Welfare Reform and Fertility*

Rachel Fung†

27 October, 2022

Abstract

This paper studies the fertility effects of 1990s-era welfare reform in the US, which ended unconditional cash assistance to low-income mothers. I show that individuals more likely to be on welfare pre-reform and thus more likely to be affected experienced larger fertility declines after the reform relative to those less likely. Moreover, this effect is larger in states with more generous pre-reform welfare payments. A back-of-the-envelope calculation suggests that welfare reform in the 1990s may explain over 24% of the decline in overall U.S. fertility between 1992 and 2000. These results have implications for current debates on reinstituting unconditional cash benefits through the Child Tax Credit.

*I am grateful to Leah Boustan and Ilyana Kuziemko for their guidance and support throughout this project. I thank participants of the Princeton Industrial Relations Section Graduate Labor Workshop for helpful comments and suggestions.

†Department of Economics, Princeton University. Email: ylfung@princeton.edu

1 Introduction

The social safety net in the US has changed fundamentally since the 1990s, shifting focus towards work over welfare. The changes were motivated by concerns that entitlement to welfare discourages work and leads recipients to become dependent on welfare. There were also concerns that welfare benefits discouraged marriage and encouraged births out of wedlock (Toner 1992). The end of unconditional cash assistance made it more costly for low-income mothers to have children. Indeed, the high cost of raising children and the lack of financial support by the state have been cited as reasons for the declining birth rates over the past decades (Donegan 2021). This consistent decline in birth rates has raised concerns of demographic stagnation, where an aging population slows down economic growth (Eggertsson, Lancastre, and Summers 2019).

This paper considers 1990s-era welfare reform in the US, where unconditional benefits for low-income women with children were abruptly eliminated. I ask whether the reform affected women's fertility decisions. I use the term "welfare reform" to include the variety of changes to the Aid to Families with Dependent Children (AFDC) program occurring in the early and mid-1990s, which culminated in its replacement with the Temporary Assistance to Needy Families (TANF) program through the passing of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in August 1996.

To estimate the fertility effects of welfare reform, I exploit variation in *(i)* the likelihood that a woman would have received welfare given her personal attributes and *(ii)* the benefit level she would have received in her state before the policy reform. The assumption is that women who were receiving or expected to receive welfare are most directly affected by the reform. Furthermore, women living in states with the most generous benefit levels experience a larger financial shock when they lose access to welfare. I use information on race, age, education and state of residence to predict the likelihood that a woman is receiving

welfare assistance prior to the reform, using pre-reform data from CPS March files. I then construct an annual dataset capturing births of all women aged 15-44 using census and ACS data. Finally, I compare 1982 to 2005 fertility trends of women more versus less likely to receive welfare benefits prior to the reform, and women residing in states with more versus less generous pre-reform welfare benefits.

In this paper, I use an event-study design to estimate the dynamic effects of welfare reform. Due to the business cycle and other concurrent policy changes, it is challenging to identify the causal effect of welfare reform. Using an event-study design as opposed to a difference-in-differences design favored in the earlier literature allows me to estimate dynamic fertility effects, without imposing assumptions on its timing. As a result of pre-PRWORA state policy reforms, by 1993, already one-third of likely welfare recipients lived in states that had already curtailed unconditional cash assistance to mothers. Importantly, I choose 1992 rather than August 1996 as the event year in my analysis to account for the changes in state policies, policy environment, and beliefs about welfare reform from 1992 onwards.

I find that births declined more after this package of reforms for women more likely to be on welfare. Moreover, the effect was larger and more persistent in states with more generous pre-reform welfare payments. In particular, a woman likely to be on welfare who resides in a state with less generous benefits experienced a 7.19% decline in fertility in five years relative to a women less likely to be on welfare from the same states, which stabilized at 5.42% by 2000. For a woman likely to be on welfare residing in a more generous state, fertility relative to a woman not likely to be on welfare residing in a less generous state declined by 9.68% in five years, and continued declining to 10.98% by 2000. A back-of-the-envelope calculation suggests that welfare reform accounts for at least 24% of the overall decline in birth rate between 1992 and 2000.

My paper revisits the literature on fertility effects of welfare in the US, which to date has found little evidence that welfare reform reduced births. Grogger, Karoly, and Klerman

(2002) provides a survey of the literature on the effects of welfare reform on fertility, concluding that reform policies had little effect on births.[1] Many of these studies focus exclusively on early reform policies through AFDC waivers and use only data prior to 1996. They find little evidence of fertility effects, with some even finding positive fertility effects from the reforms. A handful of studies also make use of data after 1996 to investigate the effects of AFDC waivers, again finding little effects on births.[2] Joyce, Kaestner, and Korenman (2003) looks comprehensively at AFDC waivers as well as PRWORA 1996, using vital statistics birth records and a difference-in-differences specification to compare groups more or less likely to use welfare. Consistent with the prior literature, they find little or mixed evidence on fertility effects. In a more recent study, Goodman-Bacon and Cunningham (2019) find that expanded access to welfare through legal services from 1965-1975 increased non-marital birth rates, but the effect was driven by falling marriage rates and birth rates was not affected.

My findings can be reconciled with the null result in the prior welfare reform literature. A difference-in-differences approach compares births before and after the implementation of TANF in 1996. As welfare policies started changing since 1992 and, as I show in Section 2.3, a federal reform was widely anticipated, fertility declined well before 1996. A simple before-and-after comparison that considers the implementation of TANF as the only "event" thus obscures the actual decline. The fall in births occurred primarily between 1993 to 1997, and the slowdown in decline after 1997 would erroneously suggest a null or even positive fertility effect from the reform. I also show that early waivers policies did not drive the results, consistent with the literature finding no effects of AFDC waivers.

1. Moffit (1998) provides a survey of the early literature that investigates the relationship between AFDC benefit *levels* and fertility. These studies do not have consistent findings, with some finding none or mixed results, while some find significant positive effects of benefits on fertility. They use only cross-state variation in benefit levels, and evidence for any fertility effects is weak.

2. Fairlie and London (1997), Dyer and Fairlie (2004), Kearney (2004), Kaushal and Kaestner (2001), and Joyce, Kaestner, Korenman, and Henshaw (2004) focus on family cap policies and find little effects of incremental benefits on births. Family cap policies were first introduced in 9 states prior to 1996, before being implemented nation-wide via TANF. The policy denies further financial assistance to women who give birth to additional children while receiving welfare assistance.

I also complement the literature that investigates the effect of monetary incentives on fertility in providing evidence in the U.S. context. Literature on the effect of pronatal transfers on births in Canada, Israel, and Spain find positive effects with benefit elasticities around 0.1-0.2. The effects appear to be stronger for higher income families (Milligan 2005; Cohen, Dehejia, and Romanov 2013; González and Trommlerová 2021). Fertility is strongly affected by the compatibility of women's career and family goals, which in turn depends on family policies, social norms and labor market conditions (Doepke, Hannusch, Kindermann, and Tertilt 2022). As environments differ across countries, fertility effects of financial incentives may also differ. My preferred specification gives benefit elasticity of 0.108, similar to the range of estimates in other countries.

More than 20 years after the welfare reform, the debate over its effects is still relevant today. As a relief measure to COVID-19, the American Rescue Plan of 2021 expanded the Child Tax Credit (CTC), temporarily re-instituting an unconditional cash assistance to parents. The proposal for a permanent CTC expansion reignited debates about the effects of unconditional benefits, with conservatives likening the CTC to undoing the 1990s-era welfare reform. Many of the arguments echo views supporting welfare reform in the 1980s and 1990s, claiming recipients of unconditional benefits are undeserving and that women might have more children and become dependent on government support (Philbrick 2022). While welfare programs target low-income women and the CTC expansion benefits a broader population, the effects of welfare reform should nonetheless be informative about responses of low-income women to a child allowance.

The remainder of the paper proceeds as follows. The next section presents background information on welfare policies, trends in welfare caseloads and birth rates, and welfare reform. In Section 3 I describe my data sources. Section 4 presents the empirical method, and Section 5 results. Section 6 investigates the role of AFDC waiver policies. Section 7 concludes.

2 Background

2.1 Welfare Policy in the 1990s

The Aid to Families with Dependent Children (AFDC) program was established to encourage the care of low-income children in their own homes, to strengthen family life, and to promote family self-support. The program initially supports children with only one able-bodied parent, although mandatory coverage was extended to cover the spouse of incapacitated or unemployed parents, and later families with unemployed parents. States were entitled to unlimited federal funds at specified matching rates. AFDC is a federal program, but states were allowed discretion in certain aspects. For instance, states were allowed to use AFDC funds to cover optional categories of needy persons and to determine their own benefit levels.

AFDC came under increasing criticism in the 1980s, with conservatives arguing that welfare is harmful for recipients who are trapped in a cycle of poverty. Beginning in 1981, President Reagan cut AFDC spending and allowed states to require welfare recipients to participate in workfare programs. The Family Support Act of 1988 established the Job Opportunities and Basic Skills training program (JOBS), enlarging funding to promote welfare-to-work efforts. Significant changes in the welfare program began in the 1990s. Welfare reform became a central issue in President Clinton's 1992 presidential campaign, which promised to "end welfare as we know it". Even though the "welfare reform bill" was not passed until 1996, welfare reform had already started through the implementation of AFDC waivers.

Since 1962, states were allowed "waivers" of specified parts of the AFDC program, to carry out experiments that promote the objectives of AFDC. Waivers range from modest demonstration projects limited to few counties to state-wide changes in the AFDC program. The 1998 Green Book (Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means) states that the use of waivers was promoted by

Presidents Reagan, Bush and Clinton, with the Clinton administration approving more than 70 waivers for more than 40 States. According to a 1997 report by the U.S. Department of Health and Human Services, *Setting the Baseline: A Report on State Welfare Waivers*, major waiver programs were approved in 37 states during the period 1992-1996. These major waiver policies include: *(i)* termination/reduction time limit, *(ii)* work requirement time limit, *(iii)* changes in JOBS work exemptions, *(iv)* JOBS sanctions, *(v)* family cap, and *(vi)* increased earnings disregard. These policies were later incorporated into TANF and implemented across the nation, thus waivers can be considered the first phase of the welfare reform.

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) was enacted on August 22, 1996, replacing the AFDC program with Temporary Assistance for Needy Families (TANF). TANF increased state discretion in program operation, with some federal conditions for receiving the block grant. To receive full grants, states must achieve minimum work participation rates and spend a certain sum of their own funds on behalf of eligible families. States must also impose a general five-year time limit on TANF-funded benefits and cannot use TANF funds to assist unwed mothers under 18 unless they live in an adult-supervised setting. States were required to implement TANF by July 1, 1997 but could choose to do so earlier, and most states did so as the TANF block grant offered more funds for earlier implementation.

2.2 Trends in Welfare Caseload and Birth Rates

Welfare use was stable before the 1990s, and fell rapidly beginning in the early 1990s as the economy came out of a small recession, as shown in Figure 1a. The timing also corresponds to the first welfare reform policies coming into effect through AFDC waivers. A higher proportion of Black women were on benefits compared to non-Hispanic whites. As a result, they also experienced larger declines in welfare use.

Birth rates declined rapidly beginning in the early 1990s. In particular, Figure 1b shows that birthrates for Black women fell drastically, essentially closing the racial gap within the decade.

There are many confounding factors affecting fertility in the 1990s. Thus a key challenge for this study is to separate out secular trends and identify the effects of welfare reform. The declines in birthrates began years before the welfare reform bill was signed into law in 1996, and before the declines in welfare caseloads. While the raw trends in birth rates do not suggest an obvious role of welfare reform, this paper investigates the relationship in more detail.

2.3 Welfare Reform Prior to PRWORA 1996

Existing research makes use of variations in timing of policy changes, and assume that fertility effects are contemporaneous. However, this may not be a reasonable assumption. State AFDC waivers meant reform policies were implemented in some states as early as 1992. Welfare reform was also hotly debated well before PRWORA was passed in 1996, and was a major issue in President Clinton's 1992 presidential campaign. It is plausible that in this political environment, even women in states without waiver policies took into account possible reforms and responded by reducing births.

I look for evidence that women anticipated the federal welfare reform from Gallup polls. As shown in Figure 2a, respondents were asked in January 1994 whether they anticipated significant changes to the welfare system by the end of the year. Almost half of all female respondents believed that there *would* be significant changes. In particular, those women more likely to be on welfare were more likely to respond in the affirmative, with 61.82% African American women and 54.86% white women with no college education believing significant reforms would happen within the year. In August 1995, respondents were again asked whether they anticipated significant changes to the welfare system that fall. Half

of all female respondents replied in the affirmative at this point. Figure 2b shows that 74% of African American women and 51.59% of white women with no college education believed that welfare reform is imminent. This is especially striking given that the Clinton administration had not presented any specific plans for welfare reform until June 1994, and the Republican-controlled congress did not pass the first vetoed welfare reform bill until late 1995.

The Gallup polls did not include similar questions in earlier years, so I turn to network news data to assess the salience of welfare reform in the media. Figure 3 plots the percent of total news minutes in the three network nightly news programs that cover stories with the words "welfare" and "reform". Mentions of welfare reform clearly increased in 1992, corresponding to President Clinton's 1992 presidential campaign. Coverage of welfare reform remained high until 1996, when the welfare reform bill was signed into law.

With evidence that women had anticipated major reforms to the welfare system as early as 1994, increased media and public attention beginning in 1992, as well as many state waiver policies between 1992 and 1995, we may well expect fertility responses *before* the implementation of federal welfare reform policies. Hence in my analysis below, I use an event-study framework with 1992 as the event year to flexibly account for such anticipation.

3 Data

I use the 1990 and 2000 5% Census data together with ACS data from 2001 to 2010 to create a large representative sample of women.[3] I take each survey round and identify all children aged 1 to 10 years old, matching them back to their mothers. Then, using the birth year of each child, I am able to identify births by all women in the 1 to 10 years prior to the survey year. With this information, I create a 10-year panel for the 10 preceding years

3. ACS data is used for the years 2001-2010 as the IPUMS 2010 Census data does not report data for mother-children linkages or information on education.

of each survey round, containing information on each women and whether or not she gave birth in that year. Finally, I restrict the sample to women between ages 15 and 44 in each year. This results in a representative sample of women of reproductive ages for the years 1980-2009, with demographic variables as well as data on whether they gave birth in each year.

One worry may be that as children grow up, they may leave the mother's household and would not be identified. Older children will be undersampled in this case, which would be problematic particularly for identifying births in 1980 and 1990, identified only off children aged 10 in the 1990 and 2000 Censuses respectively. Children aged 1 to 10 are not very likely to leave their mother's household, hence this should not be of serious concern. I confirm this with the final dataset. If I undersample older children, births in 1989 should be captured well (identified off 1 year olds in the 1990 Census) while births in 1990 would be undersampled (identified off 10 year olds in the 2000 Census), resulting in a discontinuity in births at 1990. The imputed birth rates are reported in Figure A.1. There does not seem to be a discontinuity in imputed birth rates at 1990 in the sample. Furthermore, while birth rates are undercounted, they track the trends in population birth rates.[4] Overall, my dataset captures fertility well across the sample period.

4 Empirical Method

If cash assistance increases fertility, then we should observe fertility falling after welfare reform. In particular, the effect of welfare reform should increase with the likelihood of receiving benefits and the generosity of benefits. The likelihood of being on welfare measures how likely a woman is treated by the reform, while benefit amount measures the intensity of treatment. This argument leads to two testable hypotheses: *(i)* individuals more likely

4. Young children ages 0 to 4 have historically been undercounted in decennial censuses and Census Bureau surveys.

to use welfare should experience larger declines in fertility; and *(ii)* the decline should be more pronounced in states with higher pre-reform welfare benefits. These two predictions are discussed in subsections 1 and 2 below.

4.1 Likelihood of Welfare Use

Women were affected by welfare reform if they were on welfare or if they considered welfare as an option for the future. Those more prone to using welfare should then be more affected by the policy, and fertility should decline more for them after the reform. Given the secular decline in fertility beginning in the 1990s, it is particularly important to consider the group of women unlikely to use welfare as a control group. These women were likely not affected by welfare reform, hence changes in their fertility can be attributed to factors unrelated to the reform, and considered the counterfactual trend in fertility for women likely to be on welfare in the absence of reform.

I predict likelihood of welfare use by estimating the following logit model with pre-reform data from 1986 to 1991:

$$AFDC_i = \alpha_r + \beta_a + \gamma_e + \delta_{ra} + \zeta_{re} + \eta_s + \epsilon_i, \tag{1}$$

where $AFDC_i$ is a dummy for individual i being on AFDC, and model includes fixed effects for race r, age group a, education group e, race-age and race-education interactions, and state s. The regression is run on data from CPS March files for the years 1986 to 1991 for women aged 15 to 44.

Predicted probabilities range from 0.0147% to 56.79% and is heavily skewed towards zero, with mean probability 4.501% and median 1.920%. The distribution of predicted probabilities is shown in Figure A.2. This measure of likelihood is predicted, hence it is difficult to directly interpret the magnitudes. Therefore, I split the sample at the mean to

obtain two subsamples of women more or less likely to be on AFDC, and hence more or less treated by the welfare reform. The subsample of women more likely to use AFDC consists of 28.94% of the sample, which is consistent with the fraction of women reporting ever using welfare in survey data.[5]

The comparison between women with high vs low predicted probability of welfare use motivates the following regression specification:

$$Birth_{ist} = \sum_{k \neq 1992} \beta_k \mathbb{1}\{t = k\} \times HighLikelihood_i + \beta_0 HighLikelihood_i + \delta_t + \delta_s + \eta X_{ist} + \epsilon_{ist}. \tag{2}$$

where $Birth_{ist}$ takes value 100 if individual i in state s gave birth in year t and 0 if not; $HighLikelihood_i$ is a dummy variable for individual i's predicted welfare use being above the mean; δ_t, δ_s are year and state fixed effects; and X_{ist} are control variables including region-year fixed effects, education, race and age controls, state-level unemployment, and state EITC maximum credit for a filer with 2 dependents.

The parameters of interest are β_k, which measure the difference in probability of giving birth for an individual who is at high likelihood of using welfare, compared to an individual at low likelihood. As the dependent variable takes value 0 or 100, the coefficients are interpreted as the percentage point change in the likelihood of giving birth.

Due to differences in data coding, predictions are not directly comparable across census years.[6] In Appendix B, I show that the main results are robust to using only data from the 2000 Census, which allows for a consistent measure of predicted welfare use across years.

5. The Kaiser Family Foundation/Harvard School of Public Health Poll asked in December 1994 and November 1996 whether the respondent or their family had ever received welfare benefits. 27.16% of females in 1994 and 23% in 1996 reported having received welfare. Data accessed through the Roper Center.

6. The 1990 census as well as the CPS data used to train the prediction do not classify people into two or more racial groups, which later censuses and ACS do. While mixed race women are of neither race in later censuses and ACS, it is unclear how they are classified in the 1990 census and CPS. This results in a discontinuity in the fraction of women reported in each race, and a corresponding discontinuity in predicted welfare use across census years. Education categories also show inconsistencies across census years. For women born in the same year, data from difference census years show a different fraction to have received a college degree.

A further robustness check uses an alternative choice of high vs low likelihood of welfare use. The main specification splits the sample at mean predicted welfare use, which compares very similar women at the margin. In Appendix B, I replicate the main results by comparing women with predicted welfare use above the mean to the same population of women with the lowest predicted welfare use. Figure A.2 illustrates the different choices for the low-likelihood group.

4.2 Combining Variation in Generosity of Welfare Payments

States have discretion in determining benefit levels under AFDC, which results in wide variations across states. These benefit levels are generally stable across time, and the variations can be traced historically to the initiation of the program. AFDC was originally created under the name Aid to Dependent Children (ADC) by the Social Security Act of 1935, which granted states the authority to set their own benefit levels. (Wexler and Engel 1999)

The maximum benefit levels for a one-parent family of three persons in January 1990 ranges from $118 in Alabama to $846 in Alaska. Figure A.3a shows the geographic variation in benefit levels. States in the northeast, midwest, and the west coast have more generous AFDC benefits. When I split states into those with high and low average benefits as shown in Figure A.3b, states with high benefit levels are geographically concentrated. A histogram of maximum benefit levels is shown in Figure A.4.

In states with more generous pre-reform welfare payments, losing access to welfare corresponds to a larger decrease in income. If losing welfare benefits reduces fertility, births should decline more in states with larger benefit payments compared to states with smaller benefits.

I thus consider the following regression:

$$Birth_{ist} = \sum_{k \neq 1992} \beta_k \mathbb{1}\{t = k\} \times Benefit_s + \beta_0 Benefit_s + \delta_t + \eta X_{ist} + \epsilon_{ist}, \tag{3}$$

where $Benefit_s$ is the AFDC maximum benefits for a three-person family in January 1990 in state s divided by 100.

The coefficients of interest β_k are interpreted as the percentage point change in probability of birth from 1992 to year k for a \$100 increase in benefit level.

As only around 5% of women were on AFDC prior to the welfare reform, only this small subset of women are affected by the reform. It is unlikely that there would be large effects on state-wide birth rates. To account for this, I estimate a more flexible model that allows for the two sources of variation to interact. With two sources of variation, this essentially means the data is split into four groups *(i)* women with low likelihood of welfare use who live in states with low benefit levels; *(ii)* women with low likelihood of welfare use who live in states with generous benefit levels; *(iii)* women with high likelihood of welfare use who live in states with low benefit levels; and finally *(iv)* women with high likelihood of welfare use who live in states with generous benefit levels.

I consider the following expanded regression:

$$\begin{aligned} Birth_{ist} = & \sum_{k \neq 1992} \beta_{1,k} \mathbb{1}\{t = k\} \times (1 - HighUse_i) \times HighBen_s \\ & + \sum_{k \neq 1992} \beta_{2,k} \mathbb{1}\{t = k\} \times HighUse_i \times (1 - HighBen_s) \\ & + \sum_{k \neq 1992} \beta_{3,k} \mathbb{1}\{t = k\} \times HighUse_i \times HighBen_s \\ & + \gamma_1 HighUse_i + \gamma_2 HighUse_i \times HighBen_s + \delta_t + \delta_s + \eta X_{ist} + \epsilon_{ist}, \end{aligned} \tag{4}$$

where $HighBen_s$ is a dummy variable for state s being one of the 25 states (and the District

of Columbia) with the highest AFDC maximum benefit in January 1990.

The coefficients of interest are $\beta_{1,k}$, $\beta_{2,k}$, and $\beta_{3,k}$. $\beta_{1,k}$ measure the difference in probability of births for women with low predicted welfare use in high benefit states, compared to the control group women with low predicted welfare use in low benefit states; $\beta_{2,k}$ captures the difference in probability of births for women with high predicted welfare use in low benefit states, compared to the control group; and $\beta_{3,k}$ the difference for women with high predicted welfare use in high benefit states compared to the control.

5 Results

5.1 Likelihood of Welfare Use

Figure 4 plots the results from Equation 2, comparing the probability of birth for women at high versus low likelihood of welfare use. The first series plots the estimates from a regression with no additional controls beyond state and year fixed effects. The results show that births for women at high and low likelihood of welfare use evolved in parallel prior to the 1990s. As the welfare reform came into effect, births fell relatively for women more likely to be on welfare and thus affected by the policy change. The coefficient is -0.22111 in 1993, increasing to -0.78533 by 2000. This indicates a 0.22111pp fall in probability of birth by 1993, and a 0.78533pp fall by 2000. The baseline probability of birth in the data is 6.27% in 1992, 8.98% for the high likelihood group and 5.10% for the low-likelihood group. The coefficients then suggest that for women more likely to use welfare, probability of birth fell by 2.46% in one year, with the effect increasing to 8.75% by 2000.

Regions with higher proportions of women on welfare may have experienced social and political changes that affected fertility outside of the welfare reform. I add region-year fixed effects in the second series to capture these social and political differences across regions, and any other unobserved changes within regions across time. The results are robust to

region-year fixed effects.

The economy was recovering from a recession in the early 1990s, which could have impacted fertility. In the third series I additionally includ state-year unemployment controls, as well as demographic controls to account for different birth rates by race, age and education groups. Again, the results are robust to the additional controls.

The policy environment was complex in the 1990s, with state-level EITC expansions as well as various state welfare reform policies. I add controls for state-year EITC benefit amount (for a filer with two dependants) to the fourth series to capture effects from EITC policies. I take this as my preferred specification. Results remain robust to alternative specifications, and the preferred specification gives a coefficient of -0.67211 in 2000, suggesting that births fell by 7.48% in eight years for women more likely to be on welfare.

5.2 Combining Variation in Generosity of Welfare Payments

Figure 5 presents results from Equation 3, estimating the effect of benefit generosity on probability of birth. Again, I add region-year fixed effects in the second series to account for the geographic correlation in benefit amount, the third series includes state unemployment and demographic controls, and the last series includes state EITC controls. The patterns in the estimates are robust to alternative specifications.

There is a pre-trend prior to 1992, with birth rates increasing in states with high welfare benefits relative to less generous states. There is a clear trend break around the event time of 1992, when birth rates evolved roughly parallel for more and less generous states for several years. In 1996, the trend abruptly changes again, and birth rates started *declining* in states with generous welfare benefits compared to less generous states. The timing of the reversal of trends around the welfare reform gives credibility to the changes being driven by the reform.

The observed pre-trends imply that I likely underestimate the effects of the welfare reform here. The preferred specification gives coefficients -0.0309 in 1993 and -0.0951 in 2000,

indicating a 0.0309pp fall in probability of birth for a $100 loss in benefits by 1993, and a 0.0951pp fall by 2000. With mean benefits (in 1990) of $411.85, this translates to a decline of 0.1236pp (or 1.38%) in one year and 0.3913pp (4.36%) in eight years.

Figure 6 shows results from Equation 4 considering both sources of variation, using the preferred specification that controls for region-year fixed effects, state unemployment, race, age, education, as well as state-year EITC policy. Here, women not likely to be on welfare who reside in states with less generous welfare benefits serve as the control group, as they should not be affected by the reform. As expected, welfare reform did not affect women at low likelihood of welfare use even if they reside in states with generous welfare benefits. For women at high likelihood of welfare use, probability of birth declined sharply around 1992. This decline is similar for women residing in low and high generosity states in the short run, with a decline of 1.76% and 2.88% in one year, and 7.19% and 9.68% in five years respectively.

Around the time when PRWORA was passed and welfare (AFDC and TANF) caseloads began falling, birth rates for those in less generous states stabilized, while birth rates for those in more generous states declined further. By 2000, birth rates had declined by 5.42% in less generous states and 10.98% in more generous states. This is consistent with an early effect around 1992 causing declines in fertility for all women at high likelihood of welfare use, with an additional effect of losing access to welfare that is increasing in benefit amount.

My results here show that births began falling in around 1992, when AFDC waivers were in effect but before TANF replaced AFDC nationally. This is consistent with the literature finding no fertility effects of TANF using a difference-in-differences approach. As fertility effects stabilize over time, a difference-in-differences estimator comparing fertility before and after 1996 would find null or even a positive effect.

A back of the envelope calculation suggests that welfare reform can explain at least 24% of the overall decline in births between 1992 and 2000. The sample probability of birth (birth

rate divided by 1000) is 6.27% in 1992 and 5.89% in 2000.[7] I assume only women with high likelihood of welfare use residing in states with high benefits are treated to estimate a lower bound. This conservative estimation ensures that any demographic changes that resulted in a fall in births for the high likelihood group compared to the low likelihood group are not attributed to welfare reform. From the estimation of Equation 4, the coefficients by 2000 for the high likelihood low benefit group and the high likelihood high benefit group are -0.48649 and -0.98577 respectively. Hence welfare reform reduced the probability of birth for the high likelihood high benefit group by 0.50pp. Women with high likelihood of welfare use residing in states with generous benefits account for 18.66% of the sample, which implies that welfare reform explains at least

$$\frac{0.50 \times 0.1866}{6.27 - 5.89} \approx 24\%$$

of the overall decline in birth rate between 1992 and 2000.

6 Role of Waiver Policies

Previous literature investigating the effect of AFDC waiver policies finds little evidence of fertility effects. In this section, I turn to the role of AFDC waiver policies and investigate whether they played a role in the decline in fertility from 1992.

Using data from *Setting the Baseline: A Report on State Welfare Waivers*, I consider major waiver programs approved between 1992-1996 and implemented before TANF came into effect. In the six types of major waiver policies included: *(i)* termination/reduction time limit, *(ii)* work requirement time limit, *(iii)* changes in JOBS work exemptions, *(iv)* JOBS sanctions, *(v)* family cap, and *(vi)* increased earnings disregard, the first five should give women incentives to reduce births as welfare benefits are reduced. Increased earnings disregard, however, means recipients get to keep *more* of their income from work. These

7. Sample birth rates and weight for each group are reported in Table 2.

policies were motivated by concerns that termination of the earned income disregard after a short period removes the economic incentive for recipients to work. Although increased earnings disregard encourages transition to work, it increases benefits in the short run and its fertility effects are ambiguous. Therefore, I do not consider these types of waivers in my following analysis. I also consider only waiver policies that apply to the entire state, and split states by the year their first waiver policy was implemented. Table 1 provides summary statistics for these groups of states.

As seen in Figure 7a, several populous states implemented AFDC waivers very early on. Figure 7b shows that by the end of 1993, over a quarter of the population of women aged 15 to 44 were affected by at least one AFDC waiver policy. The proportion is even larger if we weigh states by welfare use, as states that implemented waiver policies early are also those with the highest proportion of women on welfare. These states with early waivers also have the most generous benefits, hence we may expect the magnitude of fertility effects to be larger in these states, in addition to an earlier decline in fertility as women were subjected to welfare reform policies earlier.

There are many types of waiver policies implemented across the states within a short timeframe, and forward-looking women may respond prior to the *implementation* of policies. Therefore, I do not consider all variations in waiver types and timings. Instead, I compare states that implemented waivers early in 1992-1993, to states that did not have waivers until 1996 or at all. I run the regression in Equation (2) for these 2 groups of states separately. If the implementation of AFDC waivers did reduce fertility, births should decline earlier for states with waivers in 1992 to 1993 compared to states that did not have waiver policies until 1996.

Figure 8 shows the differences in probability of birth for women at high vs. low likelihood of welfare use, for states with waivers in 1992-1993 and states that did not have waivers before 1996 respectively. The results are similar to that using the full sample, and do not

suggest that the timing of fertility declines is correlated with the timing of waiver policies. In particular, even in states where no welfare reform policies were implemented before 1996, the decline in births occurred almost entirely before the implementation of TANF in 1996-1997. The fertility declines before PRWORA do not appear to be driven by waiver policies, but due to women across the US anticipating imminent changes in the welfare system. The results here are consistent with previous literature finding little evidence of fertility effects of AFDC waivers.

7 Conclusion

In this paper I analyze fertility effects of the 1990s-era welfare reform using an event-study framework. The results are consistent with welfare reform reducing fertility. Compared to women less likely to use welfare, probability of birth declined by 7.48% between 1992 and 2000 for women more likely to use welfare. Losing more generous benefits is associated with larger fertility declines, probability of birth for women likely to be on welfare declined by 5.42% in states with less generous benefits and 10.98% in more generous states. AFDC waivers were not important, but women seem to have reduced births as they anticipated major reforms to the welfare system. A back-of-the-envelope calculation suggests that welfare reform can explain at least 24% of the overall decline in fertility during the period 1992 to 2000.

The debate over the effects of welfare reform is still relevant today. As a response to COVID-19, the American Rescue Plan Act 2021 expanded the Child Tax Credit (CTC), increasing the credit for low- and moderate-income taxpayers. The credit was also made fully refundable, removing any work requirements for receiving it. President Biden's American Families Plan proposed extending this expanded tax credit through 2025, but response was lukewarm and the extension stalled.

This expansion of the CTC works very much like welfare for poor families, and have been

likened to an overturning of the welfare reform. Americans' opposition to unconditional cash benefits seem deep-rooted, and arguments opposing the expanded child tax credit echo views supporting welfare reform in the 1990s. Those who oppose the expansion believe that assistance should not be unconditional, but should only be given to those who are deserving. They believe that people may spend the money on non-child related items, or they may have more children to maximize the value of benefits. As the welfare reform is akin to a reverse experiment of the CTC expansion for poor families, the impacts of the welfare reform should be informative about potential effects of a permanent CTC expansion.

While fertility responds to financial incentives, women are forward-looking in making fertility decisions. An unconditional benefit such as the Child Tax Credit expansion can be expected to increase fertility among recipients, but the increase may be dampened if women perceive the extension to be temporary. With strong opposition to unconditional benefits, it seems unlikely that such policies can be permanently reinstituted and "undo" the fertility effects of the welfare reform.

References

Cable News Network (CNN)/USA Today. 1994. *Gallup/CNN/USA Today Poll: January, 1994, Wave 2, 1994 [Dataset].* Roper #31088238, Version 0. Gallup Organization [producer]. Cornell University, Ithaca, NY: Roper Center for Public Opinion Research [distributor]. Access Date: Jul-06-2022.

———. 1995. *Gallup/CNN/USA Today Poll: Clinton vs. Congress, 1995 [Dataset].* Roper #31088272, Version 0. Gallup Organization [producer]. Cornell University, Ithaca, NY: Roper Center for Public Opinion Research [distributor]. Access Date: Jul-06-2022.

Cohen, Alma, Rajeev Dehejia, and Dmitri Romanov. 2013. "Financial Incentives and Fertility." *The Review of Economics and Statistics* 95 (1): 1–20.

Doepke, Matthias, Anne Hannusch, Fabian Kindermann, and Michèle Tertilt. 2022. *The Economics of Fertility: A New Era.* Working Paper, Working Paper Series 29948. National Bureau of Economic Research, April.

Donegan, Moira. 2021. "The decline in the US birth rate is not about moral failure, it's about economics." *The Guardian.*

Dyer, Wendy Tanisha, and Robert W. Fairlie. 2004. "Do family caps reduce out-of-wedlock births? Evidence from Arkansas, Georgia, Indiana, New Jersey and Virginia." *Population Research and Policy Review* 23:441–473.

Eggertsson, Gauti B., Manuel Lancastre, and Lawrence H. Summers. 2019. "Aging, Output Per Capita, and Secular Stagnation." *American Economic Review: Insights* 1 (3): 325–42.

Fairlie, Robert W., and Rebecca A. London. 1997. "The Effect of Incremental Benefit Levels on Births to AFDC Recipients." *Journal of Policy Analysis and Management* 16 (4): 575–597.

Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. 2021. *Integrated Public Use Microdata Series, Current Population Survey: Version 9.0.* [dataset]. IPUMS, Minneapolis, MN.

González, Libertad, and Sofia Karina Trommlerová. 2021. "Cash Transfers and Fertility: How the Introduction and Cancellation of a Child Benefit Affected Births and Abortions." *The Journal of Human Resources:* 0220–10725R2.

Goodman-Bacon, Andrew, and Jamein P Cunningham. 2019. *Changes in Family Structure and Welfare Participation Since the 1960s: The Role of Legal Services.* Working Paper, Working Paper Series 26238. National Bureau of Economic Research, September.

Grogger, Jeffrey, Lynn A. Karoly, and Jacob Alex Klerman. 2002. *Consequences of Welfare Reform: A Research Synthesis.* Technical report DRU-2676-DHHS. RAND.

House of Representatives, Congress. 1998. *Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means (Green Book).* U.S. Government Printing Office.

Joyce, Ted, Robert Kaestner, and Sanders Korenman. 2003. "Welfare Reform and Non-Marital Fertility in the 1990s, Evidence from Birth Records." *Advances in Economic Analysis & Policy* 3 (1): 1–34.

Joyce, Ted, Robert Kaestner, Sanders Korenman, and Stanley Henshaw. 2004. "Family cap provisions and changes in births and abortions." *Population Research and Policy Review* 23:475–511.

Kaushal, Neeraj, and Robert Kaestner. 2001. "From Welfare to Work: Has Welfare Reform Worked?" *Journal of Policy Analysis and Management* 20 (4): 699–719.

Kearney, Melissa Schettini. 2004. "Is There an Effect of Incremental Welfare Benefits on Fertility Behavior? A Look at the Family Cap." *The Journal of Human Resources* 39:295–325.

Milligan, Kevin. 2005. "Subsidizing the Stork: New Evidence on Tax Incentives and Fertility." *The Review of Economics and Statistics* 87 (3): 539–555.

Moffit, Robert A. 1998. "The Effect of Welfare on Marriage and Fertility." In *Welfare, the Family, and Reproductive Behavior,* 50–97. National Academies Press.

Philbrick, Ian Prasad. 2022. "Why Isn't Biden's Expanded Child Tax Credit More Popular?" *The New York Times.*

Public Health, Henry J. Kaiser Family Foundation/Harvard School of. 1994. *Kaiser Family Foundation/Harvard School of Public Health Poll: Welfare Survey, 1994 [Dataset].* Roper #31094133, Version 2. KRC Communications Research [producer]. Cornell University, Ithaca, NY: Roper Center for Public Opinion Research [distributor]. Access Date: Aug-15-2022.

———. 1996. *Kaiser Family Foundation/Harvard School of Public Health Poll: Health Care in the 1996 Elections, 1996 [Dataset].* Roper #31096563, Version 2. Princeton Survey Research Associates [producer]. Cornell University, Ithaca, NY: Roper Center for Public Opinion Research [distributor]. Access Date: Aug-15-2022.

Rosewater, Ann. 1997. *Setting the Basline: A Report on State Welfare Waivers.* Office of the Assistant Secretary for Planning, Evaluations, U.S. Department of Health, and Human Services.

Ruggles, Steven, Sarah Flood, Sophia Foster, Ronald Goeken, Jose Pacas, Megan Schouweiler, and Matthew Sobek. 2021. *IPUMS USA: Version 11.0.* [dataset]. IPUMS, Minneapolis, MN.

Toner, Robin. 1992. "New Politics of Welfare Focuses on Its Flaws." *The New York Times.*

Wexler, Sandra, and Rafael J. Engel. 1999. "Historical Trends in State-Level ADC/AFDC Benefifits: Living on Less and Less." *The Journal of Sociology & Social Welfare* 26 (2).

Table 1: Summaries of States by Timing of AFDC Waivers

Year	States	Population	Cumulative Population	Max AFDC Benefit	% on Welfare
1992	CA MI NJ	11.2M	15.6M	551	6.27%
1993	IA IL OR UT	4.4M			
1994	AR GA SD VT	2.4M			
1995	AZ DE IN MA MO MS VA	7.1M	9.5M	326	4.93%
1996	CT MD NC NE OH TN TX WA WI WV	14.4M			
1997	HI	0.3M			
No waivers	AK AL CO DC FL ID KS KY LA ME MN MT ND NH NM NV NY OK PA RI SC WY	19.0M	33.6M	370	4.95%

Note: Year denotes the year each state implemented their first major waiver. Population is 1990 count of women aged 15-44 from the National Cancer Institute Survey of Epidemiology and End Results (SEER) population Data. Benefit is the 1990-population-weighted average of the maximum benefit for a 1 parent household of three people in January 1990. Use is the population-weighted average of the % of women aged 15-44 reported to be on AFDC in CPS March files 1986-1993.

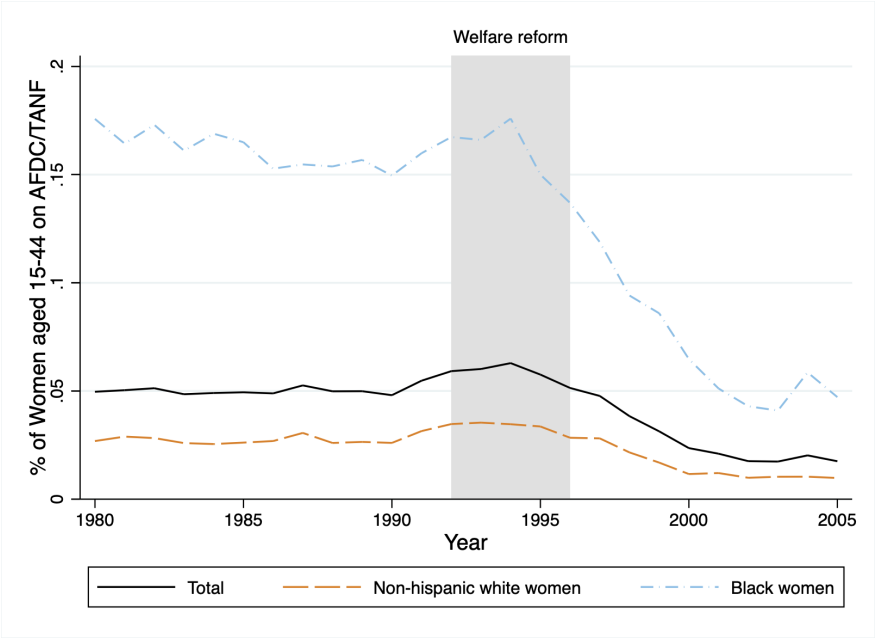
Table 2: Summary Statistics for Back-of-the-Envelope Calculation

	Probability of birth	Population weight
Low likelihood of welfare use, low benefit state	.0523383	.3546468
Low likelihood of welfare use, high benefit state	.0496149	.3428414
High likelihood of welfare use, low benefit state	.0906725	.1158938
High likelihood of welfare use, high benefit state	.0892769	.1866179

Note: Table reports sample probability of birth and population weight in 1992 for the four groups of women with low vs high likelihood of welfare use residing in low vs high benefit states as described in Section 5.1.

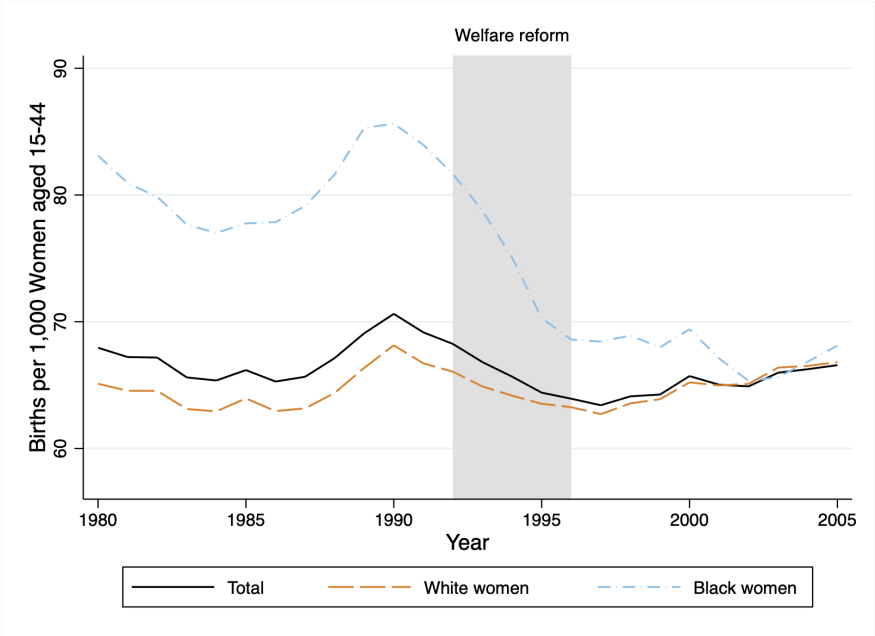
Figure 1: Trends in Welfare Use and Birth Rate in the US

(a) Welfare Use



Note: Calculations from CPS March files.

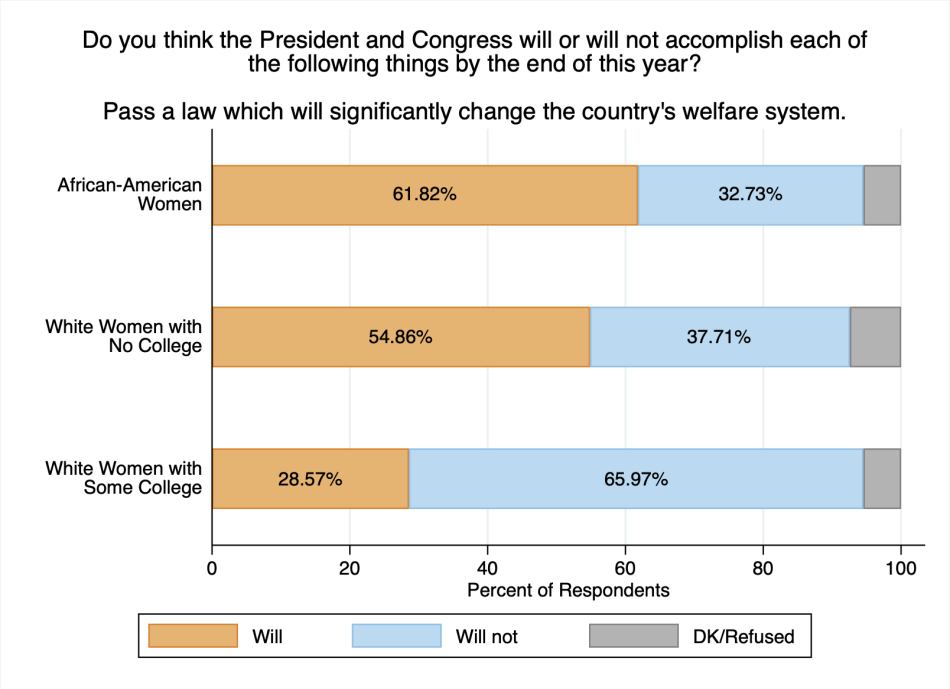
(b) Birthrate



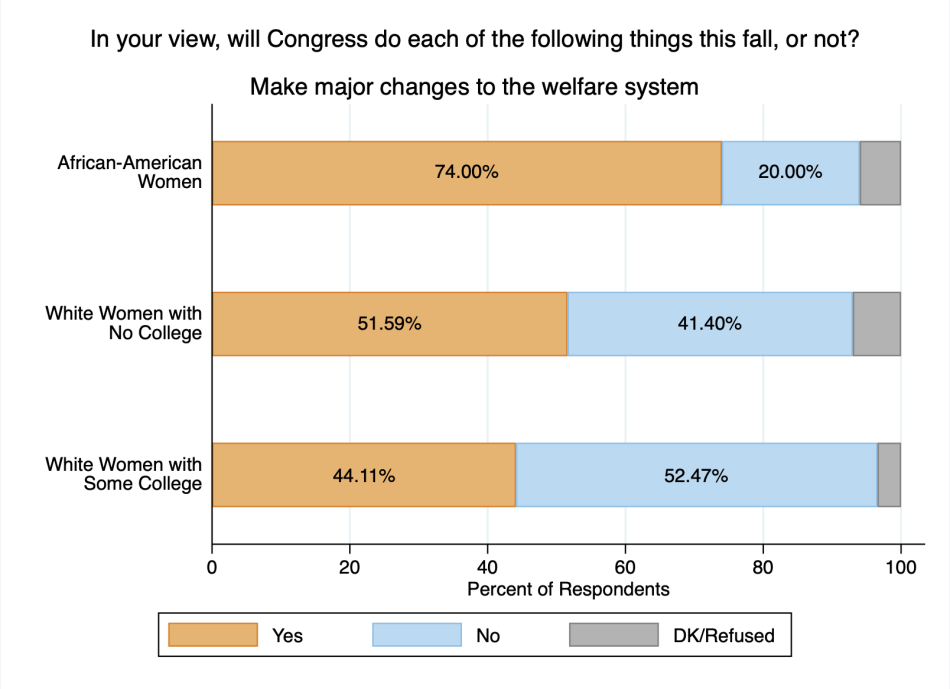
Note: Birth rates calculated as the annual number of births from the National Center for Health Statistics (1980-2005) divided by total population of women aged 15-44 from the National Cancer Institute Survey of Epidemiology and End Results (SEER) population Data.

Figure 2: Gallup Poll Questions on Welfare Reform

(a) January 1994

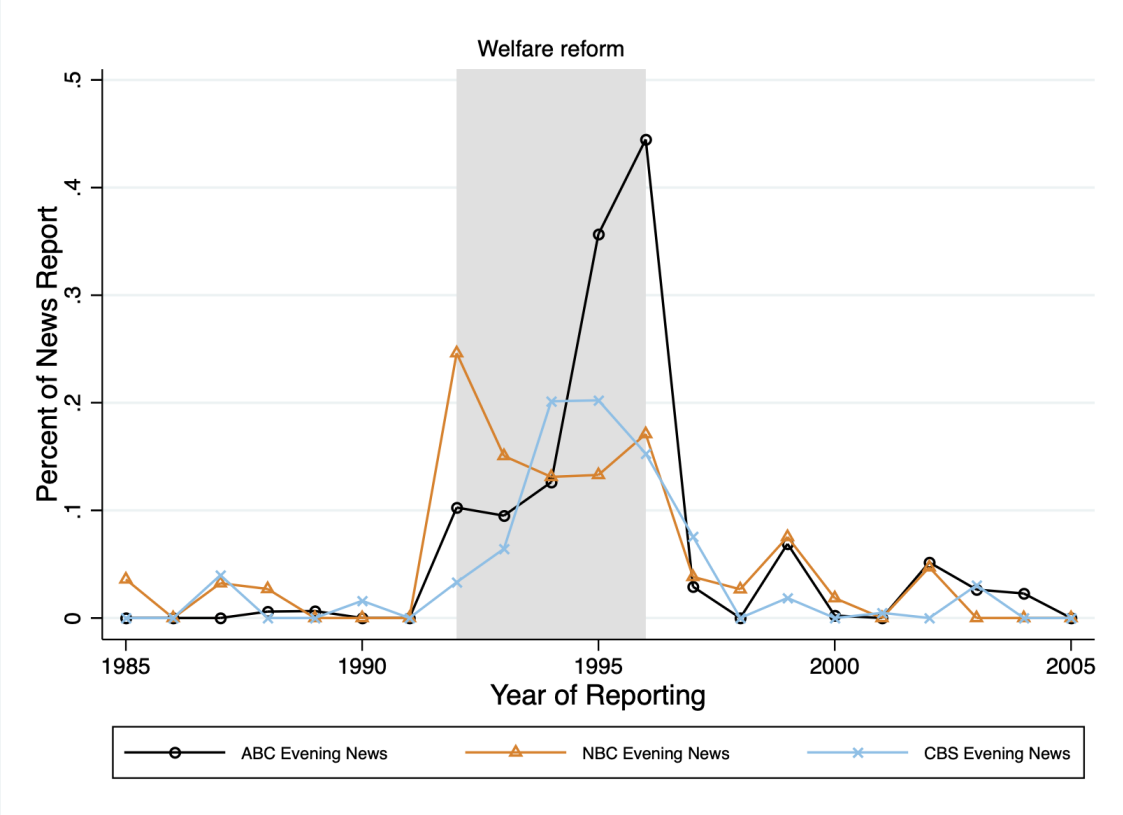


(b) August 1995



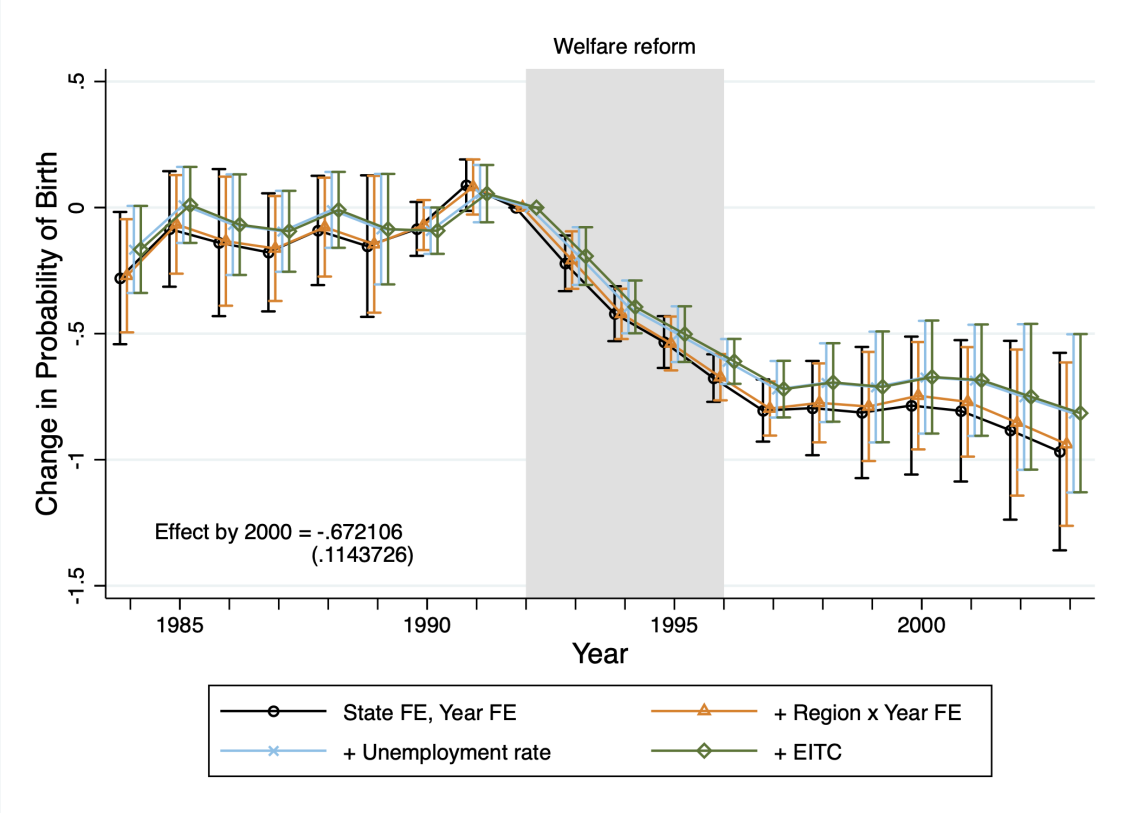
Note: Data from Gallup Organization Polls: January 1994 and August 1995, accessed through the Roper Center.

Figure 3: News Stories on Welfare Reform, Percent of Total News Minutes



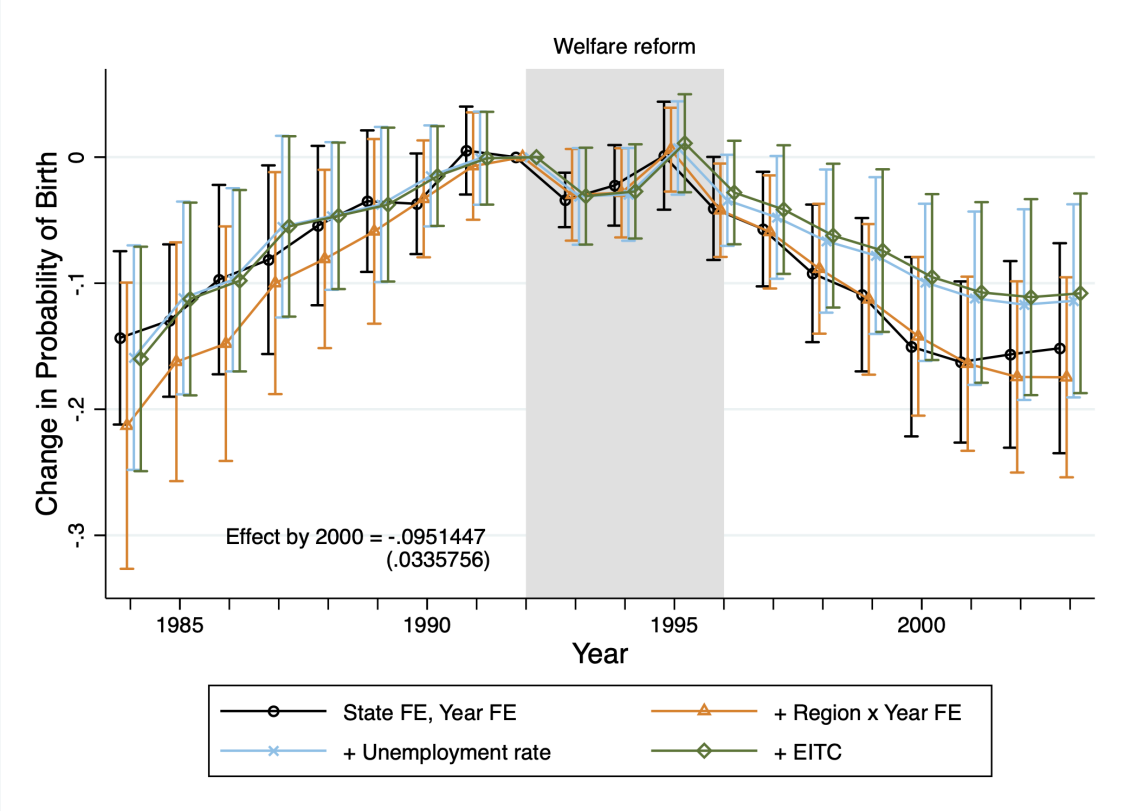
Note: Data on ABC, NBC, and CBS Evening News Reports from 1985-2005 from https://tvnews.vanderbilt.edu, accessed April 24th, 2022. Welfare Reform Related News Reports determined by news report mentions of terms "welfare" and "reform". Missing years for ABC, NBC, and CBS Evening News indicate zero mentions of Welfare Reform Related terms by the station in that year. Total News Reports include Commercials during the evening news broadcast, introduction and goodnight segments of the evening news.

Figure 4: Event Study: Effects of Likelihood of Welfare Use on Probability of Birth



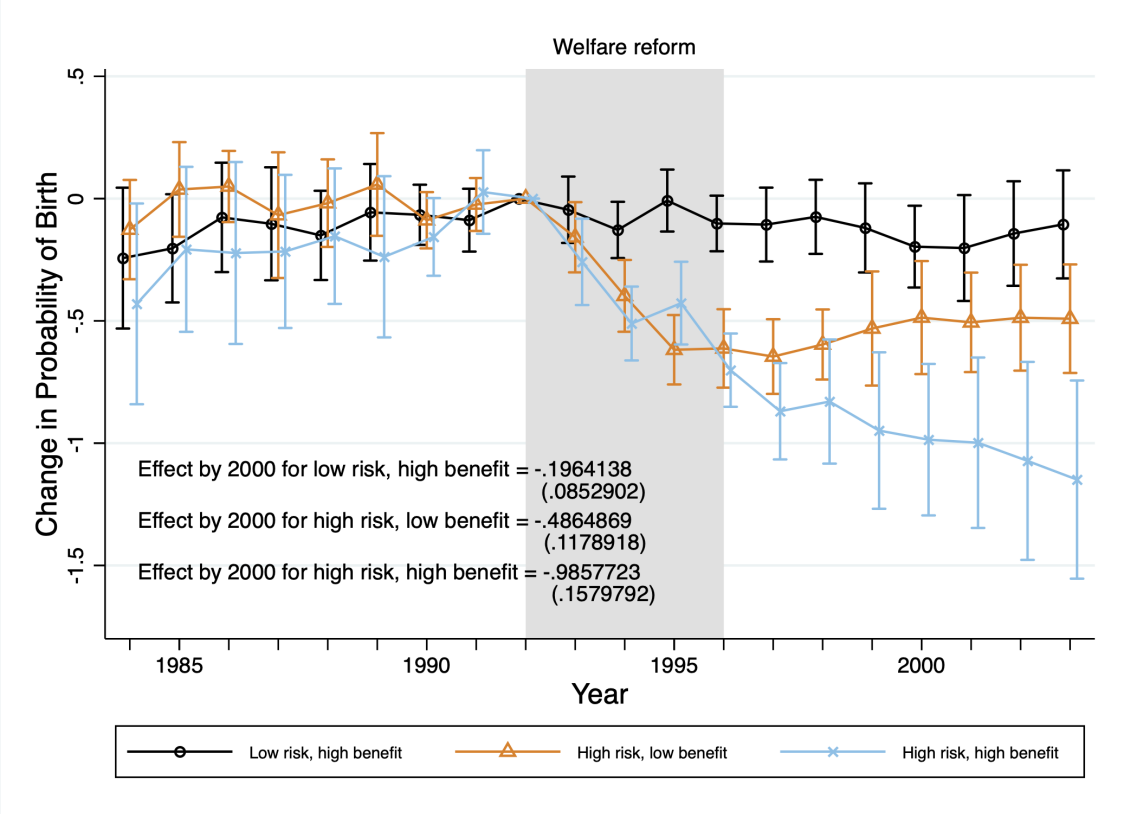
Note: The graph plots the coefficient estimates β_k based on Equation 2. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women with high likelihood of welfare use compared to the change for women with low likelihood of welfare use. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is defined as having predicted welfare use below the mean. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level.

Figure 5: Event Study: Effects of Benefit Generosity on Probability of Birth



Note: The graph plots the coefficient estimates β_k based on Equation 3. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women when the pre-reform welfare benefit in their state increases by 100 dollars. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level.

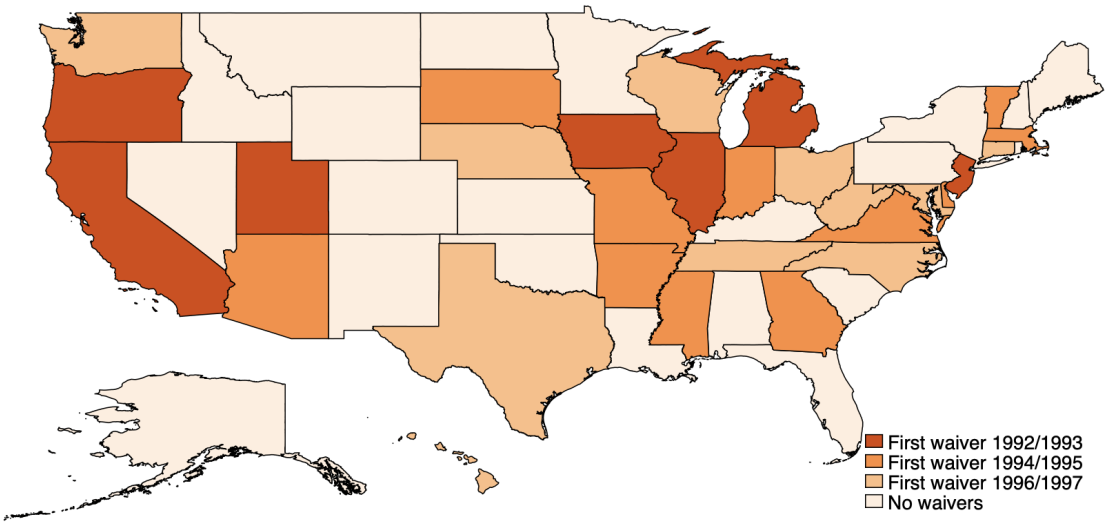
Figure 6: Event Study: Effects of Likelihood of Welfare Use and Benefit Generosity on Probability of Birth



Note: The graph plots the coefficient estimates $\{\beta_{1k}, \beta_{2k}, \beta_{3k}\}$ based on Equation 4. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women in each likelihood-generosity group compared to the omitted group of women with low likelihood of welfare use who reside in states with low welfare benefits. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is defined as having predicted welfare use below the mean. High benefit states are the 25 states (and the District of Columbia) with the highest AFDC maximum benefit in January 1990. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level.

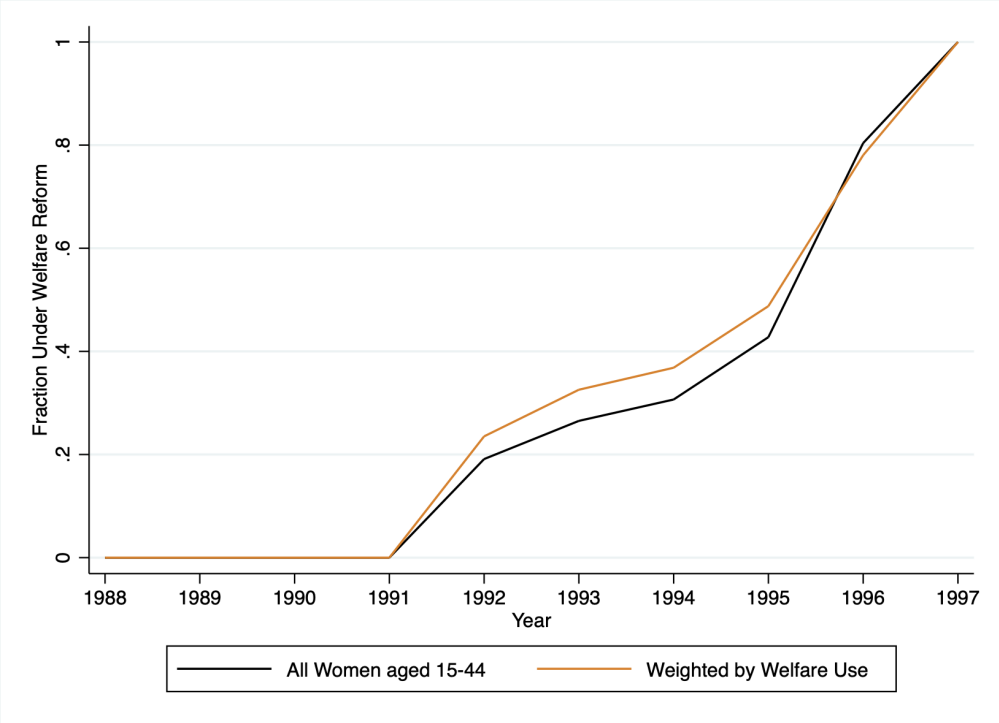
Figure 7: Geographic Variation in AFDC Waivers

(a) Implementation Year of First Major AFDC Waiver



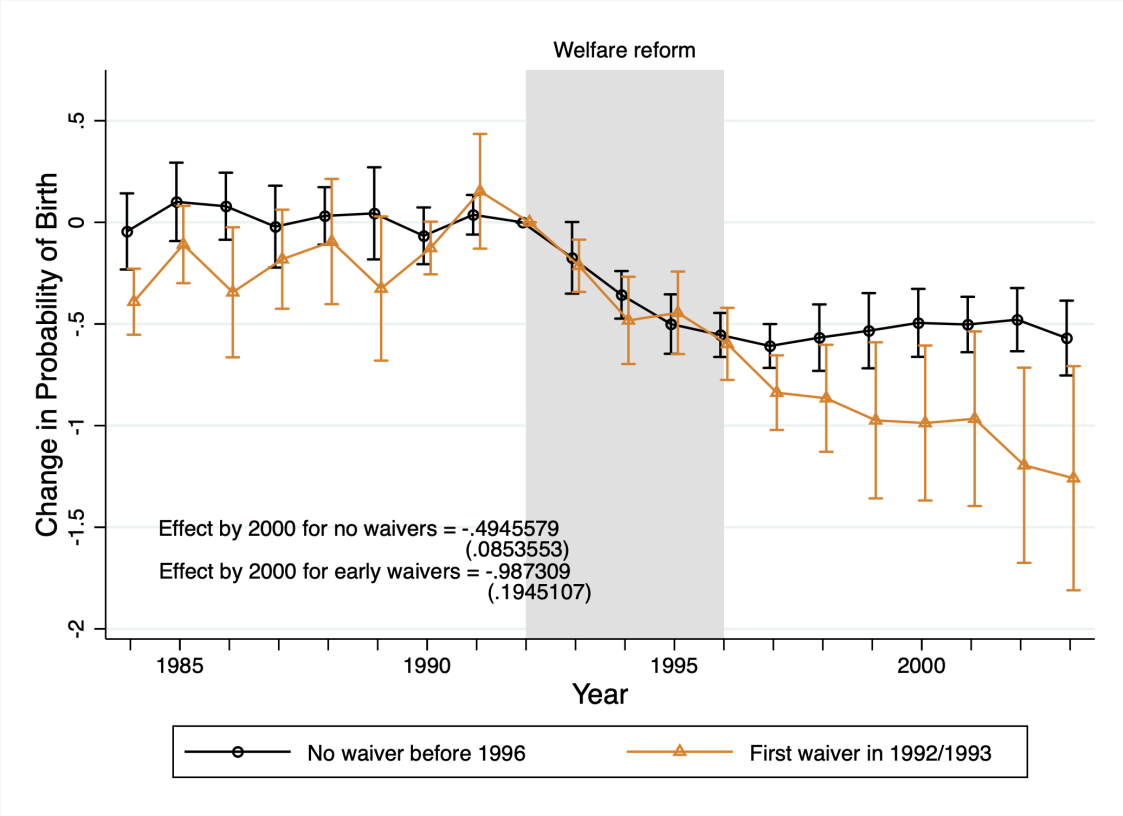
Note: Data from the *Setting the Baseline: A Report on State Welfare Waivers.*

(b) Cumulative Fraction of Women aged 15-44 Affected by Welfare Reform Policies



Note: The graph plots the fraction of women aged 15-44 under any welfare reform policies in each year. Welfare reform policies include major AFDC waivers (excluding increased earnings disregard) and implementation of TANF. Population is calculated as the total population of women aged 15-44 from the Survey of Epidemiology and End Results (SEER) Population Data.

Figure 8: Event Study: Effects of AFDC Waivers on Probability of Birth

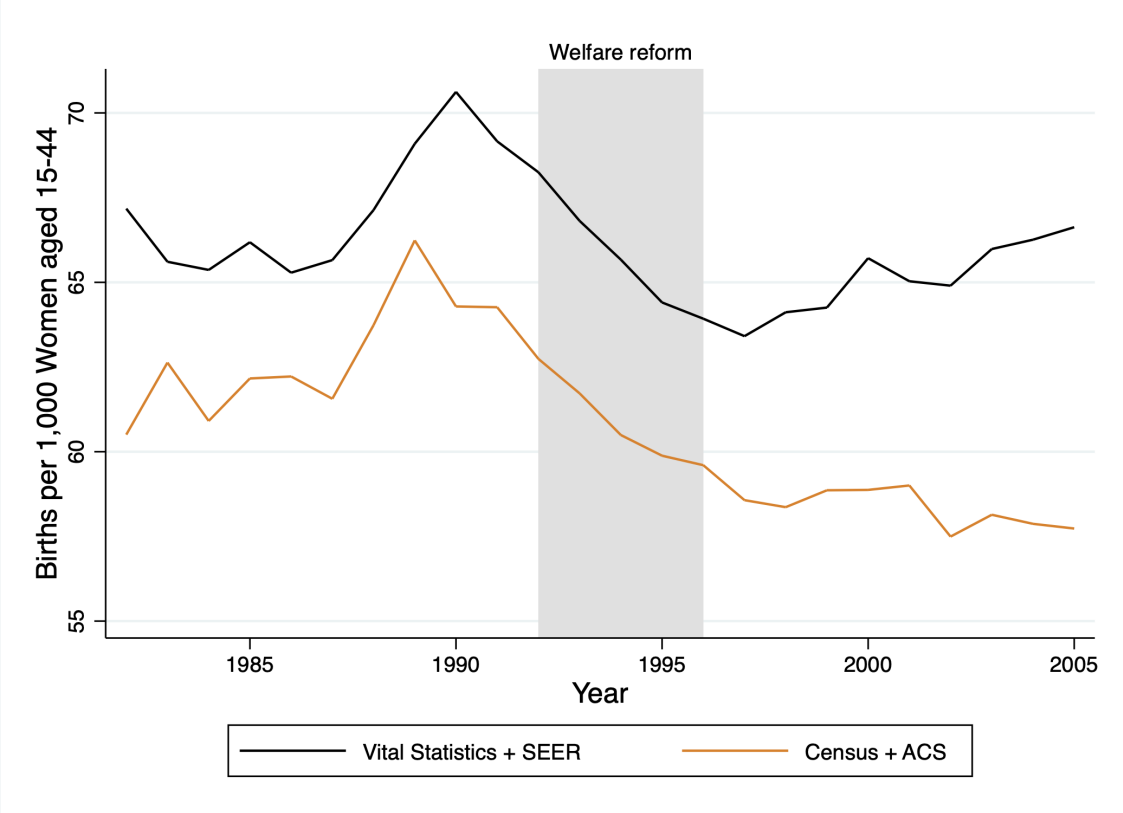


Note: The graph plots the coefficient estimates β_k based on Equation 2. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women with high likelihood of welfare use compared to the change for women with low likelihood of welfare use, within the subsample groups. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is defined as having predicted welfare use below the mean. The 95% confidence intervals are based on robust standard errors clustered at the state level. The sample includes all women aged 15-44 in states with no AFDC waivers before 1996 and states with their first major waiver in 1992-1993 respectively.

Appendix

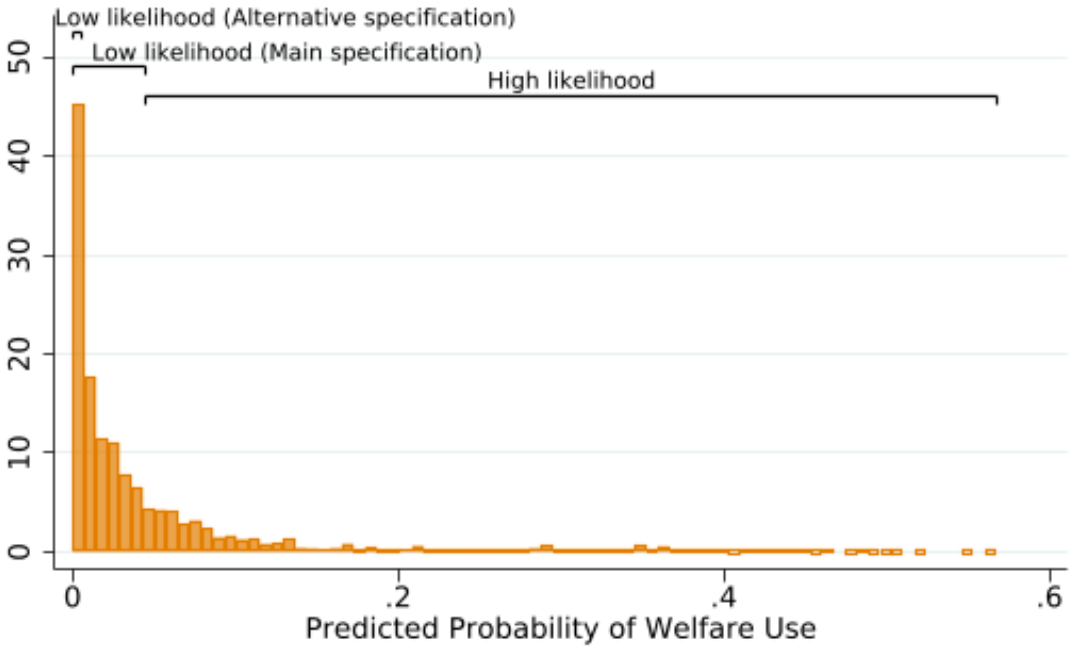
A Supplementary Figures and Tables

Figure A.1: Population and Sample Birth Rates



Note: Black solid line plots population birth rates, calculated as the annual number of births from the National Center for Health Statistics (1980-2005) divided by total population of women aged 15-44 from the National Cancer Institute Survey of Epidemiology and End Results (SEER) population Data. Orange dashed line plots sample birth rates, calculated as the weighted fraction of women aged 15-44 who gave birth in each year.

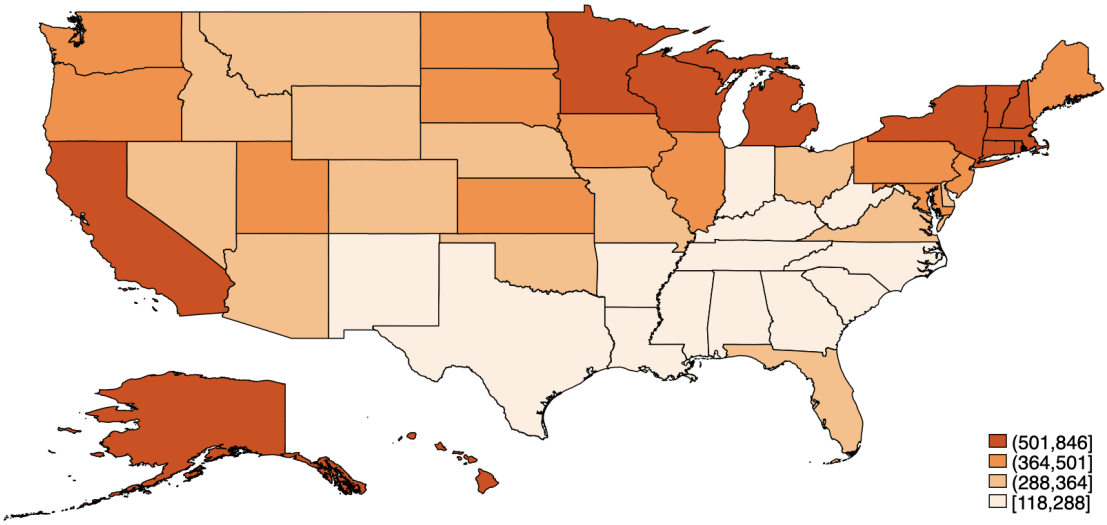
Figure A.2: Predicted Probability of Welfare Use



Note: Probability of welfare use predicted based on Equation 1. Regression run on CPS March files for the years 1986-1991 for women aged 15 to 44.

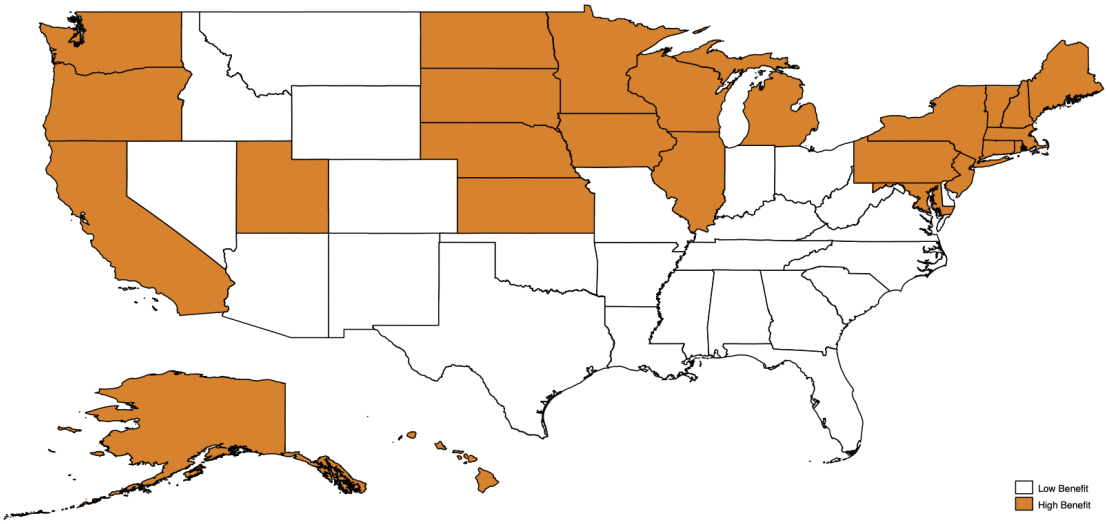
Figure A.3: Geographic Variation in AFDC Benefits

(a) AFDC Maximum Benefit in January 1990



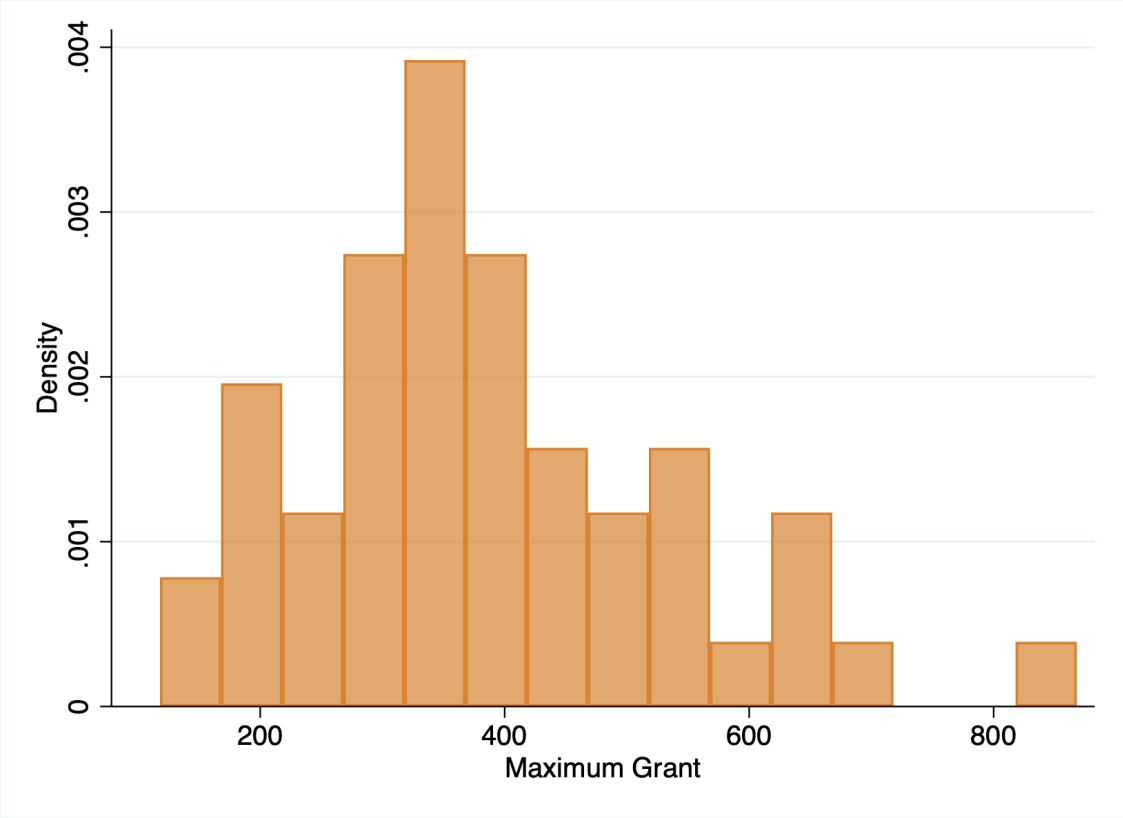
Note: Data from the *Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means* (Green Book), for AFDC Maximum Benefit for a one parent household of three people in January 1990.

(b) High and Low Benefit States



Note: High benefit states are the 25 states (and the District of Columbia) with the highest AFDC maximum benefit in January 1990.

Figure A.4: AFDC Maximum Benefit for a Three-Person Family (Jan 1990)



Note: Data from the *Background Material and Data on Programs within the Jurisdiction of the Committee on Ways and Means* (Green Book).

B Robustness of Main Results

In this section, I first repeat the main analysis as in Figures 4 to 8 using only data from the 2000 Census to check that the main results are not driven by differences in predicted welfare use across census years. Then using the same sample from the 2000 Census, I show that my results are robust to alternative definitions of high and low predicted welfare use.

First I create a sample using only the 2000 Census using a similar method as the main sample. I take the Census and identify all children aged 1 to 16 years old, matching them back to their mothers. Then, using the birth year of each child, I identify births by all women in the 1 to 16 years prior to the survey year, i.e. in 1984 to 1999. I then create a 16-year panel for the years 1984 to 1999, containing information on each women and whether or not she gave birth in that year. Finally, I restrict the sample to women between ages 15 and 44 in each year. This results in a representative sample of women of reproductive ages for the years 1984 to 1999.

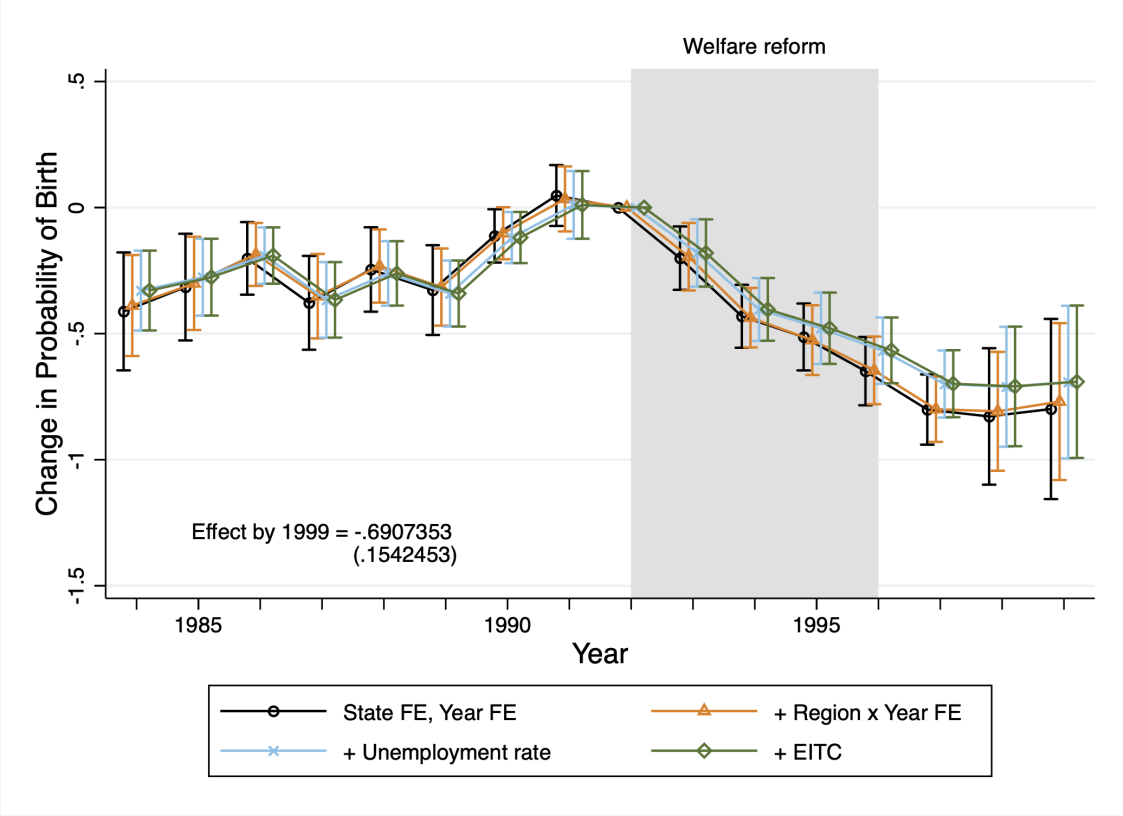
The following figures show the regression results using this alternative sample. Specifications for the regressions underlying Figures A.5 to A.7 are identical to those for Figures 4 to 8 respectively. The main results are robust to this alternative sample, showing that the results are not driven by inconsistencies in the underlying measure of predicted welfare use.

Next, I consider an alternative definition for high versus low predicted welfare use. I consider the same group of women who have predicted welfare use above the mean as those with high likelihood of being on welfare. To avoid comparing very similar women at the margin, I drop those with predicted use just below the mean. The low likelihood group consists of women with the lowest predicted welfare use such that the high and low groups are of equal size. I use the sample from above with only data from the 2000 Census here, as this specification distinguishes between women with very low predicted welfare use, and hence is particularly sensitive to inconsistencies in the underlying variables across census

years.

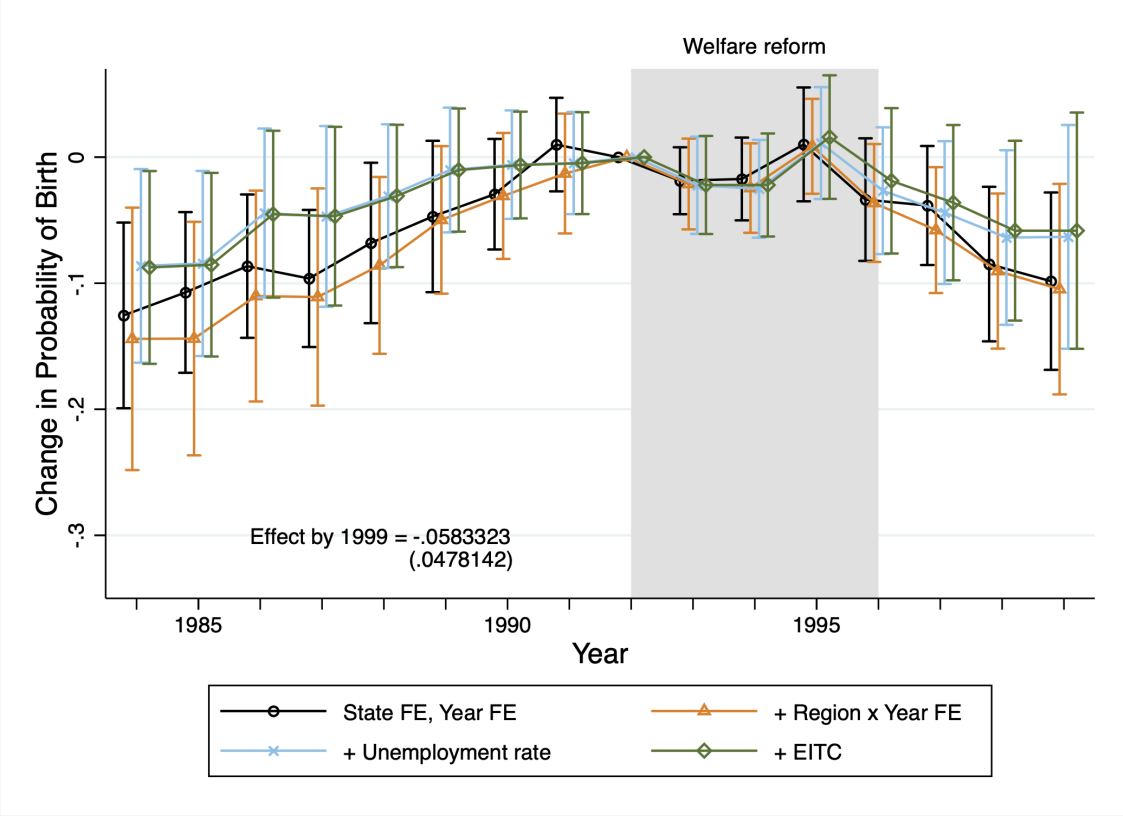
Figures A.9 to A.11 repeat the analysis in Figures A.5, A.7 and A.8 using these alternative groups. The results are robust to this alternative specification. The estimated effects are larger in all three specifications as expected, as the control group here has lower likelihood of using welfare than in the main specification.

Figure A.5: Event Study: Effects of Likelihood of Welfare Use on Probability of Birth



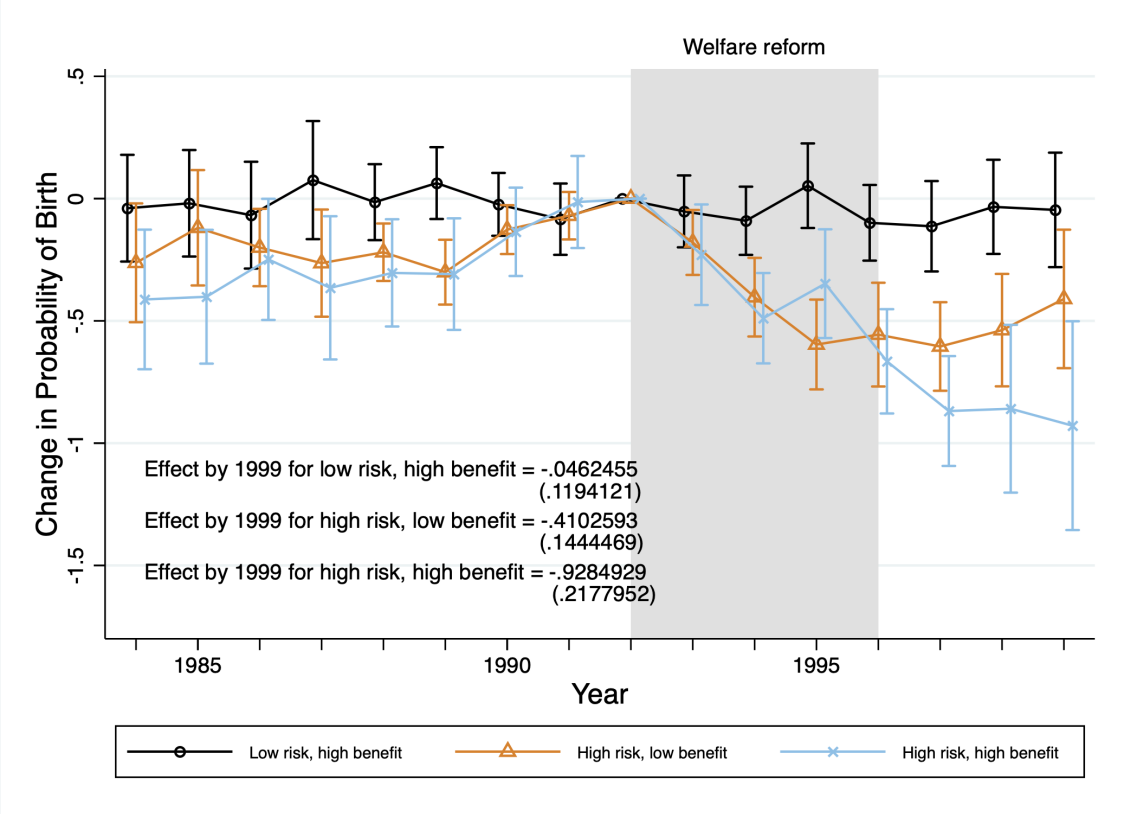
Note: The graph plots the coefficient estimates β_k based on Equation 2. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women with high likelihood of welfare use compared to the change for women with low likelihood of welfare use. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is defined as having predicted welfare use below the mean. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level. Data from 2000 Census only.

Figure A.6: Event Study: Effects of Benefit Generosity on Probability of Birth



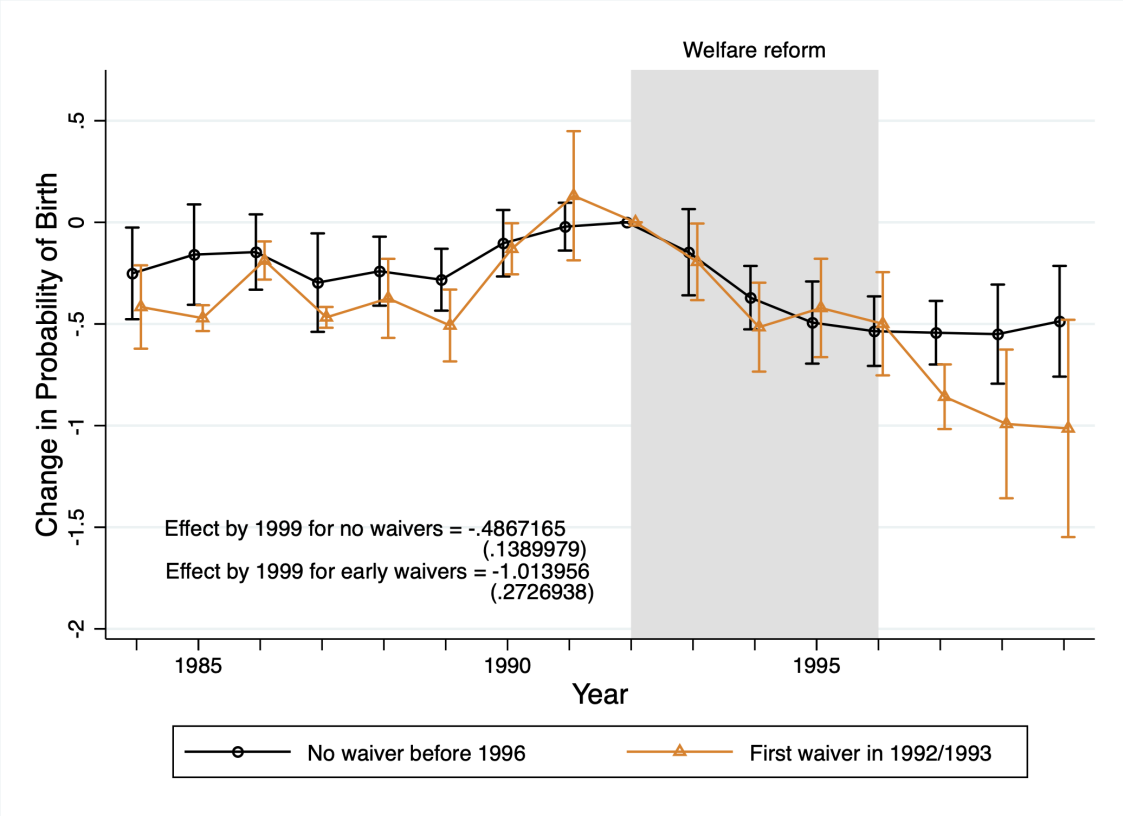
Note: The graph plots the coefficient estimates β_k based on Equation 3. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women when the pre-reform welfare benefit in their state increases by one dollar. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High benefit states are the 25 states (and the District of Columbia) with the highest AFDC maximum benefit in January 1990. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level. Data from 2000 Census only.

Figure A.7: Event Study: Effects of Likelihood of Welfare Use and Benefit Generosity on Probability of Birth



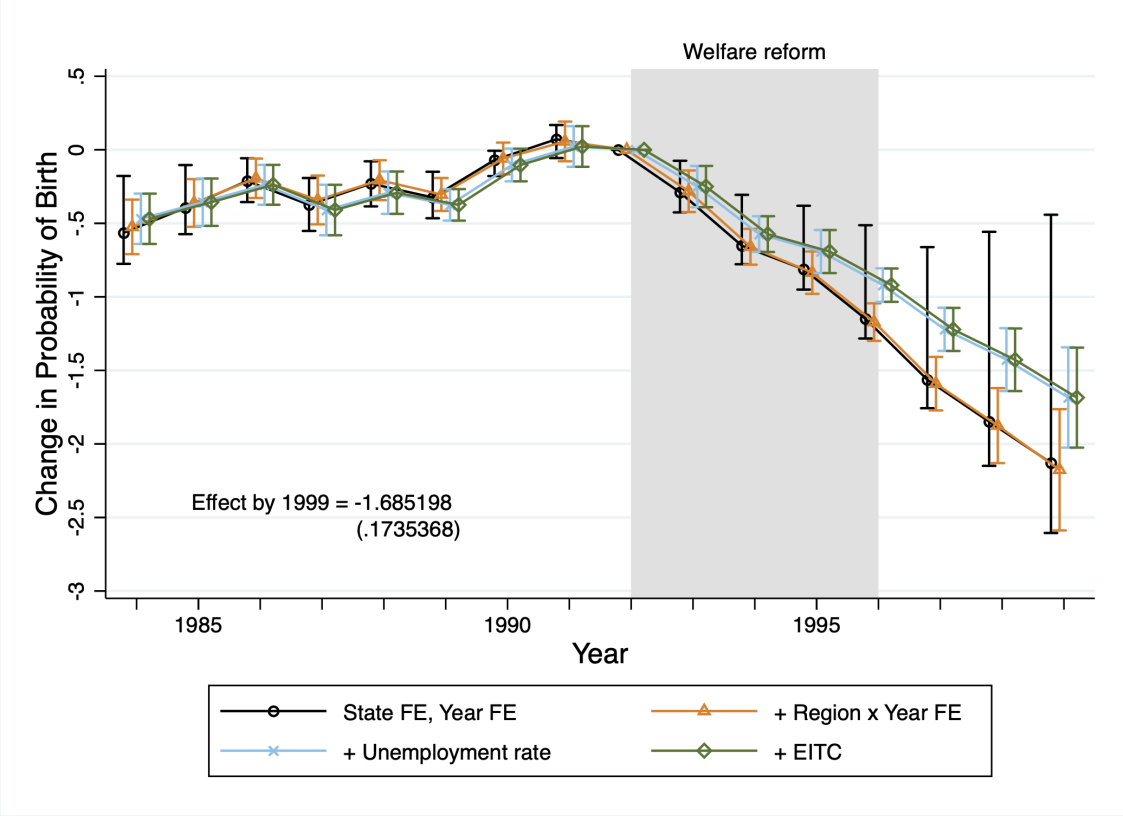
Note: The graph plots the coefficient estimates $\{\beta_{1k}, \beta_{2k}, \beta_{3k}\}$ based on Equation 4. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women in each likelihood-generosity group compared to the omitted group of women with low likelihood of welfare use who reside in states with low welfare benefits. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is defined as having predicted welfare use below the mean. High benefit states are the 25 states (and the District of Columbia) with the highest AFDC maximum benefit in January 1990. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level. Data from 2000 Census only.

Figure A.8: Event Study: Effects of AFDC Waivers on Probability of Birth



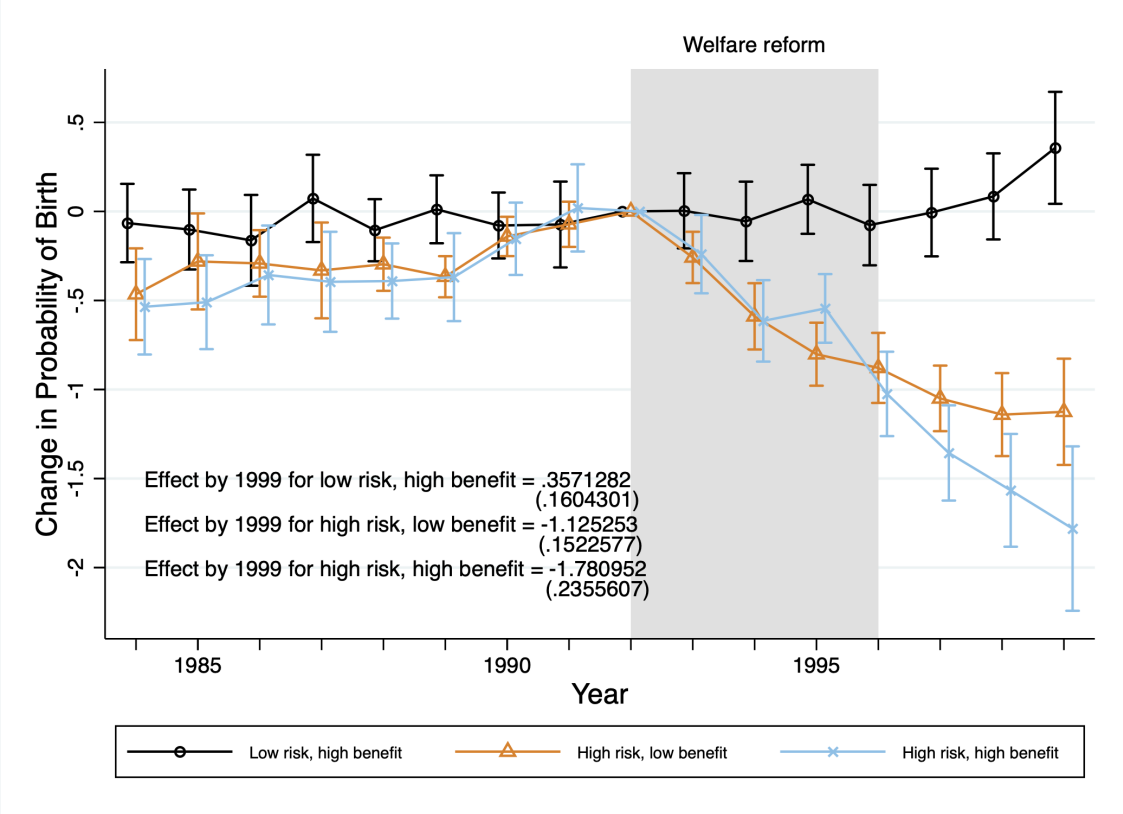
Note: The graph plots the coefficient estimates β_k based on Equation 2. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women with high likelihood of welfare use compared to the change for women with low likelihood of welfare use, within the subsample groups. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is defined as having predicted welfare use below the mean. The 95% confidence intervals are based on robust standard errors clustered at the state level. The sample includes all women aged 15-44 in states with no AFDC waivers before 1996 and states with their first major waiver in 1992-1993 respectively. Data from 2000 Census only.

Figure A.9: Event Study: Effects of Likelihood of Welfare Use on Probability of Birth



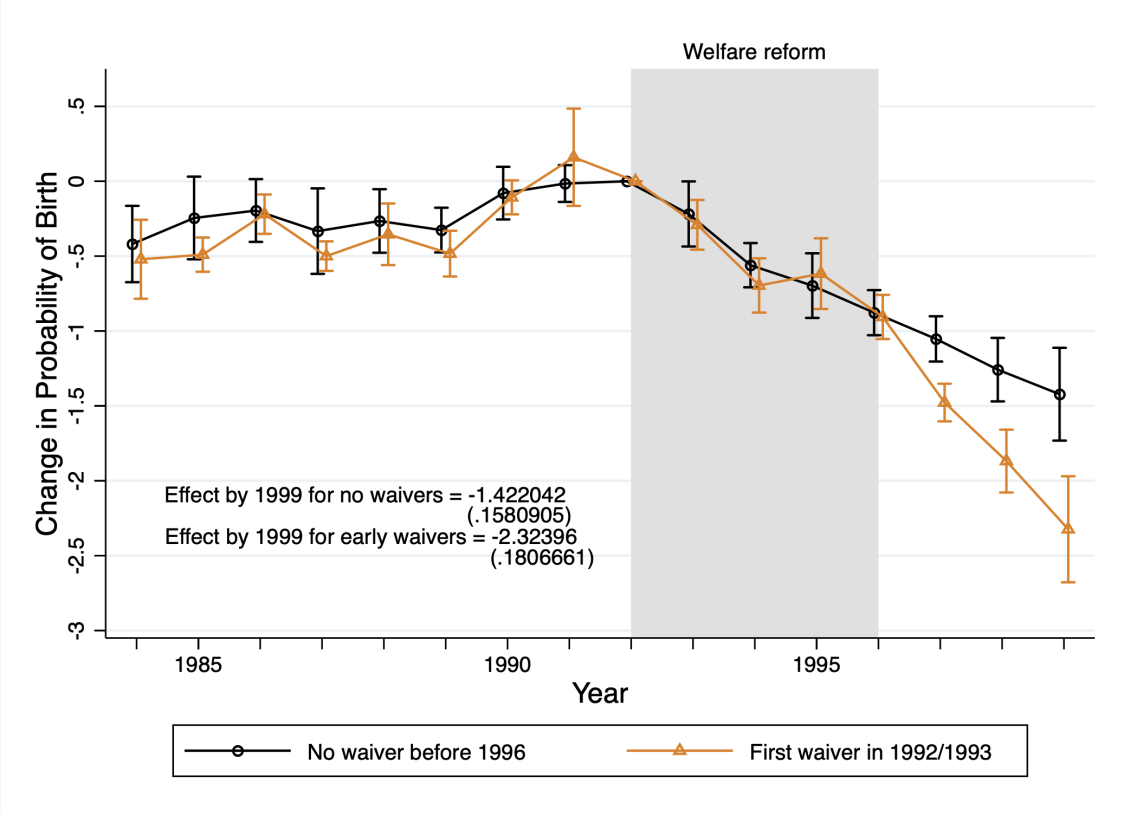
Note: The graph plots the coefficient estimates β_k based on Equation 2. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women with high likelihood of welfare use compared to the change for women with low likelihood of welfare use. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is the group of the same size that was the lowest predicted welfare use. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level. Data from 2000 Census only.

Figure A.10: Event Study: Effects of Likelihood of Welfare Use and Benefit Generosity on Probability of Birth



Note: The graph plots the coefficient estimates $\{\beta_{1k}, \beta_{2k}, \beta_{3k}\}$ based on Equation 4. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women in each likelihood-generosity group compared to the omitted group of women with low likelihood of welfare use who reside in states with low welfare benefits. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is the group of the same size that was the lowest predicted welfare use. High benefit states are the 25 states (and the District of Columbia) with the highest AFDC maximum benefit in January 1990. The sample includes all women aged 15-44. The 95% confidence intervals are based on robust standard errors clustered at the state level. Data from 2000 Census only.

Figure A.11: Event Study: Effects of AFDC Waivers on Probability of Birth



Note: The graph plots the coefficient estimates β_k based on Equation 2. Each point represents the additional percentage point change in probability of birth from 1992 to that year for women with high likelihood of welfare use compared to the change for women with low likelihood of welfare use, within the subsample groups. The dependent variable takes value 100 if a woman had a newborn in that year and 0 otherwise. High likelihood is defined as having predicted welfare use above the mean, low likelihood is the group of the same size that was the lowest predicted welfare use. The 95% confidence intervals are based on robust standard errors clustered at the state level. The sample includes all women aged 15-44 in states with no AFDC waivers before 1996 and states with their first major waiver in 1992-1993 respectively. Data from 2000 Census only.