implies that work requirements are relatively more important in explaining the welfare participation rate drop for whites than for blacks, while time limits played a relatively larger role for blacks.

Table 8b examines the determinants of the welfare participation rate drop from 1993 to 2002 separately by demographic group. The first panel breaks down the effects of different policies by age of the single mother's youngest child. Regardless of children's age, the importance of time limits is small compared to that of work requirements and EITC. However, there is evidence that time limits are more important for single mothers with younger children, consistent with results in Grogger (2000) and Grogger and Michalopoulos (2003). However, consistent with our discussion in Section 3.A, the difference is much less apparent if one looks at percentage changes, since the single mothers with young children start from a much higher base participation rate.

The second panel in Table 8b shows that time limits were a much more important factor for single mothers who are high school dropouts than for those with high school or more education, both in percentage point terms (7 vs. 2-points) and in percentage terms (19% of the drop in welfare participation vs. 9%). This is what we would expect in a dynamic model, since high school drop out mothers have higher rates of unemployment and therefore have a greater incentive to bank eligibility under time limits.

The third and fourth panels show that time limits are relatively important for never married single mothers, and for single mothers with two or more children (vs. only one child). This is again consistent with these groups having relatively high baseline unemployment rates, implying that they have a greater incentive to bank time.

II. Decomposing the Contributions to the Work Participation Rate Increase

Table 9 summarizes our results on the effects of various welfare reform policies on work participation. According to the top panel of Table 9a, of the overall 10.82 percentage point increase in work from 1993 to 2002 predicted by the model,⁵¹ the model implies that 3.61 points were due to the EITC expansion (33%), 2.66 points were due to the macro economy (25%), 1.79 points were due to work requirements (17%) and 1.11 points were due to time limits (10%).

[Table 9 About Here]

Thus, the ranking of the policy variables in terms of their impact on work participation are drastically different from their ranking for welfare participation. The macro economy, as captured by local unemployment rates, was, until 2001, the most important contributor to the work participation increase. If we look at the 1993-2000 period, the macro economy accounts for more than 40% of the total work participation increase. But its contribution has recently dropped, reflecting the recession in March 2001. By 2002, EITC was the most important factor.⁵²

The first panel of Table 9b examines the determinants of the increase in work in 1993-2002 separately by age of the youngest child. A very important result is that the macro economy has been much less important for mothers with young children (i.e., those in the 0-6 age group). For this group, our model says that EITC expansion and work requirements were the largest factors increasing work over the 1993-2002 period, accounting for 44% of the increase. This is not surprising, because mothers with young children are traditionally much less likely to participate in the labor market, and therefore they should be less sensitive to macro economic conditions.

The fact that single mothers with young children have, to a greater extent than is true for other groups, been forced into employment by work requirements, does raise concerns about the impact of mother's work on young children. This is an important topic for future research.

⁵¹ Recall that the work participation rate of single mothers actually increased by 11.3 percentage points from 1993 to 2002 in the data.

⁵² According to the top panel of Table 8a, our model implies that EITC generated 6.21 percentage points of the drop in welfare participation from 1993 to 2002. Thus, it may seem puzzling that, according to Table 9a, EITC accounts for only a 3.61 percentage point increase in the work participation rate. Presumably, EITC gets women off welfare by getting them to work, so we might expect that these effects should be roughly equal. The discrepancy arises because, as we discussed in Section 4.D, work and welfare are not mutually exclusive. Expansion of EITC encourages some single mothers who were working while on welfare to switch to full-time work only. This reduces welfare while not increasing work. Thus the number of single mothers who leave welfare due to EITC expansion should be larger than the number who start working due to EITC – consistent with what we find. Recall that, in general, the decrease in welfare participation (23 percentage points) was more than twice as great as the increase in work (11.3 percentage points).

The second panel of Table 9b contains some interesting results on how various policies differentially affect single mothers who are high school dropouts vs. those with a high school or more education. It is striking that work requirements account for 42% of the 17 point increase in work participation among high school drop outs, while they account for a negligible part of the 7 point increase in work participation among the more educated single mothers. The increase in work for the more educated group is driven almost entirely by the EITC (55%) and by the macro economy (40%). These results are exactly what one would expect. The more educated women have higher offer wage rates, and were therefore more likely to be close to the margin where they would be better off working than on welfare. The EITC wage subsidy and a stronger macro economy could easily push them over that margin. On the other hand, the high school drop out women have worse labor market opportunities, so a work requirement may be necessary to push them off welfare and into market work. The third and fourth panels show the decomposition by the single mothers' marital status and number of children.

This also suggests that the impact of welfare reform on “welfare” (in the technical sense) for these two groups of women may be radically different. Women who choose to work because an improved economy and enhanced EITC drove up their effective wage rates must be better off. Women who entered the labor market because of a binding constraint induced by work requirements must be worse off. This is an important topic for future research.

Our simulations seem to have a great deal of face validity, in the sense that when we predict that different policies had different effects on different groups, the differences are in line with what one would expect in light of economic theory.

III. Robustness checks

Given that our model contains 245 variables, to allay concerns that our results might be sensitive to possible collinearity problems we also estimated a “sparse” specification that eliminated 88 of the interaction terms. The interaction terms that we dropped are indicated in brackets in Table 6. We dropped these 88 terms because, in our *a priori* judgment, they represented interaction effects that we thought would be relative weak or subtle.⁵³ This simpler model fit nearly as well as the full model, and it produced very similar predictions. We take this as evidence that collinearity is not a concern.

⁵³ More specifically, the basic rationale for what we dropped was as follows: In our model there are several policy areas, like time limits, work requirements, etc., each characterized by several variables. In the full model, the demographics are interacted with each of the several variables within each policy area. In the sparse model, we only interact the demographics with one or two of the variables within each policy area. The ones we chose to interact were the policy variables that we felt (*a priori*) were the most important within each policy area.

A number of critics have suggested it is not surprising that our model fits the data so well in so many dimensions, simply because it contains 245 parameters. It has also been suggested that the variable $MONTH_SINCE_WR_START_{st}$ plays a role similar to a linear time-trend that starts up right around 1996-1997 in most states, and that the model can explain the recent dramatic drop in caseloads and increase in work simply because it includes such a trend variable. These critics have suggested that, even if we were to randomly assign the State specific policy variables to women (regardless of their true State of residence), the model would still fit the data well. To address this concern, we constructed an artificial dataset in which welfare policy variables were randomly assigned to each woman (e.g., we take each woman in the CPS, and assign her, with equal probability, the set of policy variables appropriate for one of the 50 States or D.C.).

This model fit aggregate patterns of welfare and work participation, as well as the patterns by demographic group, rather well. But it fit the State level data quite poorly. Not surprisingly, it largely missed the important cross State differences in *levels* and *changes* of welfare and work participation that we discussed in detail in Sections 4.A, 4.B and 6A. In particular, it completely misses the fact that welfare participation peaked much earlier than 1993-1994 in many States. This model also produced some very odd predictions of policy effects. For example, it implied that work requirements accounted for almost the entire drop in welfare participation, that the macro economy played a negligible role in the 1993-1999 period (and, in fact, that it slightly *reduced* employment), and that time limits slightly *increased* welfare participation (while nevertheless accounting for a large part of the increase in work!). We take these very odd results as confirmation that it is important to carefully code policy variables at the State and individual level in order to avoid collinearity and provide plausible estimates of policy effects.

7. Conclusion

It has been a decade since States began implementing welfare reform under AFDC waivers, and seven years since the implementation of the overhaul of U.S. welfare system under PRWORA. Judging from the more than 60% drop in welfare caseloads and welfare participation rates, and the close to twenty percent increase in work participation rates among single mothers, these policies would seem to have been a major success. However, these successes were achieved in one of the greatest economic expansions since WWII, and amid a wide range of other economic and policy changes, most notably a dramatic expansion in Earned Income Tax Credit, Medicaid, Child Care Development Fund expenditures, etc. To make better policy in the future, it is important to understand what exactly were the contributions of these various policy components to the behavioral changes that occurred over the past decade.

While many researchers have studied the impact of particular policies or subsets of policies, our paper is more ambitious in the sense that we have made a major effort to compile, at the State level, measures of all the key policy and economic environment variables that we think may have substantially influenced the behavior of single mothers over the 1980-2002 period. We then merged this policy data with individual level data from the March CPS 1981-2003. Using these data, we have developed a model that can successfully explain both the *level* and *changes* in the welfare and work participation rates across States, across time, and across various demographic groups (all without using State and year dummies) for the 1980-2003 period.

We then used our estimated model to disentangle the contributions of various components of the welfare reforms, as well as other contemporaneous economic and policy changes, to the changes in welfare and work participation rates for single mothers from 1993 to 2002. Our main findings are that the key economic and policy variables that account for the 23 percentage-point decrease in the welfare participation rate were work requirements (57%), the EITC (26%), time limits (11%) and the macro economy (7%). The main factors contributing to the overall 11 percentage point increase in the work participation rate of single mothers from 1993-2002 were, in order of relative importance, the EITC (33%), the macro economy (25%), work requirements (17%) and time limits (10%).

Our model implied some important differences across demographic groups in the impact of these policies. For instance, it was the macro economy and EITC that largely explain the increase in work among relatively well educated single mothers, while work requirements were a much more important factor for high school drop outs. This is not surprising; since more educated mothers presumably have higher offer wages, an enhanced EITC wage subsidy plus a stronger macro economy could easily push them over the margin where they choose to work. On the other hand, if high school dropout women entered the labor market because of a binding constraint induced by work requirements, they were presumably made worse off. Thus, how welfare reform has affected the well-being of high school dropout single mothers and their children is an important topic for future research.

Our research also highlights the crucial difference between “leaving welfare” and “work.” A troubling development is that about one-quarter of the welfare leavers actually did not work. What are the characteristics of these people? What happens to the well being of their children and themselves? These are important questions for future research. In this regard, the EITC seems to be a particularly attractive policy because it scored high both as a factor reducing welfare participation and as factor increasing work. Work requirements, on the other hand, seemed to be a much more effective at getting single mothers to exit welfare than at getting them to enter market work.

This paper uses a simple methodology to address some important policy questions. But we made exogeneity assumptions about educational attainment, marital status and number of children. In a life-cycle model with forward-looking mothers, these demographics will certainly be endogenous. Thus, an important topic for further research is how welfare policy affects education, marriage and fertility decisions (see Keane and Wolpin, 2002a 2002b and 2003 for some work on this topic).

Another issue is that, in a dynamic framework, it is not just current policy measures but also expected future policy measures that affect current decisions. A fundamental tension in prior work on the impact of welfare time limits (both eligibility time limits and work requirement time limits), including our own work reported here, is that the incentive to bank time that is estimated in this work only exists if women are forward-looking. But if women are forward-looking, then any model that fails to include expected future benefits as a determinant of current choices is mis-specified (except under strong assumptions about expectations and the process generating future benefits).

To be more concrete, it is entirely possible that some part of the welfare participation decline that began in the mid-1990s occurred because single mothers were forward looking and anticipated that welfare participation would be made more difficult in the future (due to some combination of work requirements, time limits and reduced benefits). If one thinks that future welfare participation is less likely and future work is more likely, it enhances one's incentive to invest more in human capital today (by working). Our modeling framework cannot address this point.

Finally, we note that the reliability of our decomposition of the role of various factors in reducing welfare and increasing work hinges crucially on the assumption that we have successfully measured and included in our analysis all the key factors involved. If we have omitted any important factor, it may load onto the factors we have included. After months of intensive data collection, we were unable to identify other aspects of the policy or economic environment that we felt could plausibly be taken to be important. Indeed, we attempted to include a reasonable measure of every aspect of welfare reform and the economic environment hypothesized as potentially important in the survey by Blank (2002). Of course, it is quite likely that some of our policy *measures* could be improved, but it is difficult to think of key policy variables we have completely omitted.

Perhaps our most plausible omission is an intrinsically difficult to measure quantity, a change in "culture." This could take two forms: A change in the culture of welfare offices to a "welfare-to-work" emphasis, or a change in the general culture that has made welfare receipt somehow seem less desirable. However, we do not understand how such changes

in “culture” could be generated, except via measurable quantities such as imposition of work requirements, stronger sanctions for violating work requirements, and imposition of time limits, all of which we have included. In that case, it is quite appropriate, in a reduced form specification, for the coefficients on these measurable policy instruments to pick up how they affect “culture.”

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Appendix A. Impact of Time Limits

Here we lay out a simple model of welfare participation decisions by forward-looking wealth-maximizing agents when there are time limits. Suppose there are only two choices: welfare participation only (choice 0) and work only (choice 1). The value of each choice is given by:

$$\begin{aligned} W_{0t}(S, T) &= B_t + \delta V_{t+1}(S-1, T-1), \\ W_{1t}(S, T) &= E_t + \delta V_{t+1}(S, T-1). \end{aligned}$$

Here, B_t is the welfare benefit in month t , E_t is the earnings the woman can obtain if she works (determined by her wage and employment offers). The term $V_{t+1}(S, T)$ denotes the expected present value of lifetime wealth at time $t+1$ given that the woman has S months of eligibility that may be spread over a T -month horizon. The term $W_{0t}(S, T)$ denotes the value of participating in welfare (choice 0) at time t , given that the woman has S months of eligibility that may be spread over a T -month horizon. This equals the current welfare benefit the woman will receive B_t , plus the discount factor $\delta \in (0, 1)$ times $V_{t+1}(S-1, T-1)$ -- the woman's expected present value of lifetime wealth at time $t+1$ given that she has chosen to be on welfare at t . Note that the first argument of this function is $S-1$, since if the woman uses welfare today she will only have $S-1$ periods of eligibility left when she gets to the next period. Similarly, $W_{1t}(S, T)$ denotes the value of working only (choice 1). This equals the current earnings the woman will obtain from working E_t , plus the discount factor δ times $V_{t+1}(S, T-1)$ -- the woman's expected present value of lifetime wealth at time $t+1$ given that she has chosen to work and not be on welfare at t . Note that the first argument of this function is S , since if the woman does not use welfare today she still has S periods of eligibility left when she gets to the next period.

A key point is that $V_{t+1}(S, T-1) > V_{t+1}(S-1, T-1)$ as long as $S < T$. That is, one is better off if one gets to time $T+1$ with more available months of eligibility remaining. Optimal behavior in this model is to try to time the use of one's S periods of potential welfare participation eligibility to coincide with those periods when the realization of E_t is relatively low. Define $\Delta_{t+1}(S, T) = \delta[V_{t+1}(S, T-1) - V_{t+1}(S-1, T-1)] \geq 0$ as the "option value" of preserving a month of welfare eligibility. The optimal decision rule for working in this model is to work if:

$$W_{1t}(S, T) - W_{0t}(S, T) = E_t - B_t + \Delta_{t+1}(S, T) > 0.$$

Or, more intuitively:

$$E_t + \Delta_{t+1}(S, T) > B_t.$$

The main point is that it is not optimal to choose welfare over work just because $B_t > E_t$. In fact B_t must exceed E_t by an increment at least as great as the option value of saving a

month of eligibility $\Delta_{t+1}(S, T)$ in order for it to be optimal to choose welfare. This is the basic intuition for why time limits would be expected to reduce welfare participation, even before people have reached the limit.

Things get more complex if we add the option of working and participating in welfare at the same time (choice 2). The value of this option is:

$$W_{2t}(S, T) = B_t + (1 - \tau)E_t + \delta V_{t+1}(S - 1, T - 1)$$

where τ is the rate at which earnings are taxed in the welfare benefit formula. Now, in order for it to be optimal not to participate in welfare, a second condition must hold. It must also be the case that:

$$W_1(S, T) - W_{2t}(S, T) = \tau E_t - B_t + \Delta_{t+1}(S, T) > 0.$$

By working only (choice 1) rather than work and welfare (choice 2), a woman gains τE_t and loses B_t . Equivalent but more intuitively:

$$\tau E_t + \Delta_{t+1}(S, T) > B_t.$$

As the benefit tax rate approaches 0, it becomes less likely that this condition will be satisfied. In fact as $\tau \rightarrow 0$, the condition approaches $\Delta_{t+1}(S, T) > B_t$ and a person would always choose to participate in welfare. To see this, note that the largest possible value of $\Delta_{t+1}(S, T)$ occurs when $S = 1$ and one is certain that she would choose to participate in welfare at $t + 1$. In that case $\Delta_{t+1}(S, T) = \delta B_t$, since by using up the year of eligibility one loses B_t with certainty next period. Thus, the condition becomes $\delta B_t \geq \Delta_{t+1}(S, T) > B_t$, which is impossible for $\delta < 1$. This further implies that there exists some $\bar{\tau} > 0$ such that it is never optimal to “bank” years of eligibility if $\tau \leq \bar{\tau}$.

We also point out that $\Delta_{t+1}(S, T)$ will be *decreasing* in the pool of extensions, *decreasing* if the fraction of benefits one continues to receive after reaching the time limit, *increasing* in the likelihood of future unemployment, *increasing* in the level of benefits, *decreasing* in the probability of marriage (or any other event/variable that would reduce the probability of participating in welfare in the future). Thus, we should interact indicators for time limits with any variables that help determine the above quantities (e.g. education could affect probability of unemployment).

The idea that time limits could have played a major role in the decline of welfare caseloads in the early TANF period of 1996-2001 rests on the presumption that the anticipatory effect is substantial, since few people were subject to binding time limits prior to 2002. But it strikes us as implausible that the effect of time limits could have been substantial – given how TANF was actually implemented. The very simple analysis of the

anticipatory effect presented above ignores several crucial features of actual State TANF plans. Most obviously, we have noted that a large percentage of the caseload resided in States that did not enforce a time limit or that stopped the clock for working participants. Other features of many actual State plans that reduce the “option value” of banking months of eligibility are generous earnings disregards for employed TANF participants, and rather modest partial benefit reductions when the time limit is reached.

The ways that partial benefit reductions and generous treatment of earned income reduce incentives to bank time can be clarified using some simple numerical examples. These examples also help elucidate how the AFDC/TANF benefit formulas work. For example, in Illinois, the monthly TANF benefit for a family of three with no income is \$377, and the benefit reduction rate is 33% of earnings. A woman working 130 hours per month at \$6.00 per hour would be taxed \$257 (ignoring work expense deductions), leaving \$120 per month in TANF benefits if she decided to participate. In principle, there might be an incentive to pass up the \$120 in order to preserve eligibility to get the full \$377 in some future month, if the woman thought it was likely that she could, say, face some future protracted unemployment spell. But in Illinois, if a woman works while receiving welfare that time is not counted against the clock, so there is no such incentive.

Even if work didn't stop the clock, it is not at all clear that banking the month would be optimal in this situation. It could only be optimal to pass up a certain \$120 today in favor of \$377 at some hypothetical future point if the probability of future unemployment were quite high. For example, a just divorced woman with a 8-year old child facing this choice in a State with a 5-year limit should only begin to consider passing up the \$120 today if she feels there is a non-negligible probability she will be unable to find work for 5 years out of the next 10 (her time horizon until the child reaches 18). Otherwise there is almost no chance she will ever be able to use the banked time. We can see that accounting for discounting, or the fact that she might re-marry in the future, would further diminish the option value to preserving months of eligibility.

Some States have even more generous earnings disregards. For example, Connecticut exempts 100% of earnings up until the point where total income from work and benefits reaches the poverty line. Under this system, there is no incentive whatsoever to bank months, so long as the person can save and the sum of earnings plus benefits does not exceed the poverty line. As long as the woman discounts future income, she should prefer to take her TANF benefits now rather than later. Apparently, the participants and caseworks realized this. According to BFFA (p. 133) “Surveys of recipients and staff found that workers did not actively encourage most recipients to leave welfare quickly in order to bank their months of eligibility. In fact, such a message would not have been credible ... Individuals who found employment would usually continue to receive their

full welfare grant ... Thus, in order to bank months, a recipient would need to give up \$543 per month in benefits.”

As another example, California has a 5-year time limit, but the penalty for reaching the limit is only loss of the adult portion of benefits. In 2000 the maximum TANF benefit for a family of 3 was \$626 per month, while that for a family of 2 was \$505 per month. So the penalty is only the loss of \$121 per month. Would one pass up \$626 today just to preserve eligibility for \$626 rather than \$505 in some future month? Of course not.

Does the option to work while on welfare change the calculation? California disregards the first \$225 of monthly earnings, plus 50% of earnings beyond that. Thus, if a woman could earn \$780 per month, her benefit reduction would be \$278. This gives a 3-person benefit of $\$626 - \$278 = \$348$ and a 2-person benefit of $\$505 - \$278 = \$227$. Could it be optimal to give up \$348 today to preserve eligibility for a benefit of \$348 rather than \$227 in some future month? That would mean reducing this month’s income from \$1128 to \$780, in order to have an income of \$348 instead of \$227 in the event of some future month of unemployment. One could rig up a numerical example where such a choice would be optimal, by ruling out saving, making marginal utility diminishing extremely strongly in income, making the risk of future unemployment very high, and ruling out any other sources of support when unemployed. But it would seem quite implausible.

To summarize, time limits may make the option of working (and staying off welfare) more attractive relative to welfare by adding an extra element to the value of working – that is, the option value of preserving a future month of welfare eligibility. But, in States with generous earnings disregards and States that only reduce (rather than eliminate) benefits when the limit is reached, this option value is likely to be small relative to the current TANF benefits a person would have to pass up in order to bank a month of eligibility. Thus, as a practical matter, we expect that any anticipatory effects of time limits in most actually existing State TANF plans should have been small.

Appendix B. Effects of Maintenance of Effort (MOE) Requirement

The maintenance-of-effort (MOE) provision in Section 409 of PRWORA stipulates that the Department of Health and Human Services can reduce a States’ Federal TANF block grant if the State fails to maintain its level of assistance for needy families at 75% of their “historical level.”⁵⁴ The historic level referred to peak year (usually 1994) spending on the whole range of programs replaced by TANF (such as AFDC and AFDC-related

⁵⁴ If a State failed to achieve a required work participation rate for its welfare participants, the MOE requirement could be raised to 85%. The work requirement was reduced if a State achieved certain caseload reduction targets. Since caseloads fell so dramatically, these caseload reduction credits rendered the work requirement targets essentially irrelevant until recently.

childcare). This feature was designed to prevent a feared “race to the bottom,” where many States might start to cut assistance once federal AFDC matching funds vanished.

But the MOE requirement has had some dramatic and unexpected consequences. The critical feature of the MOE requirement was that “qualified” expenditures were defined as including not just cash assistance paid through the TANF, but a range of non-TANF spending as well. These alternatives included childcare assistance, and educational and job training activities. Critically, such benefits could be paid to any low-income family, even if they were not TANF recipients. As welfare caseloads dropped dramatically after 1996, causing expenditures on TANF cash assistance to fall, the States were essentially forced by the MOE requirement to redirect money into other qualified programs. To a great extent, the States responded by funneling substantial resources into subsidized day care for low-income families (see GAO 1998c). The effect can be seen in Figure 4, which shows the increase in CCDF expenditures from roughly \$3.0 billion in 1995 to \$8.0 billion in 2001.

Since child-care is obviously one of the most important costs of working for single mothers with young children, the increase in child care subsidies after 1996 should have provided enhanced work incentives for this group. Interestingly, MOE can create a feedback loop that perpetuates the impact of welfare reform. That is, welfare reforms that reduce caseloads and encourage work cause State spending on cash assistance to fall. This in turn induces States to spend more on day care and other work expense subsidies, which causes caseloads to drop further – thus generating a virtuous cycle. Interestingly, the MOE rule can create a situation of *multiple equilibria*. In one, States have high welfare caseloads and low work expense subsidies. In the other, States have low caseloads and high subsidies. Moreover, the high subsidy equilibrium is fiscally sustainable because welfare spending is low. Below, we formalize this argument. Moreover, we show that under plausible assumptions about the dynamics of States’ budget processes, the high child-care subsidy/low welfare participation equilibrium is the only stable equilibrium.

Our model of the effect of the MOE clause on the welfare caseloads can be described as follows: Suppose that there is a continuum of single mothers with measure 1 in the population. In every period, single mothers receive a job offer with wages (net of cost of working) independently drawn from a distribution F ; and they decide whether or not to work. If a woman works, she obtains her net wage draw; and she can also receive a childcare subsidy $s \geq 0$ from the State government. If she chooses not to work, she receives welfare payment $z > 0$. Thus a woman will work iff $w + s > z$, or $w > z - s$. Thus given the policy variable pair (z, s) , the total measure of welfare participating women is $F(z - s)$.

Following the spirit of the MOE requirement of PRWOA, we assume the State is required to spend a total of $B > 0$ on assistance to single mothers. We assume that the welfare assistance level z is fixed through time. As the law stipulates, the State government's expenditure on both cash welfare assistance and childcare subsidies to low income women both qualify as MOE expenditure. Thus for a fixed z , any level of s that satisfies

$$zF(z - s) + s[1 - F(z - s)] = B$$

will constitute an equilibrium. Depending on the level of B , multiple levels of s may be consistent with equilibrium (see Figure B1 for an illustration).

[Figure B1 About Here]

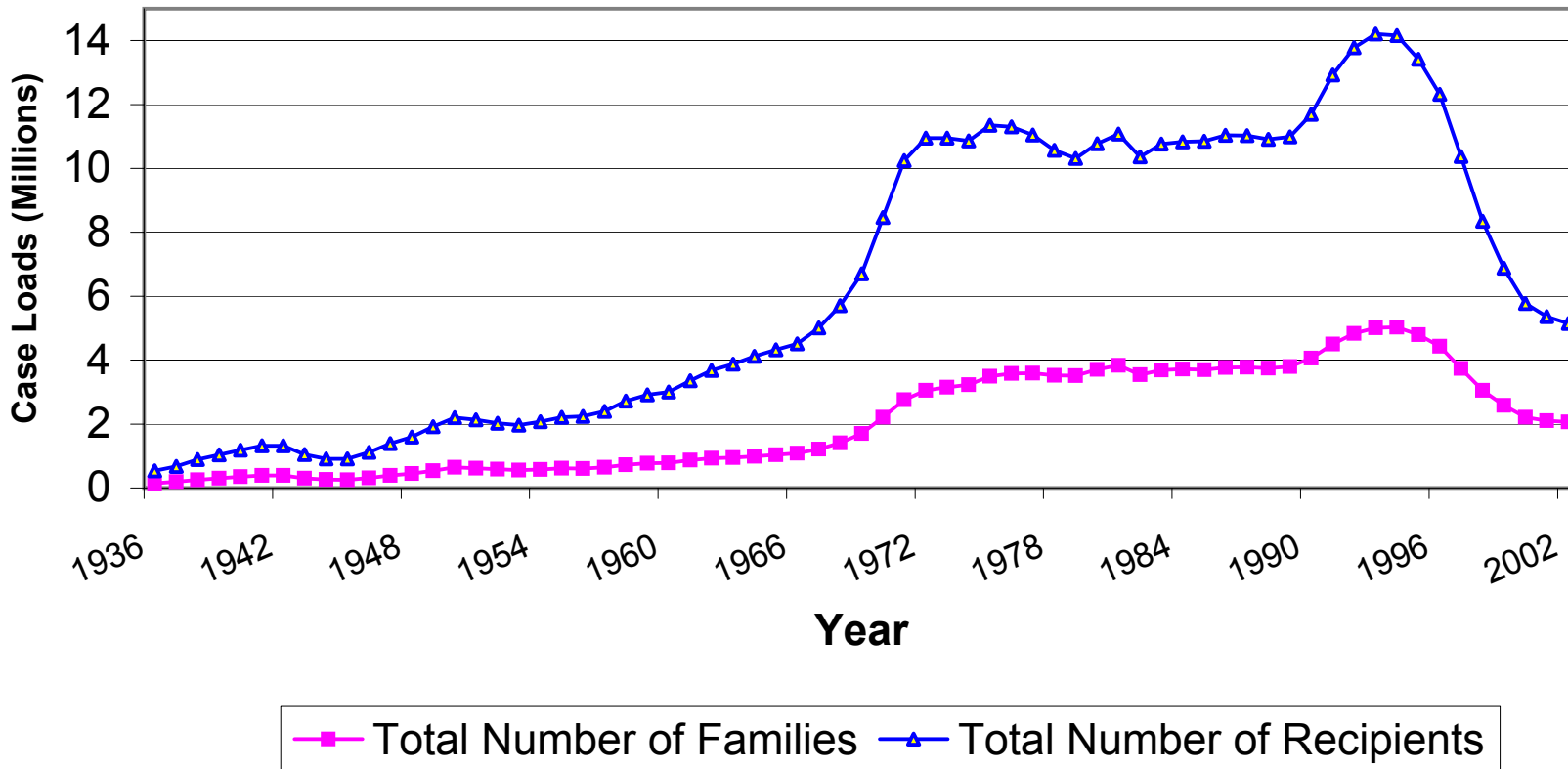
Now we assume that State's fiscal allocation is determined in an adaptive fashion as follows. Suppose that in period t , the State's welfare caseload is given by $F(z - s_t)$, thus the cash welfare expenditure is $zF(z - s_t)$. Then in period $t + 1$, the government will adjust its childcare subsidy s_{t+1} according to

$$s_{t+1} = \frac{B - zF(z - s_t)}{1 - F(z - s_t)}.$$

That is, we assume that the State sets the childcare subsidy for period $t + 1$ to ensure that the MOE spending amount B is satisfied under the myopic assumption that the number of people who work in period $t + 1$ will remain the same as period t . While we do not have direct evidence for this particular specification of the fiscal dynamics, it is certainly plausible. Under reasonable assumptions on the shape of F , the system will have two equilibria, and only the one with the higher level of childcare subsidy is stable. Therefore, under the MOE requirement clause, any initial shock experienced by the economy, such as the booming macro economy in 1996, will lead the system to converge to an equilibrium with a high childcare subsidy and low welfare participation. This equilibrium Pareto dominates the other equilibrium with low childcare subsidy and high welfare participation (see Figure B2).

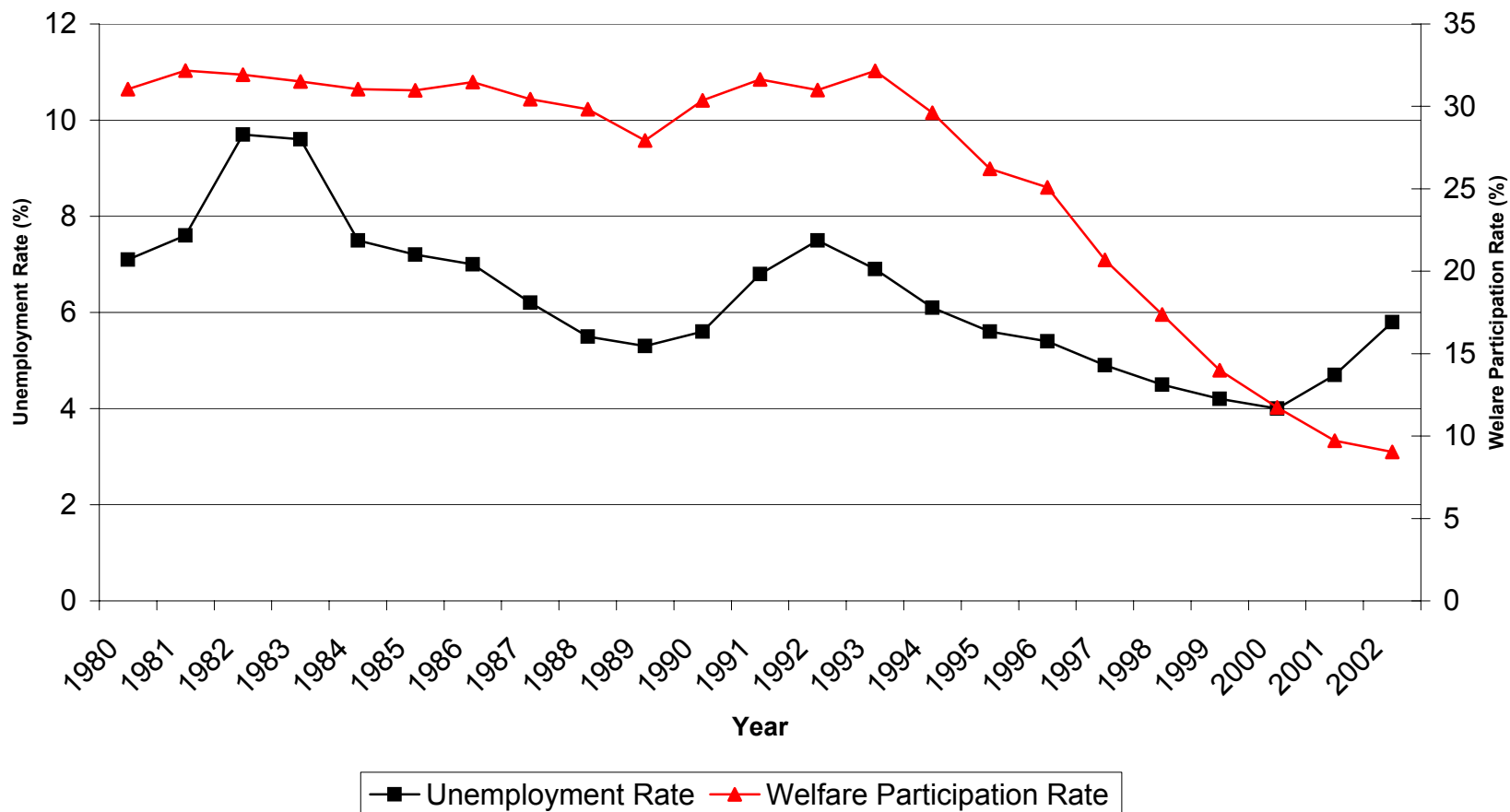
[Figure B2 About Here]

Figure 1: Monthly Number of Families and Recipients On AFDC/TANF 1936-2002



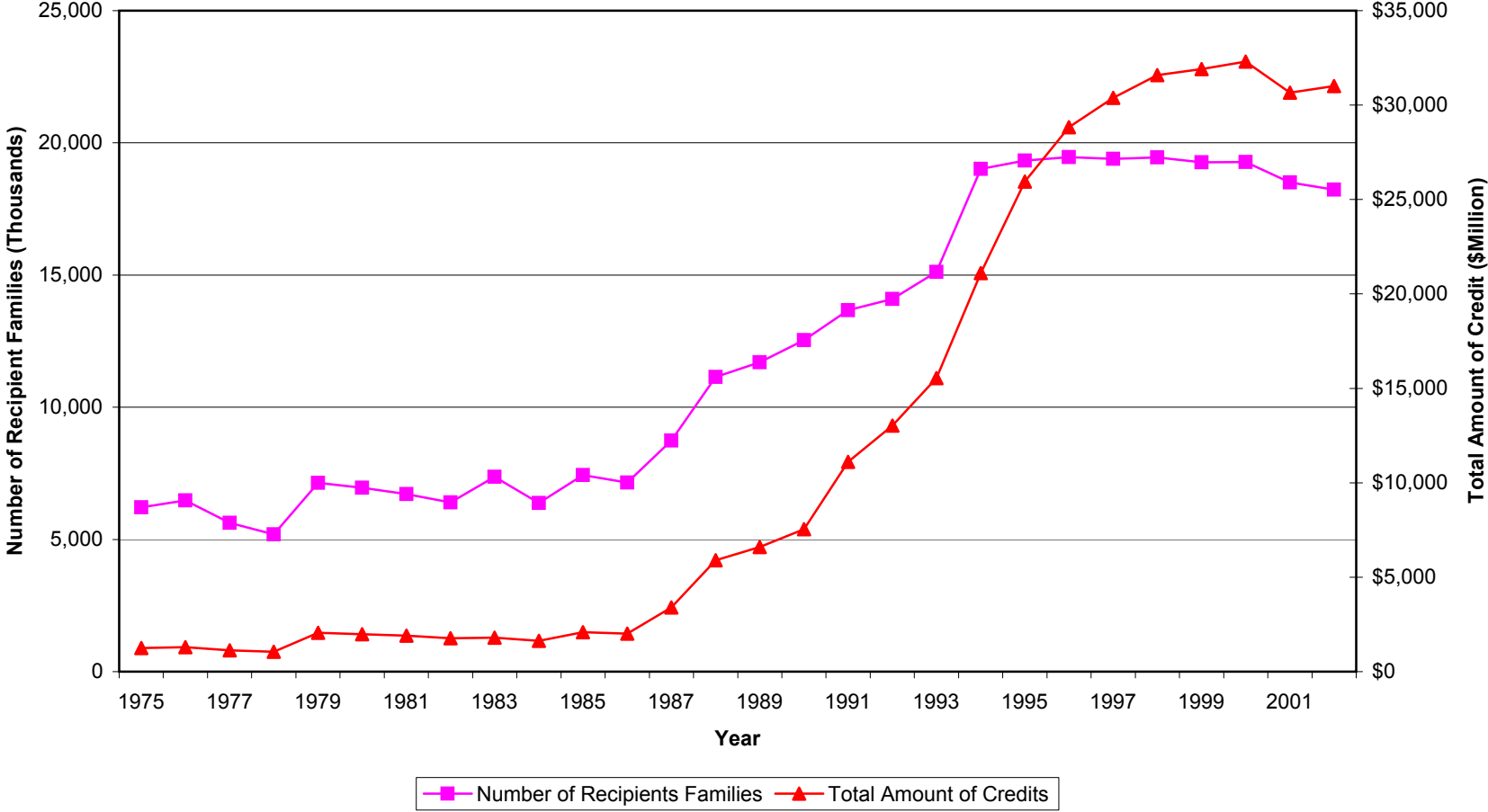
Source: Administration for Children and Families, Department of Health and Human Services.

Figure 2: National Unemployment Rates and Welfare Participation Rates of Single Mothers: 1980-2003



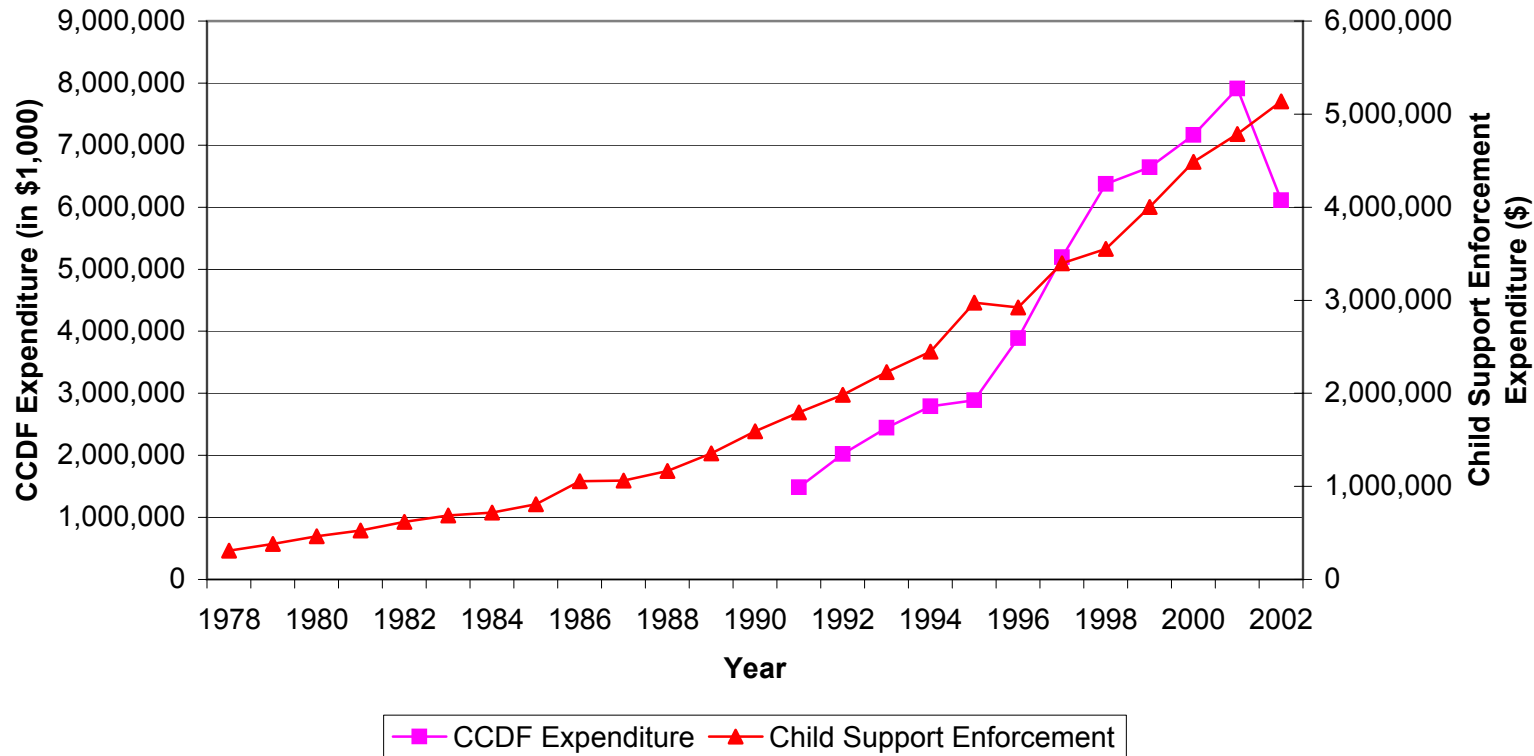
Source: National unemployment rates are from BLS. Welfare participation rates are calculated by the authors from March CPS.

Figure 3: Number of Federal EITC Recipient Families and Total Amount of Credit: 1975-2002



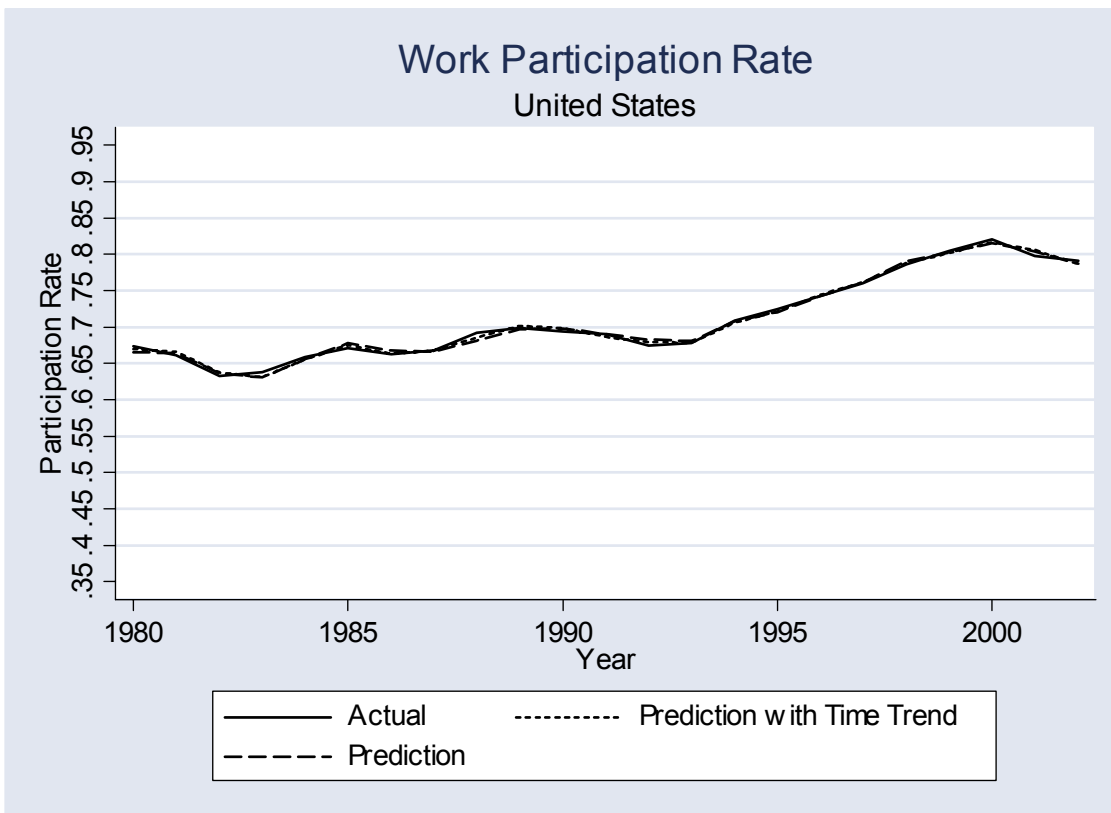
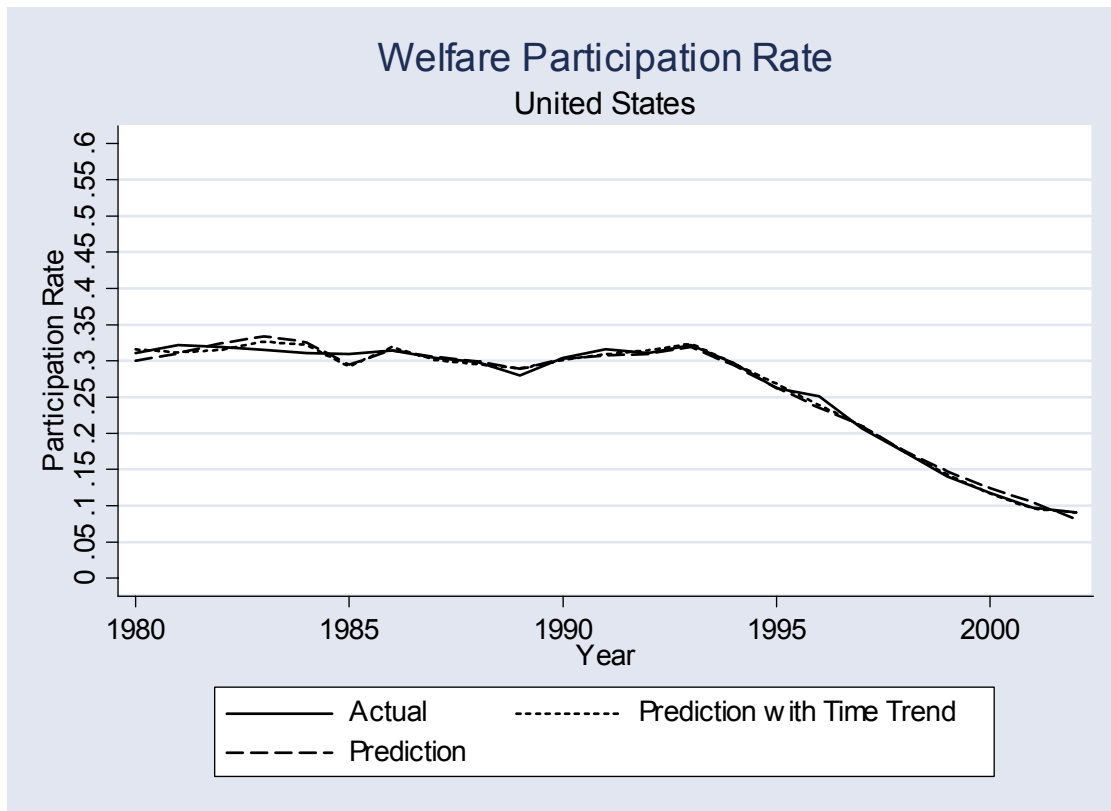
Source: Internal Revenue Service: Various Years.

Figure 4. Total CCDF and Child Support Enforcement Expenditures



Source: Department of Health and Human Services.

Figure 5: Welfare and Work Participation Rates Fit: U.S. Overall.*



* The same legends are used in all subsequent figures.

Figure 6: Welfare Participation Rates Fit: By States.

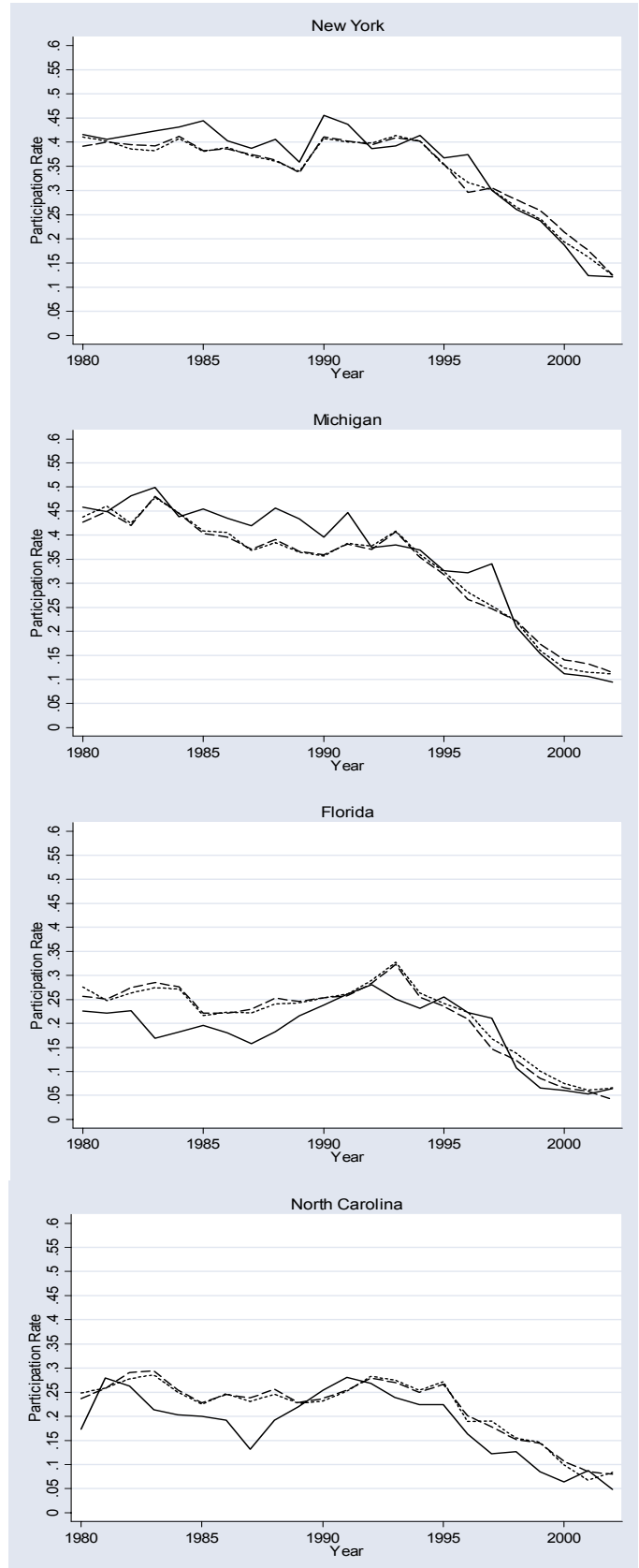
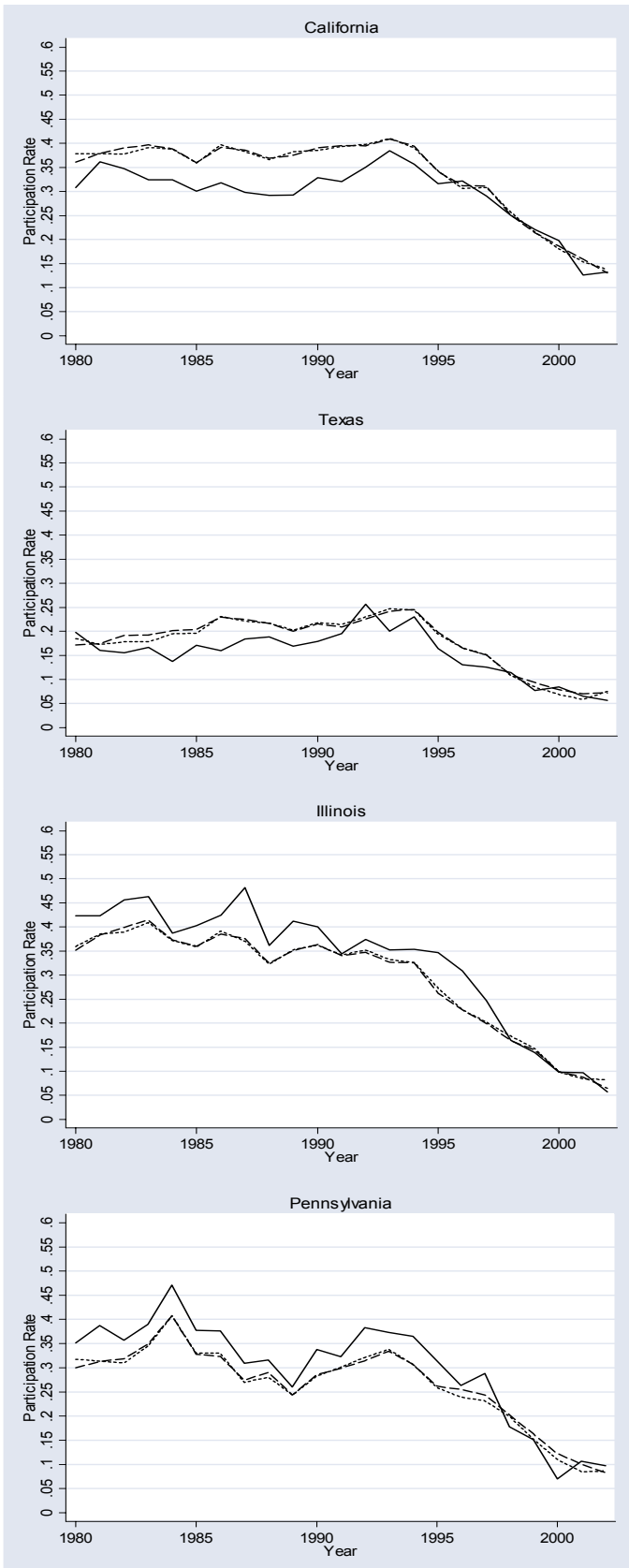


Figure 7: Work Participation Rates Fit: By States.

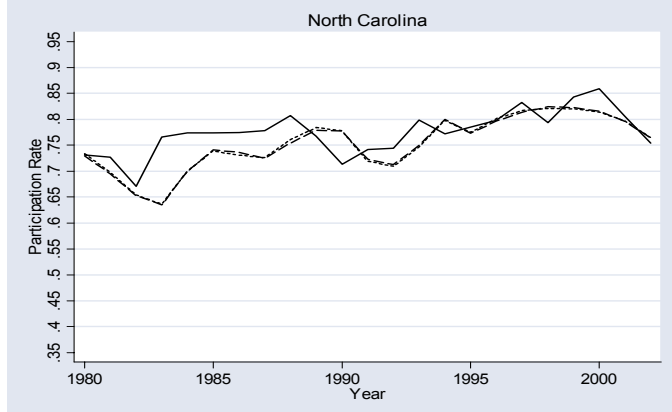
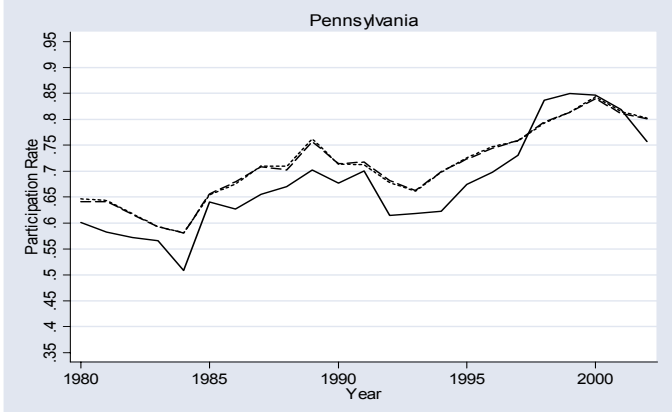
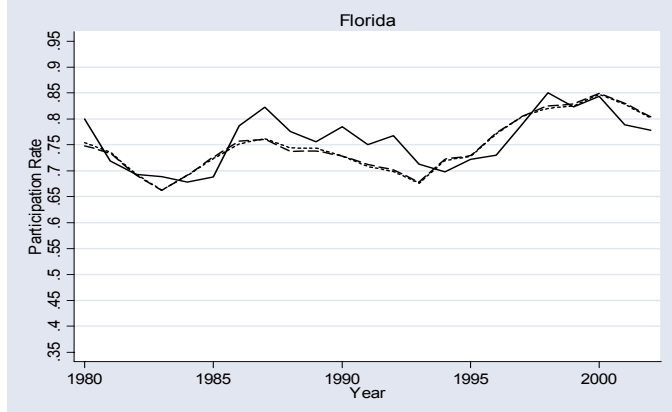
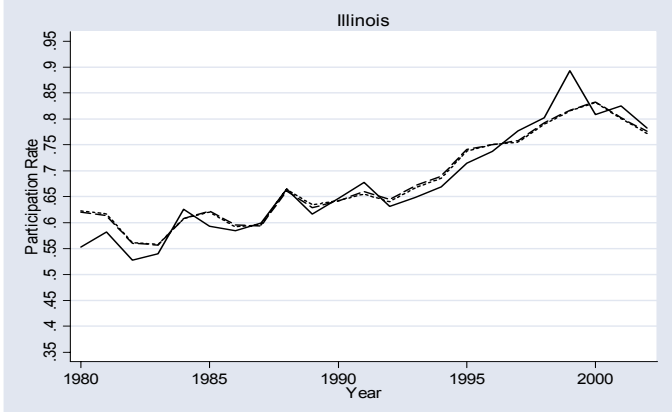
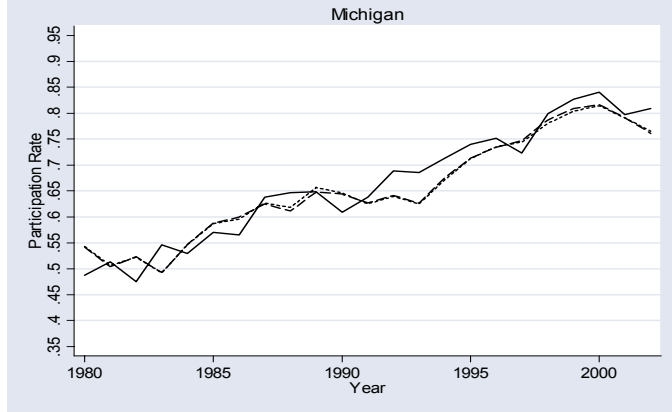
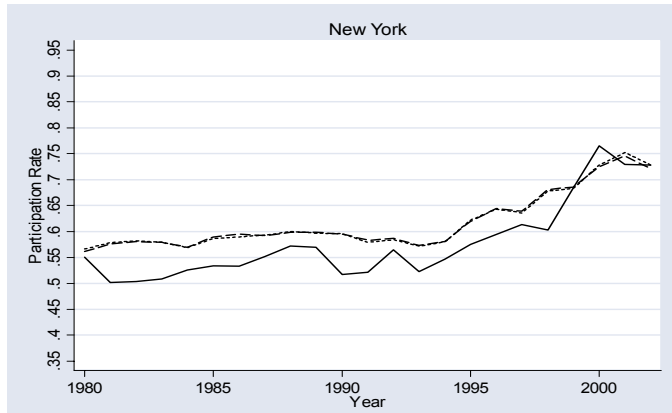
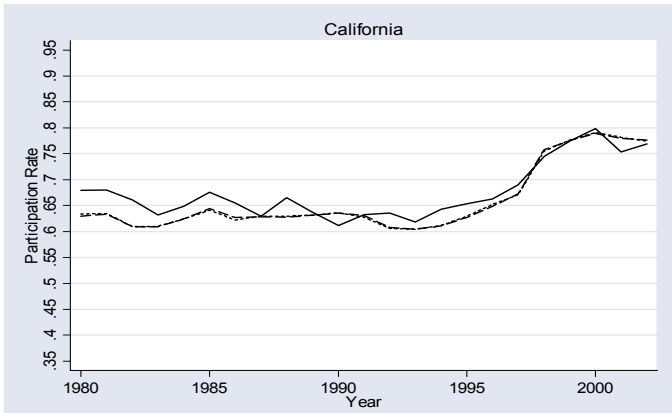


Figure 8: Welfare and Work Participation Rates Fit: By Educational Attainment.

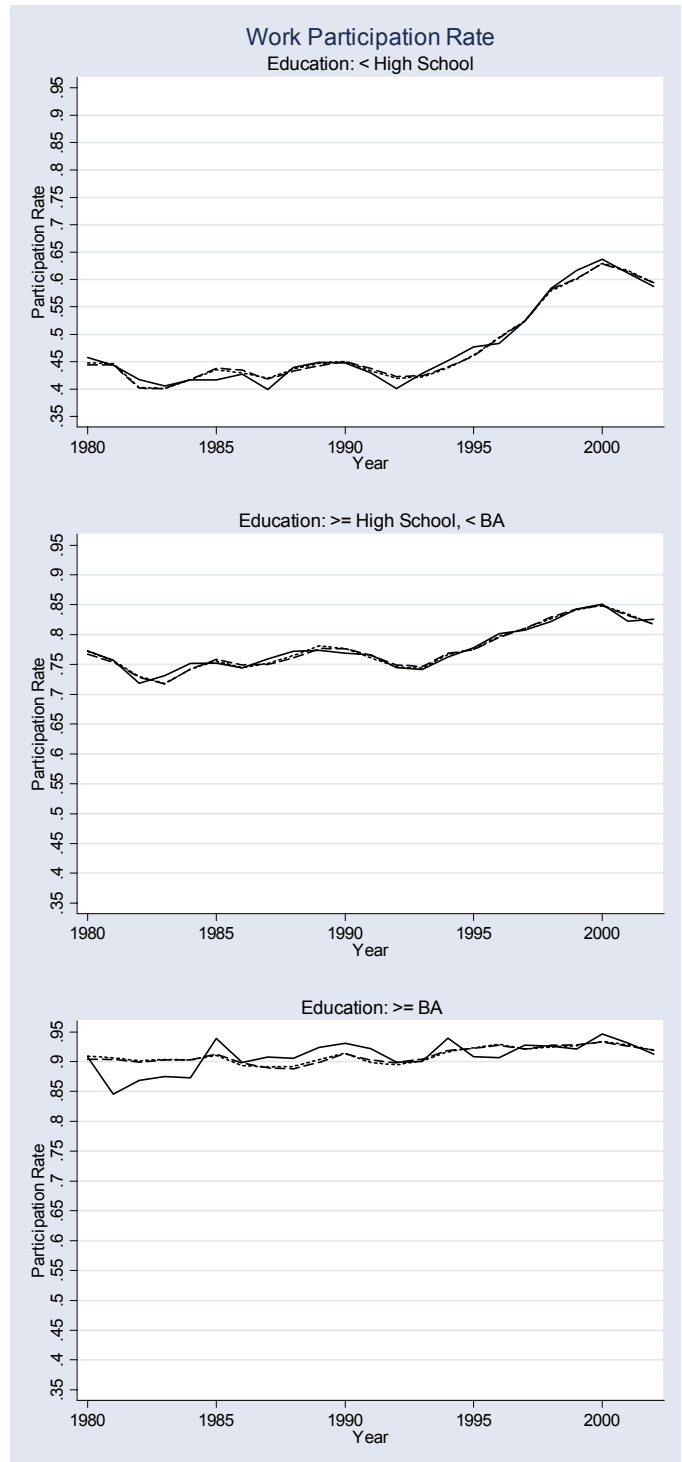
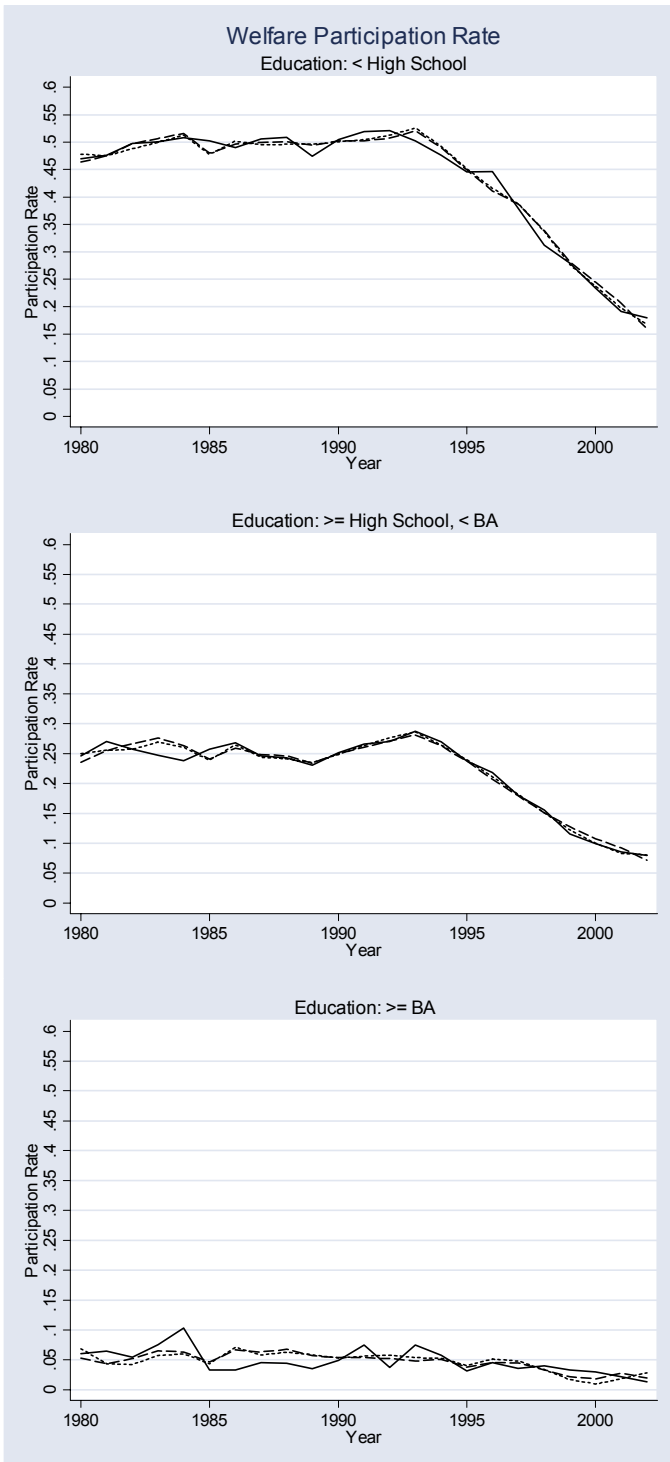


Figure 9: Welfare and Work Participation Rates Fit: By Marital Status.

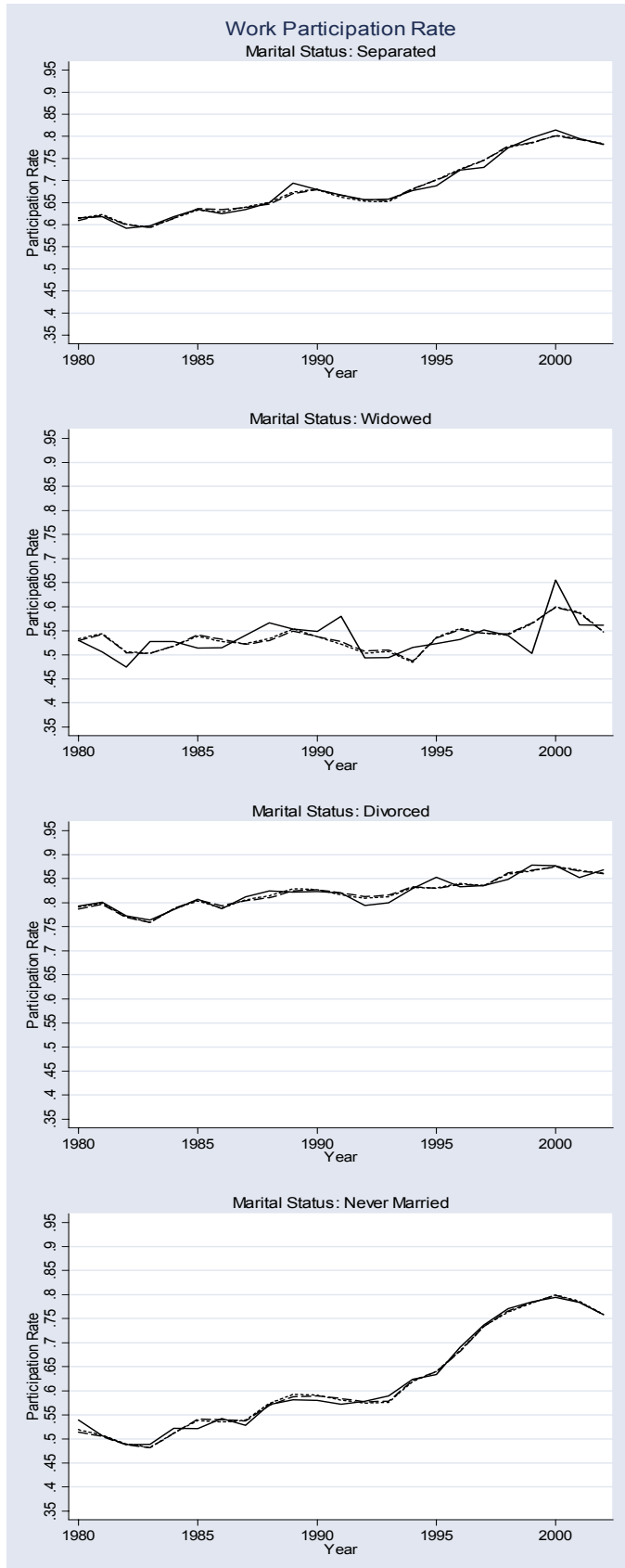
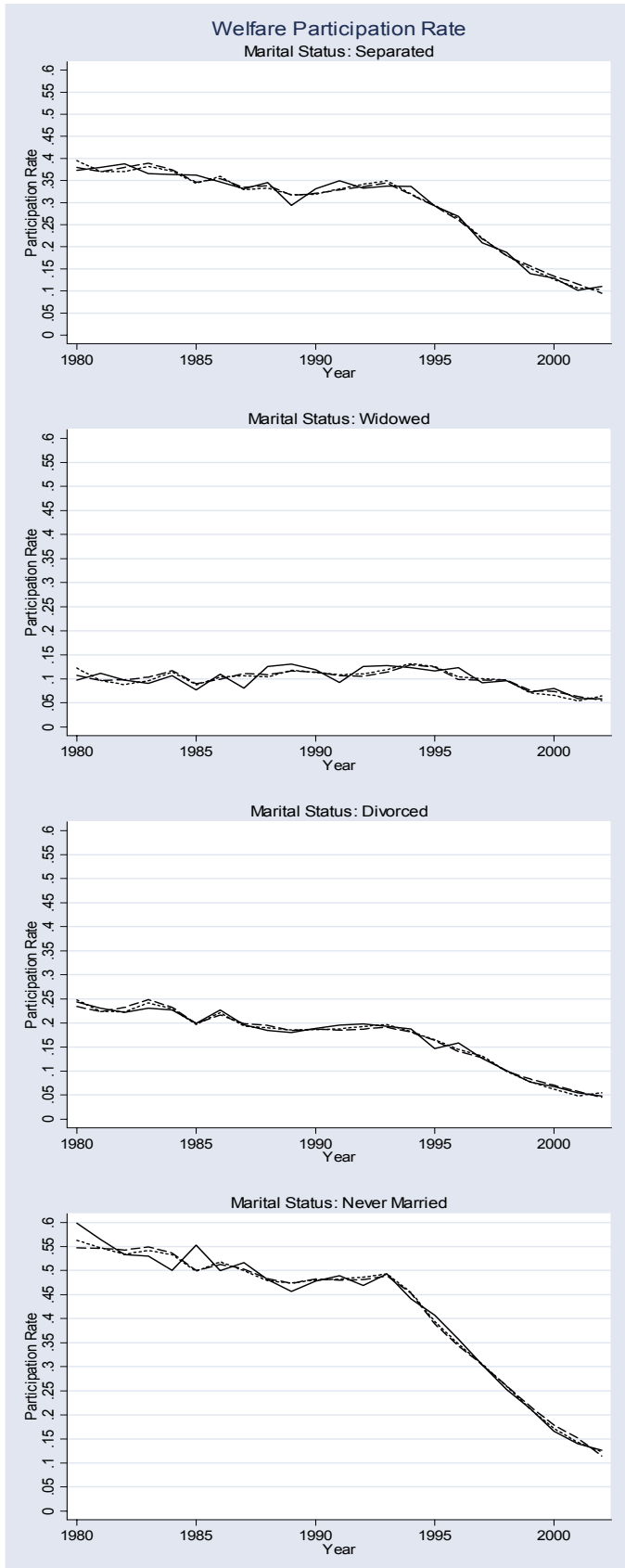


Figure 10: Welfare and Work Participation Rates Fit: By Race.

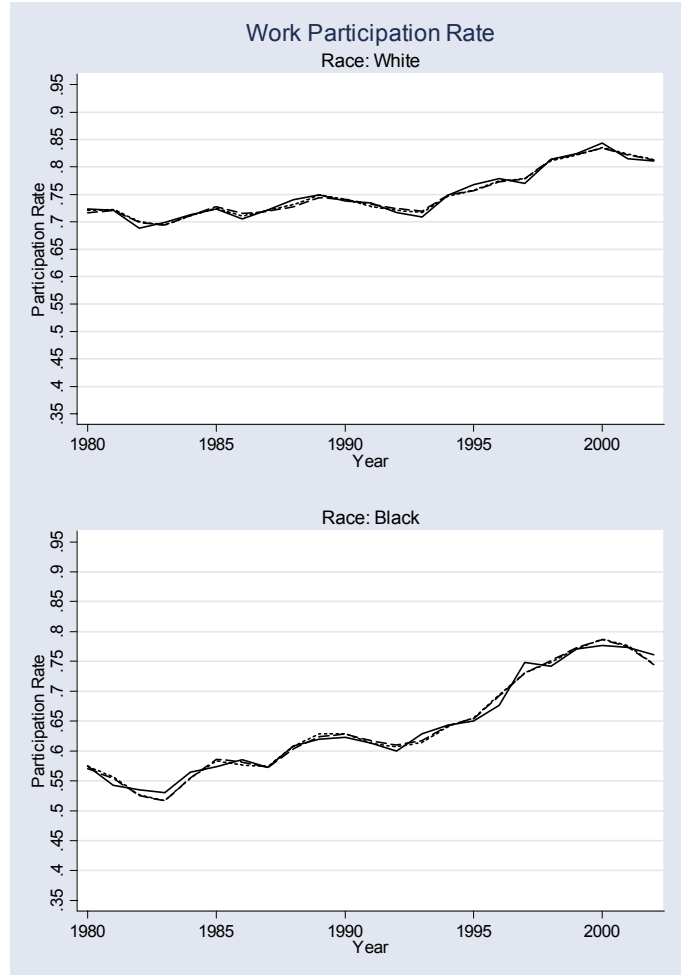
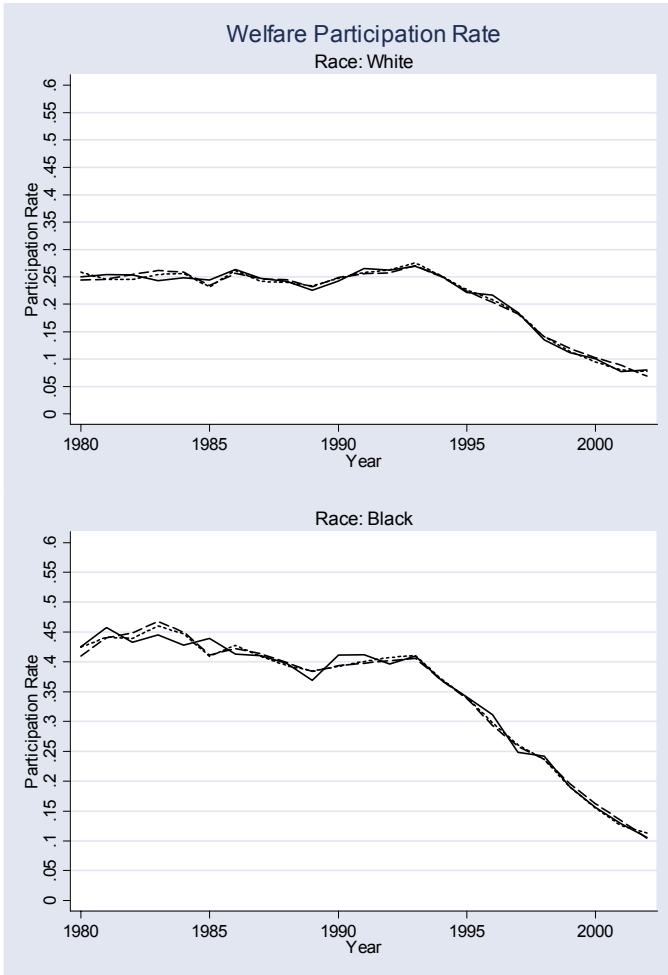


Figure 11: Welfare and Work Participation Rates Fit: By Age of Youngest Child.

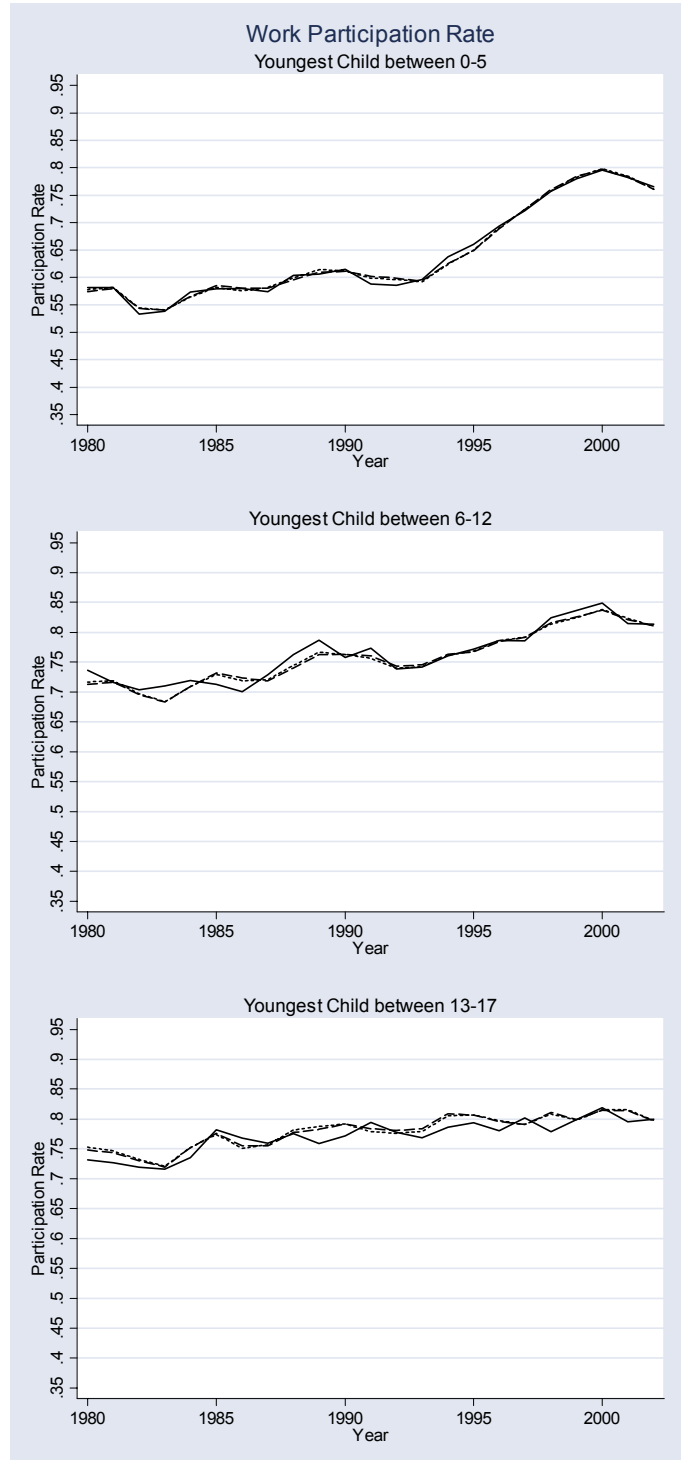
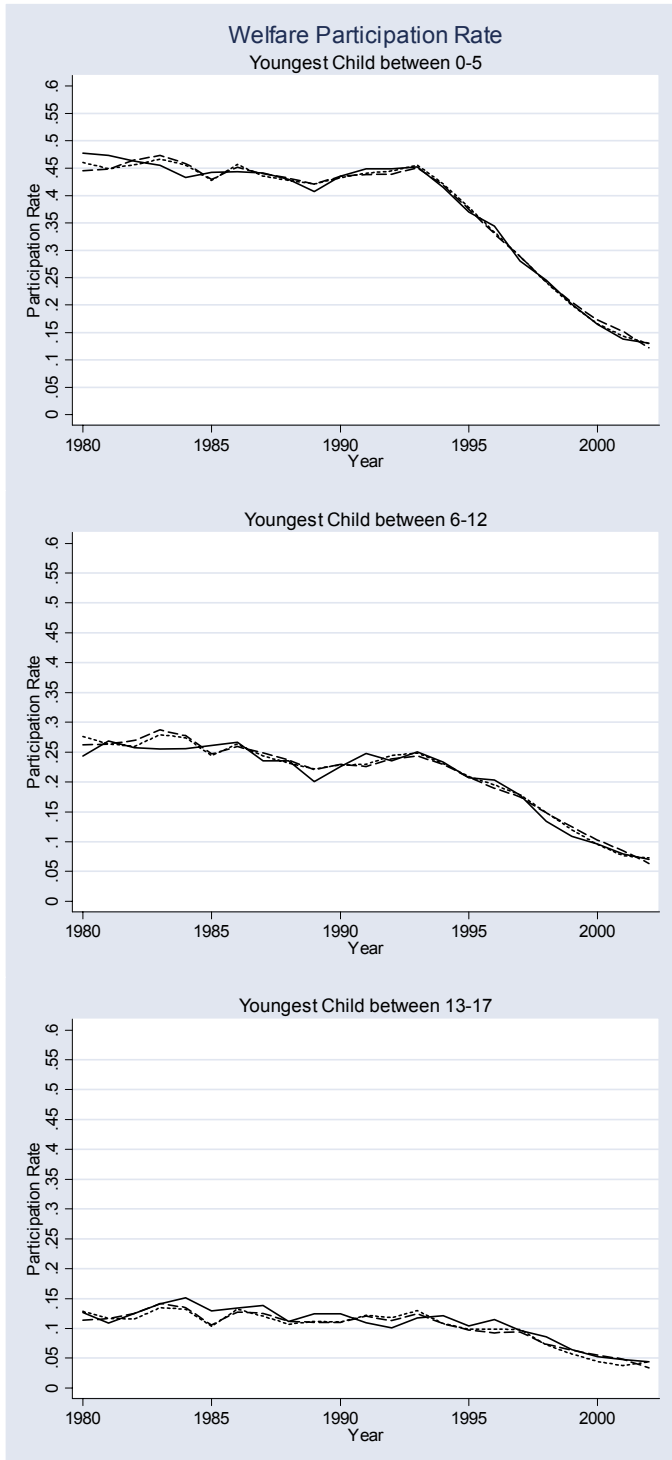


Figure 12: Welfare and Work Participation Rates Fit: By Number of Children.

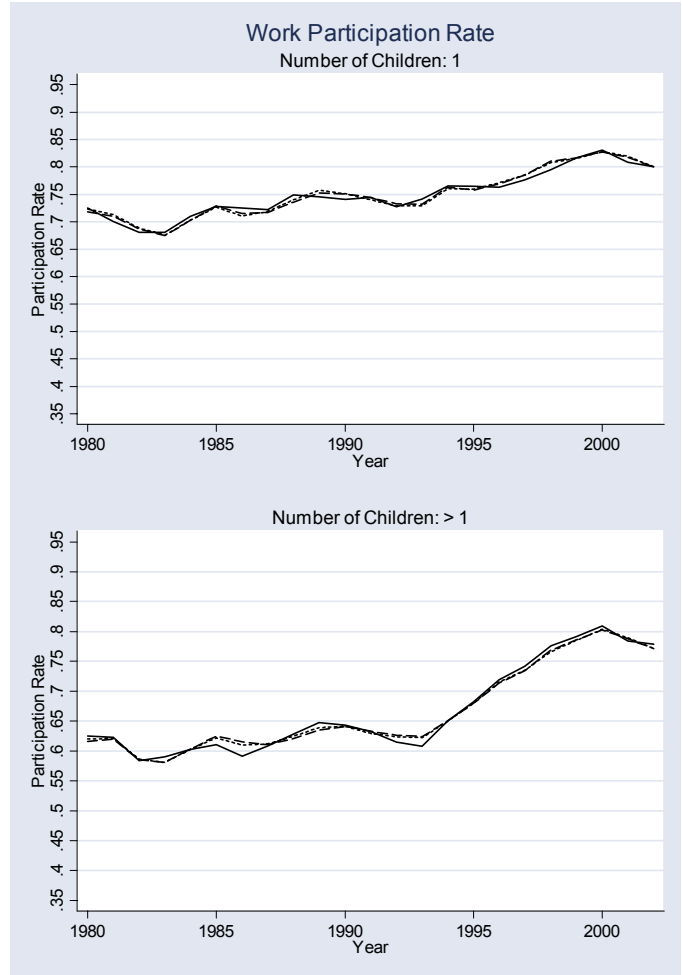
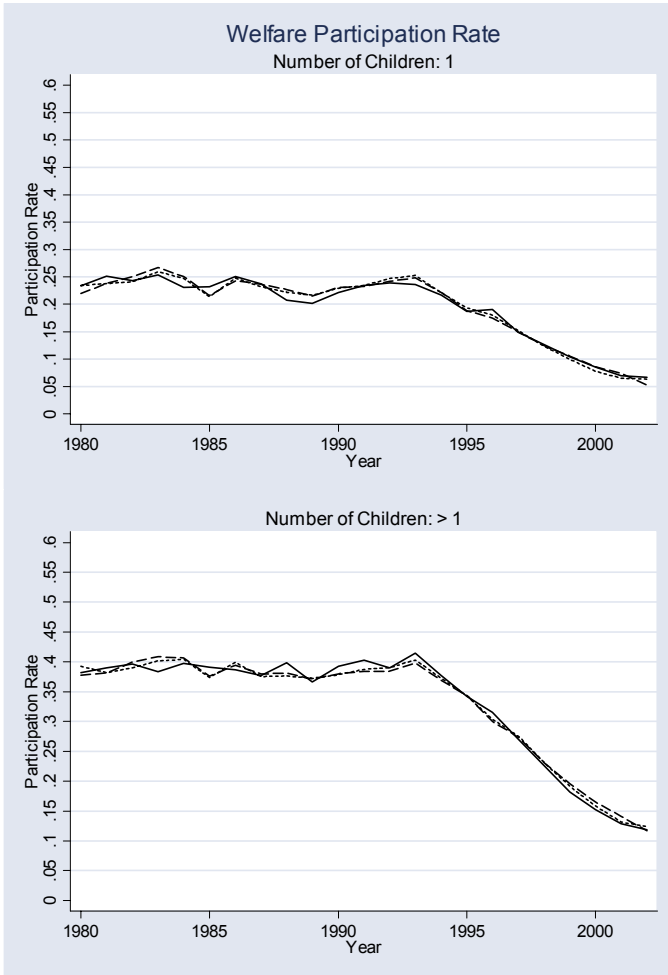


Table 1: Welfare Participation Rates of Single Mothers, By Age of Youngest Child

| Age of Youngest Child | Before Time Limits | After Time Limits | Changes in Percentage Points | Changes in Percent |
|-----------------------|--------------------|-------------------|------------------------------|--------------------|
| 0-6 | 41.3 | 23.8 | -17.5 | -42% |
| 7-12 | 23.1 | 13.3 | -9.8 | -42% |
| 13-17 | 16.0 | 11.0 | -5.0 | -31% |
| All | 32.0 | 18.8 | -13.2 | -41% |

Note: Reproduced from Grogger (2000), Table 2. Data is the March CPS from 1979-1999.

Table 2. Single Mothers: Race, Marital Status, Family Size and Educational Attainment.

| Year | Race (%) | | | Marital Status (%) | | | | Number of Children (%) | | | Educational Attainment (%) | | | |
|------|----------|-------|-------|--------------------|---------|----------|---------------|------------------------|------|------|----------------------------|------|----------------------|------|
| | White | Black | Other | Separated | Widowed | Divorced | Never Married | 1 | 2 | 3+ | HS- | HS | Some Col/Ass. Degree | BA+ |
| 1980 | 64.6 | 33.3 | 2.1 | 24.7 | 13.8 | 46.0 | 15.6 | 48.3 | 31.7 | 20.0 | 34.5 | 39.1 | 19.5 | 7.0 |
| 1981 | 64.9 | 33.0 | 2.1 | 22.8 | 12.0 | 43.9 | 21.3 | 49.1 | 31.3 | 19.6 | 32.8 | 40.3 | 19.2 | 7.7 |
| 1982 | 62.3 | 35.3 | 2.4 | 21.3 | 10.9 | 43.6 | 24.2 | 50.3 | 30.5 | 19.2 | 32.2 | 40.8 | 19.4 | 7.6 |
| 1983 | 63.0 | 34.6 | 2.5 | 20.6 | 10.9 | 44.5 | 24.0 | 52.7 | 29.7 | 17.6 | 31.8 | 41.4 | 19.4 | 7.5 |
| 1984 | 63.6 | 34.1 | 2.3 | 20.0 | 10.6 | 44.3 | 25.1 | 52.4 | 30.8 | 16.9 | 30.6 | 40.1 | 21.4 | 7.9 |
| 1985 | 64.7 | 33.2 | 2.0 | 20.1 | 10.0 | 44.4 | 25.4 | 51.0 | 31.3 | 17.7 | 29.0 | 40.5 | 22.3 | 8.2 |
| 1986 | 64.1 | 33.6 | 2.3 | 19.5 | 9.5 | 43.4 | 27.6 | 53.0 | 30.5 | 16.5 | 29.8 | 40.8 | 20.9 | 8.4 |
| 1987 | 62.8 | 34.3 | 2.9 | 19.4 | 10.0 | 41.4 | 29.2 | 52.0 | 30.1 | 17.9 | 29.1 | 41.0 | 21.2 | 8.8 |
| 1988 | 62.5 | 34.7 | 2.9 | 18.7 | 9.3 | 41.9 | 30.0 | 52.5 | 30.2 | 17.3 | 28.0 | 40.7 | 21.7 | 9.7 |
| 1989 | 62.8 | 34.7 | 2.5 | 19.3 | 9.9 | 41.1 | 29.7 | 52.8 | 30.8 | 16.4 | 26.9 | 41.1 | 23.3 | 8.7 |
| 1990 | 62.3 | 34.9 | 2.8 | 19.0 | 8.3 | 40.3 | 32.4 | 52.1 | 30.5 | 17.4 | 27.8 | 40.2 | 22.8 | 9.1 |
| 1991 | 62.8 | 34.3 | 3.0 | 19.4 | 7.2 | 39.8 | 33.6 | 51.3 | 30.5 | 18.2 | 26.7 | 39.6 | 24.7 | 9.1 |
| 1992 | 62.6 | 34.2 | 3.2 | 18.7 | 6.9 | 40.5 | 33.9 | 52.9 | 30.0 | 17.1 | 24.6 | 39.5 | 26.5 | 9.4 |
| 1993 | 61.8 | 34.7 | 3.6 | 17.9 | 7.0 | 39.4 | 35.7 | 52.2 | 30.3 | 17.6 | 24.8 | 36.7 | 29.4 | 9.1 |
| 1994 | 62.8 | 33.6 | 3.7 | 18.2 | 7.4 | 40.4 | 34.0 | 50.5 | 31.7 | 17.8 | 22.9 | 37.0 | 30.3 | 9.8 |
| 1995 | 64.2 | 32.6 | 3.3 | 18.5 | 6.6 | 40.2 | 34.7 | 51.7 | 30.5 | 17.8 | 22.3 | 36.4 | 30.7 | 10.6 |
| 1996 | 62.8 | 33.7 | 3.5 | 17.2 | 6.0 | 38.9 | 38.0 | 51.6 | 31.4 | 16.9 | 22.0 | 37.6 | 30.3 | 10.1 |
| 1997 | 63.9 | 33.3 | 2.8 | 15.9 | 6.9 | 38.2 | 38.9 | 52.7 | 29.6 | 17.8 | 21.3 | 37.0 | 30.7 | 11.0 |
| 1998 | 63.8 | 33.1 | 3.1 | 15.4 | 6.6 | 38.7 | 39.3 | 52.2 | 30.8 | 17.0 | 20.4 | 35.7 | 31.7 | 12.2 |
| 1999 | 63.6 | 32.5 | 3.9 | 14.4 | 6.4 | 39.1 | 40.2 | 53.7 | 30.4 | 15.9 | 20.7 | 36.8 | 30.8 | 11.7 |
| 2000 | 64.4 | 31.6 | 4.0 | 13.9 | 6.5 | 38.8 | 40.7 | 52.3 | 31.1 | 16.6 | 19.6 | 36.1 | 32.3 | 12.0 |
| 2001 | 64.1 | 31.5 | 4.5 | 14.4 | 6.4 | 38.1 | 41.1 | 53.4 | 30.1 | 16.4 | 18.7 | 36.7 | 31.6 | 13.0 |
| 2002 | 63.1 | 31.8 | 5.1 | 14.4 | 6.5 | 37.8 | 41.3 | 54.5 | 29.0 | 16.6 | 19.3 | 35.4 | 32.7 | 12.6 |

Table 3: Explaining the Discrepancy Between Welfare Participation Rate Drop and Work Participation Rate Increase from 1993 to 2002.

| | 1993 | | 2002 | |
|---------|------------|---------|------------|---------|
| | No Welfare | Welfare | No Welfare | Welfare |
| No Work | 11.35 | 20.86 | 16.43 | 4.51 |
| Work | 56.49 | 11.3 | 74.54 | 4.52 |

Changes from 1993-2002:

| | |
|---------------------------------------|-------|
| Welfare Participation Rate Drop: | 23.13 |
| Work Participation Rate Increase: | 11.27 |
| Discrepancy: | 11.86 |
| Decrease in "Work and Welfare": | 6.78 |
| Increase in "No Work and No Welfare": | 5.08 |
| Total: | 11.86 |

Source: Authors' Calculations from March CPS.

Table 4a: Single Mothers' Real Incomes: Total Income, Sources and EITC (in Year 2001 Dollars).

| Year | Total Income | Wage Income | Public Assistance | Food Stamps | Alimony* | Child Support* | Unemp. Compensation** | Worker's Compensation** | Suppl. Security | Social Security | EITC |
|------|--------------|-------------|-------------------|-------------|----------|----------------|-----------------------|-------------------------|-----------------|-----------------|---------|
| 1980 | 18468.2 | 12530.4 | 1982.6 | 910.5 | 1543.7 | .. | 331.0 | .. | 153.3 | 954.0 | 216.77 |
| 1981 | 17360.4 | 11650.5 | 1903.2 | 812.6 | 1618.1 | .. | 302.8 | .. | 123.8 | 894.6 | 189.49 |
| 1982 | 17028.6 | 11503.2 | 1839.7 | 843.8 | 1472.7 | .. | 329.0 | .. | 124.3 | 887.0 | 156.74 |
| 1983 | 17006.8 | 11630.5 | 1789.6 | 837.6 | 1414.2 | .. | 337.5 | .. | 121.5 | 833.3 | 138.77 |
| 1984 | 17486.4 | 12199.8 | 1767.9 | 794.5 | 1431.5 | .. | 250.6 | .. | 122.3 | 699.0 | 135.84 |
| 1985 | 18278.3 | 12720.6 | 1752.7 | 774.6 | 1559.2 | .. | 233.3 | .. | 130.9 | 719.3 | 155.73 |
| 1986 | 18002.6 | 12745.6 | 1794.2 | 794.0 | 1407.9 | .. | 190.5 | .. | 152.9 | 643.7 | 147.61 |
| 1987 | 18956.2 | 13330.9 | 1679.9 | 818.0 | 197.8 | 1159.7 | 79.1 | 46.4 | 194.5 | 699.4 | 266.13 |
| 1988 | 18676.8 | 13384.9 | 1569.7 | 768.1 | 256.1 | 1081.0 | 85.0 | 45.3 | 161.7 | 648.2 | 356.07 |
| 1989 | 19442.1 | 13871.4 | 1470.9 | 757.6 | 229.9 | 1155.2 | 100.9 | 58.9 | 143.8 | 703.5 | 359.61 |
| 1990 | 18700.8 | 13301.6 | 1536.4 | 868.7 | 178.3 | 1139.7 | 111.6 | 95.7 | 193.6 | 608.5 | 354.34 |
| 1991 | 18522.4 | 13353.6 | 1583.0 | 927.9 | 148.2 | 1240.1 | 136.2 | 74.8 | 188.1 | 564.4 | 449.26 |
| 1992 | 18396.0 | 13326.8 | 1447.0 | 908.5 | 112.0 | 1253.6 | 172.7 | 62.8 | 222.8 | 637.4 | 481.35 |
| 1993 | 18498.4 | 13065.5 | 1528.9 | 921.3 | 118.1 | 1208.0 | 159.7 | 51.5 | 296.3 | 727.3 | 519.03 |
| 1994 | 19271.7 | 13932.0 | 1400.6 | 947.6 | 124.3 | 1253.2 | 152.9 | 80.0 | 292.4 | 773.2 | 796.39 |
| 1995 | 20162.6 | 14627.5 | 1212.1 | 850.3 | 103.2 | 1318.4 | 128.7 | 77.5 | 360.7 | 735.4 | 950.12 |
| 1996 | 20280.0 | 15153.1 | 1036.0 | 801.7 | 132.7 | 1334.4 | 120.9 | 41.7 | 338.0 | 720.5 | 1074.46 |
| 1997 | 20324.9 | 15210.4 | 802.5 | 719.9 | 157.9 | 1272.8 | 106.5 | 41.8 | 331.5 | 794.0 | 1116.82 |
| 1998 | 21468.2 | 16535.1 | 647.1 | 612.0 | 134.9 | 1331.8 | 103.1 | 41.5 | 297.0 | 636.0 | 1175.87 |
| 1999 | 22440.9 | 17285.2 | 509.8 | 505.9 | 203.7 | 1472.1 | 91.2 | 58.7 | 260.7 | 686.6 | 1179.53 |
| 2000 | 23164.4 | 18338.7 | 400.9 | 449.3 | 130.1 | 1494.5 | 99.5 | 56.3 | 285.7 | 597.3 | 1151.16 |
| 2001 | 23885.1 | 18739.5 | 306.8 | 442.8 | 170.3 | 1531.5 | 166.0 | 46.6 | 277.7 | 668.1 | 1104.65 |
| 2002 | 23068.3 | 18225.9 | 301.5 | 499.1 | 154.8 | 1475.4 | 277.9 | 55.2 | 273.6 | 676.6 | 1088.48 |

Note: Total income includes the (imputed) cash value of the food stamps. It does not include the EITC amount because the survey did not ask if individuals filed for EITC. The EITC amount is simulated from federal and State EITC rules.

*: Previous to 1987 Alimony and Child Support were recorded jointly.

** : Previous to 1987, income from unemployment and worker's compensation, veterans' payments, and government pensions were recorded jointly.

Source: Authors' Calculations from March CPS 1981-2003.

Table 4b: Single Mothers' Living Conditions, Working Hours and Wages

| Year | Public Housing | Cohabitation | Hourly Wage if Work (\$)* | Hourly Wage if Full Time Work (\$)* | Average Hours/Week if Work | Average Hours/Week if Full Time Work |
|------|----------------|--------------|---------------------------|-------------------------------------|----------------------------|--------------------------------------|
| 1980 | 8.7% | 13.7% | 10.93 | 11.34 | 37.69 | 40.95 |
| 1981 | 9.0% | 19.0% | 10.33 | 10.80 | 37.59 | 40.82 |
| 1982 | 10.3% | 22.4% | 10.75 | 11.07 | 37.60 | 40.90 |
| 1983 | 10.2% | 22.6% | 10.90 | 11.52 | 37.36 | 41.05 |
| 1984 | 11.2% | 22.6% | 10.79 | 11.30 | 37.49 | 40.98 |
| 1985 | 10.9% | 21.9% | 11.02 | 11.52 | 37.49 | 41.20 |
| 1986 | 11.1% | 22.4% | 11.14 | 11.54 | 37.58 | 41.19 |
| 1987 | 10.8% | 28.5% | 11.20 | 11.71 | 38.09 | 41.24 |
| 1988 | 10.1% | 27.7% | 10.96 | 11.57 | 37.67 | 41.31 |
| 1989 | 10.0% | 28.6% | 11.29 | 11.85 | 38.30 | 41.60 |
| 1990 | 10.2% | 29.2% | 11.46 | 11.61 | 37.98 | 41.37 |
| 1991 | 10.4% | 31.2% | 11.09 | 11.64 | 37.78 | 41.47 |
| 1992 | 10.2% | 31.1% | 11.19 | 12.00 | 37.84 | 41.39 |
| 1993 | 11.4% | 30.5% | 11.16 | 11.53 | 37.64 | 41.49 |
| 1994 | 9.8% | 31.9% | 11.28 | 11.94 | 37.86 | 41.56 |
| 1995 | 10.0% | 31.8% | 11.48 | 11.89 | 38.09 | 41.82 |
| 1996 | 11.1% | 31.2% | 11.73 | 12.20 | 37.87 | 41.53 |
| 1997 | 10.3% | 32.1% | 11.62 | 11.97 | 37.89 | 41.53 |
| 1998 | 10.4% | 31.4% | 11.93 | 12.37 | 38.41 | 41.59 |
| 1999 | 10.0% | 32.5% | 12.26 | 12.69 | 38.45 | 41.44 |
| 2000 | 9.7% | 33.2% | 12.47 | 12.80 | 38.46 | 41.58 |
| 2001 | 9.4% | 31.2% | 13.00 | 13.43 | 38.49 | 41.45 |
| 2002 | 9.4% | 31.9% | 12.88 | 13.23 | 38.27 | 41.45 |

*: in Year 2001 Dollar.

Source: Authors' Calculations from March CPS 1981-2003.

Table 5. Summary of Variables.

| Variables | Explanation |
|--|---|
| Dependent Variables (DV) | |
| $WEL_RECEIPT_{ist}$: | Categorical variable indicating whether i received welfare; |
| $WORK_{ist}$: | Categorical variable indicating whether i worked at least part time; |
| Individual Level Demographic Variables (DEM) | |
| AGE_{ist} : | Age (continuous variable); |
| $RACE_{ist}$: | Race (categorical variable, White, Black or Other); |
| EDU_{ist} : | Educational attainment (categorical variable); |
| $MARITAL_{ist}$: | Marital status (categorical variable); |
| $URBAN_{ist}$: | Urban/rural of residence (categorical variable); |
| $NCHILD05_{ist}, NCHILD612_{ist}, NCHILD1317_{ist}$: | Number of children younger than 6, between 6 and 12, respectively; |
| $DCHILD05_{ist}, DCHILD612_{ist}$: | Dummy variable indicating whether the woman has any child below 6 or between 6 and 12; |
| $YOUNGEST_{ist}, OLDEST_{ist}$: | Ages of the youngest and oldest child, respectively |
| Individual Level Policy Variables (PV-IND) | |
| $WELFARE_BEN_{ist}$: | Real AFDC or TANF maximum benefits (assuming zero earnings), calculated using the state level benefit rule and the mother's family composition |
| $FOOD_STAMP_{ist}$: | Real Food Stamp benefits (taking into account that welfare benefits counts toward income); |
| $EITC_RATE_{ist},$ $EITC_MAX_{ist}$: | EITC phase in rate, and maximum EITC credit amount (real), constructed from both the federal and state level EITC rules, together with the mother's family composition; |
| $INC_EXEMPTION_{ist}$: | Exemption amount for federal income tax (constructed from personal exemption times the number of people in the family plus the standard deduction); |
| SWR_{ist} : | Fraction of year t woman i may be <i>subject to the State's work requirement</i> (constructed from States' work requirement time limit, child age exemption, and woman's family composition); |
| DTL_HIT_{ist} : | Dummy variable indicating whether a woman would have hit time limit; |
| $MONTH_SINCE_TL_HIT_{ist}$: | Time elapsed since woman i may potentially be subject to time limit; |
| $MONTH_SINCE_WR_HIT_{ist}$: | Cumulative time elapsed since the woman may potentially be subject to work requirement; |
| $REMAINING_TL_ELIG_{ist}$: | Maximum potential remaining length of a woman's time limit, constructed by: $TL_LENGTH_{st} - \min\{MONTH_SINCE_TL_START_{st}, OLDEST_{ist} \times 12\}$; |
| $REMAINING_CHILD_ELIG_{ist}$: | Remaining length of time to be categorically eligible for welfare benefits, constructed from $18 - YOUNGEST_{ist}$; |
| $MEDICAID_PCT_{ist}$: | Percentage of children covered by Medicaid expansion. Constructed from woman's family composition and her state's Medicaid and/or S-CHIP expansion. |
| $MEDICAID_FPL_{ist}$: | Medicaid expansion eligibility income threshold for the youngest child of the woman. |
| State Level Policy and Economic Variables (PV-ST) | |
| DTL_{st} : | Dummy for whether state s has time limit in place at year t either under waiver or TANF; |
| TL_LENGTH_{st} : | Length of the time limit in state s ; |

| | |
|----------------------------------|--|
| $MONTH_SINCE_TL_START_{st}$: | Time (in months) elapsed since the implementation of time limits (either waiver or TANF); |
| $DCHILDBEN_{st}$: | Dummy variable indicating whether the child portion of the welfare benefit continues after time limits exhaustion; |
| $FLAT_DISREGARD_{st}$: | Flat amount of earnings disregarded in calculating the AFDC/TANF benefit levels; |
| BBR_{st} : | Benefit reduction rate (incorporates “permanent” percent income disregard); |
| $DWORKREQ_{st}$: | Dummy for whether state s has work requirement in place at year t either under waiver or TANF; |
| $LENGTH_WR_TL_{st}$: | Length of work requirement time limit in state s in year t ; |
| $MONTH_SINCE_WR_START_{st}$: | Time (in months) elapsed since the implementation of work requirement time limits (either waiver or TANF); |
| $CHILD_EXEMP_AGE_{st}$: | The age of youngest children below which the mother will be exempted from work requirement; |
| $N_WR_EXEMPTION_{st}$: | Number of work requirement exemptions; |
| $DFULLSANCTION_{st}$: | Dummy variable: 1 if the state has an ultimate full sanction whether work requirement is not satisfied; |
| $CHILDSUPPORT_ENFORCE_{st}$: | Child support enforcement expenditure in state s at year t per single mother; |
| $CHILDCARE_{st}$: | Total child care subsidy expenditure in state s at year t per single mother; |
| $WAGE20_{st}$: | Real hourly wage rate at the 20 percentile of the wage distribution in state s at year t ; |
| $UNEMPLOYMENT_{st}$: | State unemployment rate; |
| $DIVERSION_{st}$: | Dummy for whether state s has a diversion program; |

Federal Level Policy Variables (PV-FED)

| | |
|------------------|---|
| MIN_WAGE_t : | Real federal minimum hourly wage rate; |
| $INCTAX_RATE_t$ | Lowest bracket federal income tax rate. |

Table 6: Summary of Interaction Terms in Empirical Specification.

| Policy Variables | Interaction Terms |
|---|---|
| Policy Variables Related to Time Limits: | |
| DTL_{st} : | TL_LENGTH_{st} ; DTL_HIT_{ist} ; $DCHILD BEN_{st}$; |
| $REMAINING_TL_ELIG_{ist}$: | $WELFARE_BEN_{ist}$; $WELFARE_BEN_{ist} \times EDU_{ist}$; $AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$ $REMAINING_CHILD_ELIG_{ist}$; $[REMAINING_CHILD_ELIG_{ist} \times WELFARE_BEN_{ist}]$; $[REMAINING_CHILD_ELIG_{ist} \times WELFARE_BEN_{ist} \times EDU_{ist}]$; $[REMAINING_CHILD_ELIG_{ist} \times AGE_{ist}]$; $[REMAINING_CHILD_ELIG_{ist} \times MARITAL_{ist}]$; $[REMAINING_CHILD_ELIG_{ist} \times EDU_{ist}]$; $[REMAINING_CHILD_ELIG_{ist} \times RACE_{ist}]$; $[REMAINING_CHILD_ELIG_{ist} \times UNEMPLOYMENT_{st}]$; $[REMAINING_CHILD_ELIG_{ist} \times UNEMPLOYMENT_{s(t-1)}]$ |
| $MONTH_SINCE_TL_START_{st}$: | $AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$ |
| $MONTH_SINCE_TL_HIT_{ist}$: | $[AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}]$ |
| Policy Variables Related to Work Requirements: | |
| $DWORKREQ_{st}$: | $LENGTH_WR_TL_{st}$ |
| SWR_{ist} : | $AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$, $[NCHILD05_{ist}, NCHILD612_{ist}]$ $[WELFARE_BEN_{ist}, WELFARE_BEN_{ist} \times EDU_{ist}]$, $DFULLSANCTION_{st}, N_WR_EXEMPTION_{st}$, $[UNEMPLOYMENT_{st}, UNEMPLOYMENT_{s(t-1)}]$ |
| $MONTH_SINCE_WR_START_{st}$: | $[AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}]$ |
| $MONTH_SINCE_WR_HIT_{ist}$: | $AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$ |
| Policy Variables Related to EITC: | |
| $EITC_RATE_{ist}$, | $[WAGE20_{st}, UNEMPLOYMENT_{st}, UNEMPLOYMENT_{s(t-1)}]$, |
| $EITC_MAX_{ist}$: | $[SWR_{ist}, DTL_{st}]$, $AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$ |
| Policy Variable Related to Child Care: | |
| $CHILDCARE_{st}$: | $NCHILD05_{ist}, NCHILD612_{ist}, AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$ $[UNEMPLOYMENT_{st}, UNEMPLOYMENT_{s(t-1)}]$ $DCHILD05_{ist} \times AGE_{ist}, DCHILD05_{ist} \times MARITAL_{ist}$, $DCHILD05_{ist} \times EDU_{ist}, DCHILD05_{ist} \times RACE_{ist}$, $[DCHILD05_{ist} \times UNEMPLOYMENT_{st}]$, $[DCHILD05_{ist} \times UNEMPLOYMENT_{s(t-1)}]$ $DCHILD612_{ist} \times AGE_{ist}, DCHILD612_{ist} \times MARITAL_{ist}, DCHILD612_{ist} \times EDU_{ist}$, $DCHILD612_{ist} \times RACE_{ist}$, $[DCHILD612_{ist} \times UNEMPLOYMENT_{st}, DCHILD612_{ist} \times UNEMPLOYMENT_{s(t-1)}]$ |

Policy Variables Related to AFDC/TANF Benefit Levels:

$WELFARE_BEN_{ist}$: $[WAGE_{20_{st}}, UNEMPLOYMENT_{st}, UNEMPLOYMENT_{s(t-1)}],$
 $[SWR_{ist}, DTL_{st}],$
 $AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$

BBR_{ist} : $[AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}]$

Policy Variable Related to Food Stamps:

$FOOD_STAMP_{ist}$: $AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}$

Policy Variable Related to Child Support Enforcement Expenditure:

$CHILDSUPPORT_ENFORCE_{st}$: $[AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}]$
 $[NCHILD05_{ist}, NCHILD612_{ist}]$

Policy Variable Related to Medicaid:

$MEDICAID_PCT_{ist}$: $[AGE_{ist}, MARITAL_{ist}, EDU_{ist}, RACE_{ist}]$
 $[NCHILD05_{ist}, NCHILD612_{ist}]$

Table 7: Illustration of Regression Coefficients: Differential Changes of Welfare Participation Rates in Response to Work Requirement/Time Limits for Different Demographics at Different Unemployment Rates.

(Based on Regression Results of Complete Specification for Welfare Participation)

| Demographic Characteristics | | | | Unemployment Rate 4% | | | Unemployment Rate 6% | | | Unemployment Rate 8% | | |
|-----------------------------|-----------|----------------|-----------------------|----------------------|----------------|------------|----------------------|----------------|------------|----------------------|----------------|------------|
| Race | Education | Marital Status | Age of Youngest Child | With No WR or TL | With WR and TL | Difference | With No WR or TL | With WR and TL | Difference | With No WR or TL | With WR and TL | Difference |
| White | HS- | Never Married | 2 | 0.460256 | 0.323463 | 0.136793 | 0.464302 | 0.319703 | 0.144599 | 0.465929 | 0.319524 | 0.146405 |
| Black | HS- | Never Married | 2 | 0.519265 | 0.375885 | 0.14338 | 0.54116 | 0.389974 | 0.151186 | 0.556634 | 0.397643 | 0.158992 |
| White | BA+ | Never Married | 2 | 0.09589 | 0.073589 | 0.022301 | 0.102544 | 0.078998 | 0.023546 | 0.113299 | 0.081987 | 0.031313 |
| Black | BA+ | Never Married | 2 | 0.174298 | 0.14801 | 0.026288 | 0.179362 | 0.149268 | 0.030094 | 0.188005 | 0.150106 | 0.037899 |
| White | HS- | Divorced | 2 | 0.389209 | 0.27216 | 0.11705 | 0.402554 | 0.275699 | 0.126856 | 0.429479 | 0.294818 | 0.134661 |
| Black | HS- | Divorced | 2 | 0.458218 | 0.332582 | 0.125636 | 0.479411 | 0.374575 | 0.104837 | 0.494185 | 0.382937 | 0.111248 |
| White | BA+ | Divorced | 2 | 0.040341 | 0.032629 | 0.007712 | 0.040756 | 0.034993 | 0.005763 | 0.04085 | 0.03508 | 0.005769 |
| Black | BA+ | Divorced | 2 | 0.113252 | 0.108707 | 0.004544 | 0.117614 | 0.105263 | 0.01235 | 0.118555 | 0.1044 | 0.014156 |
| White | HS- | Never Married | 13 | 0.398132 | 0.303873 | 0.094259 | 0.444104 | 0.34204 | 0.102064 | 0.44946 | 0.347338 | 0.102123 |
| Black | HS- | Never Married | 13 | 0.432662 | 0.331816 | 0.100845 | 0.49365 | 0.384999 | 0.108651 | 0.493873 | 0.382016 | 0.111857 |
| White | BA+ | Never Married | 13 | 0.10782 | 0.114654 | -0.006834 | 0.112854 | 0.131882 | -0.019028 | 0.129272 | 0.139049 | -0.009778 |
| Black | BA+ | Never Married | 13 | 0.12235 | 0.142597 | -0.020247 | 0.1624 | 0.174841 | -0.012441 | 0.169498 | 0.174134 | -0.004635 |
| White | HS- | Divorced | 13 | 0.335602 | 0.259087 | 0.076515 | 0.347604 | 0.262743 | 0.084861 | 0.359313 | 0.267186 | 0.092127 |
| Black | HS- | Divorced | 13 | 0.370132 | 0.28703 | 0.083102 | 0.39661 | 0.305702 | 0.090908 | 0.42954 | 0.330826 | 0.098713 |
| White | BA+ | Divorced | 13 | 0.015291 | 0.042868 | -0.027577 | 0.015814 | 0.052585 | -0.036771 | 0.015887 | 0.054304 | -0.038418 |
| Black | BA+ | Divorced | 13 | 0.05982 | 0.09381 | -0.03399 | 0.06536 | 0.095544 | -0.030185 | 0.085566 | 0.107944 | -0.022379 |

Table 8a: Decomposition of Welfare Participation Rate Drop: Overall and by Race.

| Year | Percentage Points Decrease From 1993 (Model) | Contributions From the Following Policy and Economic Variables | | | | | | | | | | | |
|----------------|--|--|--------|-------|--------|-------|--------|-------|--------|-------|--------|----------|--------|
| | | TL | | WR | | EITC | | UNEMP | | CCDF | | MEDICAID | |
| | | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share |
| Overall | | | | | | | | | | | | | |
| 1997 | 11.09 | 1.68 | 15.15% | 4.73 | 42.69% | 4.46 | 40.25% | 2.38 | 21.49% | -0.36 | -3.23% | 0.05 | 0.46% |
| 1998 | 14.43 | 3.06 | 21.19% | 6.74 | 46.68% | 4.67 | 32.33% | 2.69 | 18.60% | -0.63 | -4.35% | 0.25 | 1.76% |
| 1999 | 17.23 | 3.21 | 18.61% | 8.77 | 50.93% | 4.68 | 27.14% | 2.79 | 16.20% | -0.85 | -4.93% | -0.04 | -0.23% |
| 2000 | 19.58 | 3.11 | 15.89% | 11.07 | 56.54% | 4.81 | 24.56% | 2.86 | 14.61% | -0.88 | -4.50% | -0.12 | -0.61% |
| 2001 | 21.44 | 2.33 | 10.85% | 11.86 | 55.29% | 5.38 | 25.07% | 2.23 | 10.39% | -0.43 | -2.02% | -0.13 | -0.59% |
| 2002 | 23.77 | 2.52 | 10.60% | 13.61 | 57.26% | 6.21 | 26.14% | 1.58 | 6.63% | -0.11 | -0.44% | -0.09 | -0.39% |
| White | | | | | | | | | | | | | |
| 1997 | 8.85 | 1.64 | 18.54% | 4.50 | 50.82% | 3.26 | 36.87% | 1.80 | 20.30% | -0.19 | -2.15% | 0.17 | 1.94% |
| 1998 | 12.96 | 3.20 | 24.70% | 6.36 | 49.11% | 3.60 | 27.75% | 2.00 | 15.40% | -0.34 | -2.59% | 0.42 | 3.26% |
| 1999 | 15.11 | 3.16 | 20.92% | 8.35 | 55.21% | 3.64 | 24.07% | 2.01 | 13.32% | -0.44 | -2.88% | 0.09 | 0.59% |
| 2000 | 16.81 | 2.89 | 17.18% | 10.66 | 63.40% | 3.77 | 22.45% | 2.03 | 12.08% | -0.52 | -3.07% | 0.02 | 0.11% |
| 2001 | 18.18 | 1.93 | 10.59% | 11.38 | 62.57% | 4.31 | 23.69% | 1.41 | 7.75% | -0.09 | -0.52% | 0.02 | 0.12% |
| 2002 | 20.20 | 1.88 | 9.30% | 13.02 | 64.44% | 5.31 | 26.28% | 0.99 | 4.88% | 0.07 | 0.36% | 0.05 | 0.26% |
| Black | | | | | | | | | | | | | |
| 1997 | 14.73 | 1.84 | 12.53% | 5.09 | 34.54% | 6.95 | 47.21% | 3.74 | 25.38% | -0.71 | -4.84% | -0.27 | -1.80% |
| 1998 | 16.85 | 3.02 | 17.93% | 7.17 | 42.54% | 6.88 | 40.83% | 4.33 | 25.69% | -1.29 | -7.66% | -0.16 | -0.92% |
| 1999 | 20.97 | 3.80 | 18.12% | 9.16 | 43.66% | 6.95 | 33.15% | 4.71 | 22.45% | -1.75 | -8.37% | -0.38 | -1.82% |
| 2000 | 24.33 | 4.23 | 17.40% | 11.22 | 46.14% | 7.14 | 29.34% | 5.00 | 20.54% | -1.85 | -7.59% | -0.52 | -2.13% |
| 2001 | 27.12 | 4.13 | 15.21% | 11.89 | 43.83% | 7.90 | 29.14% | 4.41 | 16.28% | -1.33 | -4.91% | -0.55 | -2.02% |
| 2002 | 30.09 | 4.88 | 16.20% | 13.56 | 45.05% | 8.38 | 27.85% | 3.18 | 10.58% | -0.62 | -2.07% | -0.55 | -1.81% |

Table 8b: Decomposition of Welfare Participation Rate Drop 1993-2002: By Demographics.

| Demographic Group | Percentage Points Decrease 1993-2002 (Model) | Contributions From the Following Policy and Economic Variables | | | | | | | | | | | |
|-------------------------------|--|--|--------|-------|--------|-------|--------|-------|--------|-------|--------|----------|--------|
| | | TL | | WR | | EITC | | UNEMP | | CCDF | | MEDICAID | |
| | | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share |
| Age of Youngest Child | | | | | | | | | | | | | |
| 0-5 | 32.85 | 4.84 | 14.72% | 19.06 | 58.03% | 7.72 | 23.50% | 0.66 | 2.02% | -0.87 | -2.63% | -0.60 | -1.82% |
| 6-12 | 18.01 | 1.81 | 10.04% | 11.47 | 63.70% | 5.76 | 31.96% | 2.79 | 15.47% | 0.74 | 4.10% | -0.18 | -1.02% |
| Educational Attainment | | | | | | | | | | | | | |
| Less than High School | 36.16 | 7.03 | 19.44% | 19.85 | 54.90% | 9.97 | 27.57% | 2.16 | 5.97% | -0.24 | -0.65% | -0.16 | -0.46% |
| HS and Some College | 20.97 | 1.99 | 9.48% | 13.82 | 65.93% | 6.10 | 29.11% | 1.75 | 8.34% | -0.33 | -1.57% | -0.64 | -3.05% |
| Marital Status | | | | | | | | | | | | | |
| Never Married | 37.37 | 6.42 | 17.17% | 16.73 | 44.75% | 10.25 | 27.42% | 1.86 | 4.97% | -0.93 | -2.49% | -0.60 | -1.61% |
| Separated | 24.99 | 1.95 | 7.79% | 16.66 | 66.67% | 3.71 | 14.86% | 1.34 | 5.37% | -0.18 | -0.70% | -0.04 | -0.15% |
| Divorced | 14.58 | -1.01 | -6.96% | 10.20 | 69.94% | 3.87 | 26.55% | 1.71 | 11.74% | 0.80 | 5.50% | 0.30 | 2.05% |
| Number of Children | | | | | | | | | | | | | |
| One | 19.55 | 0.63 | 3.22% | 12.54 | 64.13% | 5.83 | 29.84% | 1.23 | 6.31% | -0.20 | -1.00% | 0.12 | 0.60% |
| Two + | 28.06 | 4.78 | 17.03% | 14.89 | 53.05% | 6.66 | 23.74% | 1.97 | 7.04% | -0.01 | -0.05% | -0.34 | -1.23% |

Table 9a: Decomposition of Work Participation Rate Increase: Overall and by Race.

| Year | Percentage Points Increase From 1993 (Model) | Contributions From the Following Policy and Economic Variables | | | | | | | | | | | |
|----------------|--|--|--------|-------|--------|-------|--------|-------|--------|-------|--------|----------|-------|
| | | TL | | WR | | EITC | | UNEMP | | CCDF | | MEDICAID | |
| | | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share |
| Overall | | | | | | | | | | | | | |
| 1997 | 7.99 | 0.30 | 3.81% | 1.83 | 22.92% | 0.67 | 8.39% | 4.73 | 59.18% | 0.51 | 6.34% | 0.18 | 2.23% |
| 1998 | 10.96 | 1.25 | 11.43% | 1.82 | 16.60% | 1.05 | 9.55% | 5.21 | 47.51% | 0.81 | 7.38% | 0.30 | 2.77% |
| 1999 | 12.35 | 0.98 | 7.90% | 1.61 | 13.01% | 2.07 | 16.77% | 5.63 | 45.58% | 1.14 | 9.20% | 0.32 | 2.57% |
| 2000 | 13.48 | 0.85 | 6.32% | 1.73 | 12.83% | 2.71 | 20.10% | 5.42 | 40.18% | 1.28 | 9.48% | 0.32 | 2.36% |
| 2001 | 12.26 | 0.91 | 7.46% | 0.79 | 6.46% | 3.33 | 27.14% | 4.06 | 33.14% | 0.75 | 6.08% | 0.32 | 2.58% |
| 2002 | 10.82 | 1.11 | 10.25% | 1.79 | 16.54% | 3.61 | 33.31% | 2.66 | 24.55% | 0.06 | 0.59% | 0.33 | 3.00% |
| White | | | | | | | | | | | | | |
| 1997 | 6.16 | 0.10 | 1.54% | 1.90 | 30.78% | 0.74 | 11.98% | 3.85 | 62.49% | 0.38 | 6.21% | 0.09 | 1.38% |
| 1998 | 9.63 | 0.92 | 9.51% | 2.22 | 23.08% | 1.17 | 12.13% | 4.23 | 43.87% | 0.50 | 5.15% | 0.22 | 2.27% |
| 1999 | 10.56 | 0.58 | 5.48% | 2.19 | 20.69% | 2.14 | 20.28% | 4.34 | 41.06% | 0.71 | 6.69% | 0.21 | 2.01% |
| 2000 | 11.52 | 0.28 | 2.46% | 2.64 | 22.87% | 2.71 | 23.56% | 4.17 | 36.17% | 0.83 | 7.24% | 0.22 | 1.87% |
| 2001 | 10.21 | 0.29 | 2.84% | 2.04 | 20.01% | 3.34 | 32.72% | 2.96 | 28.98% | 0.31 | 3.07% | 0.21 | 2.06% |
| 2002 | 9.58 | 0.24 | 2.46% | 3.45 | 35.95% | 3.70 | 38.64% | 1.86 | 19.44% | -0.17 | -1.78% | 0.22 | 2.29% |
| Black | | | | | | | | | | | | | |
| 1997 | 10.61 | 0.61 | 5.76% | 1.70 | 15.98% | 0.40 | 3.78% | 6.63 | 62.52% | 0.77 | 7.23% | 0.43 | 4.02% |
| 1998 | 12.90 | 1.74 | 13.45% | 1.14 | 8.84% | 0.60 | 4.63% | 7.42 | 57.53% | 1.41 | 10.93% | 0.57 | 4.41% |
| 1999 | 15.45 | 1.51 | 9.79% | 0.70 | 4.55% | 1.64 | 10.60% | 8.61 | 55.70% | 1.97 | 12.77% | 0.63 | 4.05% |
| 2000 | 16.83 | 1.75 | 10.42% | 0.18 | 1.09% | 2.44 | 14.47% | 8.44 | 50.16% | 2.15 | 12.74% | 0.65 | 3.85% |
| 2001 | 15.65 | 1.87 | 11.97% | -1.17 | -7.48% | 3.08 | 19.66% | 6.72 | 42.92% | 1.62 | 10.33% | 0.68 | 4.33% |
| 2002 | 12.93 | 2.49 | 19.23% | -0.55 | -4.27% | 3.06 | 23.64% | 4.40 | 34.06% | 0.49 | 3.80% | 0.69 | 5.33% |

Table 9b: Decomposition of Work Participation Rate Increase 1993-2002: By Demographics.

| Demographic Group | Percentage Points Increase 1993-2002 (Model) | Contributions From the Following Policy and Economic Variables | | | | | | | | | | | |
|-------------------------------|--|--|--------|-------|--------|-------|--------|-------|--------|-------|--------|----------|--------|
| | | TL | | WR | | EITC | | UNEMP | | CCDF | | MEDICAID | |
| | | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share | Level | Share |
| Age of Youngest Child | | | | | | | | | | | | | |
| 0-5 | 16.79 | 2.21 | 13.15% | 3.50 | 20.86% | 3.91 | 23.30% | 3.02 | 17.97% | 0.26 | 1.55% | 0.03 | 0.16% |
| 6-12 | 6.48 | 0.97 | 14.99% | 1.25 | 19.25% | 3.70 | 57.10% | 2.57 | 39.64% | 0.00 | -0.01% | 0.29 | 4.48% |
| Educational Attainment | | | | | | | | | | | | | |
| Less than High School | 17.16 | 2.59 | 15.08% | 7.13 | 41.52% | 2.70 | 15.73% | 3.12 | 18.19% | 0.91 | 5.32% | 0.53 | 3.10% |
| HS and Some College | 7.24 | 1.09 | 15.11% | 0.50 | 6.89% | 4.01 | 55.39% | 2.89 | 39.97% | -0.24 | -3.26% | -0.22 | -3.00% |
| Marital Status | | | | | | | | | | | | | |
| Never Married | 18.15 | 2.51 | 13.80% | 0.86 | 4.75% | 5.13 | 28.26% | 4.06 | 22.34% | 0.39 | 2.16% | -0.07 | -0.37% |
| Separated | 12.84 | 1.93 | 15.02% | 2.86 | 22.30% | 3.16 | 24.59% | 2.25 | 17.55% | 0.00 | -0.02% | 0.20 | 1.53% |
| Number of Children | | | | | | | | | | | | | |
| One | 6.98 | 0.15 | 2.15% | 1.20 | 17.25% | 2.83 | 40.62% | 2.53 | 36.26% | 0.07 | 1.02% | 0.42 | 6.08% |
| Two + | 14.89 | 2.26 | 15.16% | 2.49 | 16.74% | 4.53 | 30.41% | 2.80 | 18.82% | 0.05 | 0.36% | 0.21 | 1.38% |

Figure B1. Possible Multiple Equilibria.

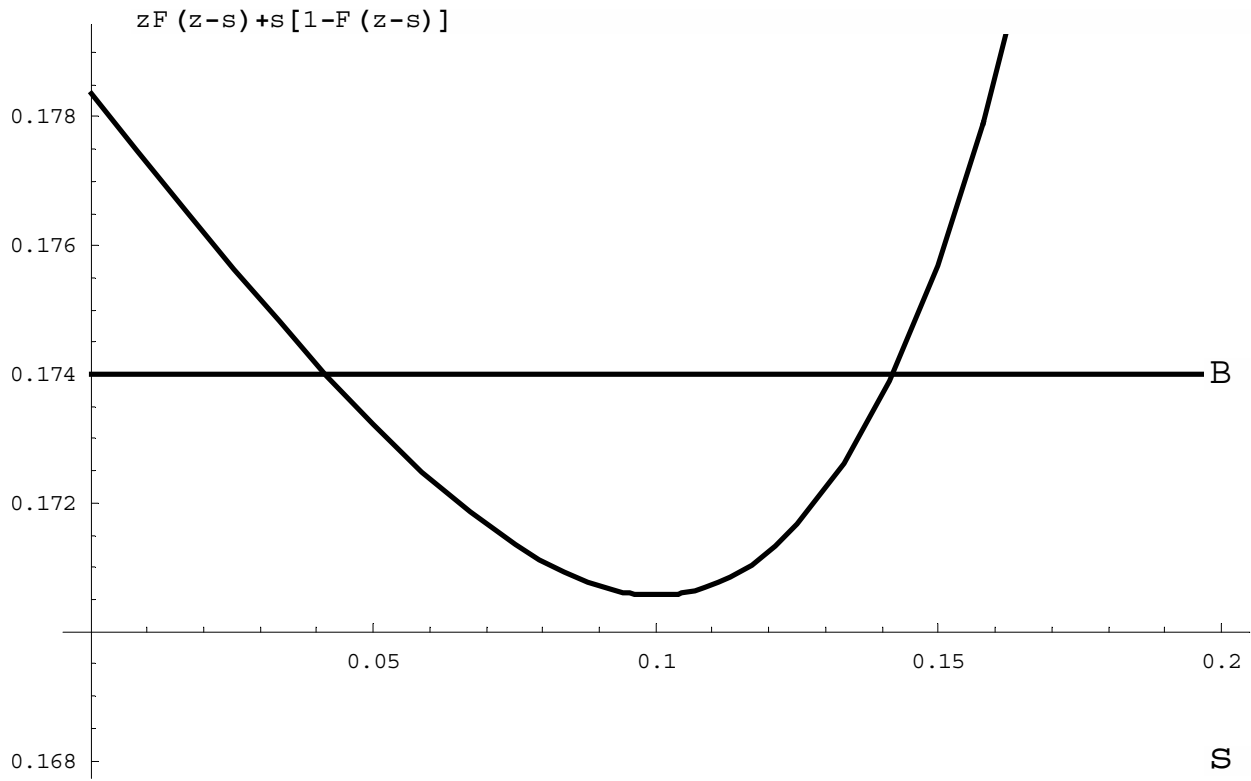


Figure B2. Stable Equilibrium.

