Department of Economics

Working Paper Series

The Quantity and Quality Adjustment of Births when Having More is Not Subsidized: the Effect of the TANF Family Cap on Fertility and Birth Weight

Ho-Po Crystal Wong

Working Paper No. 15-04

This paper can be found at the College of Business and Economics
Working Paper Series homepage:

http://be.wvu.edu/phd_economics/working-papers.htm

The Quantity and Quality Adjustment of Births when Having More is Not Subsidized: the Effect
of the TANF Family Cap on Fertility and Birth Weight[§]

Ho-Po Crystal Wong
West Virginia University

February 2015

Abstract

I examine whether the family cap policy that reduces or eliminates incremental welfare benefits for additional births born to mothers already on welfare would affect both the quantity and quality of births in terms of birth weight. I find that the family cap produces very pronounced effect on reducing out of wedlock birth and low birth weight rates among teenagers. The evidence suggests that the family cap policy might not just produce a deterrent effect on non-marital childbearing but also a quality effect on birth: those births that actually occur are endowed with better health in terms of birth weight.

Keywords: TANF, AFDC, family cap, quantity and quality of children, fertility, non-marital birth, birth weight

JEL Code: J1, J12, J16, J18, K36

[§] I thank Elizabeth Cascio for her very valuable suggestion. All errors are mine.

Correspondence can be sent to: Ho-Po Crystal Wong, Department of Economics, West Virginia University. 1601 University Ave., Morgantown, WV26506, USA. Email: howong@mail.wvu.edu.

The 1990s were an era of drastic welfare reform in America. The large-scale reform was partially a response to the escalating welfare expenses shouldered by the state in the past decades: between 1960s and 1970s public expenditure on the Aid to Families with Dependent Children (AFDC) skyrocketed: the AFDC caseloads more than tripled from 1960-1971 (Grogger & Karoly 2005). There had been increasing evidence of long term dependency on AFDC. Bane and Ellwood (1983) pointed out that long-term receipts of welfare accounted for almost half of the welfare population at any point in time. In view of these trends, policymakers became increasingly concerned about the expense of AFDC on the state and the linkage between the generous welfare system and out of wedlock childbearing as the overwhelming majority of AFDC benefits are provided to unmarried mothers and their children.

One of the primary welfare reform policies aimed at promoting personal responsibility and discouraging non-marital pregnancy for women already on welfare is the “family cap” policy, which imposes a cap on the additional benefit with new-born children conceived while their mothers are on welfare.

Previous studies have attempted to examine the effect of the welfare reform in the 1990s on a wide range of demographic outcomes including female labor supply, family structure, marriage and fertility decisions. Many studies found no substantial evidence of the effect of the welfare reform. Among these studies, Levine (2002), Dyer & Farlie (2004), Joyce et al. (2004) and Kearney (2004) found that the family cap produced no significant effect on fertility using data in the 1990s. Grogger & Bronars (2001) also found no conclusive evidence for incremental welfare benefits associated with additional births born to mothers already on aid to affect the timing of subsequent births.

One of the major limitations of these studies is that they were conducted at the early stage of the reform. The inconclusive findings could simply be a result of that it takes time for the effects to materialize –individuals have to learn the new policy and its consequence so that they will incorporate the new policy into their decision making and adapt their behavior to the change and this process takes time.

In contrast, Argys et al. (2000), Horvath-Rose & Peters (2001), Horvath-Rose et al. (2008), Joyce et al. (2004) and Sabia (2008) provided evidence that the family cap lowers nonmarital

birth or overall fertility. Camasso (2004) focuses on the effect of the family cap on fertility in New Jersey and found that the cap lowered births for women who were short-time welfare recipients.

This paper adds to the findings of the existing literature on the effect of the family cap on fertility by providing a reexamination of the effect of the policy using two decades of nationwide evidence and would therefore provide a better evaluation of the long-term effect of the policy across states.

Another important contribution of this study is that it examines both the quantity and quality adjustment of birth as a result of the family cap. The existing literature has been primarily focusing on the effect of the family cap on the quantity but not the quality of birth. Given that the family cap reduces the financial incentives for mothers already on welfare to have additional births, it is theoretically possible that the cap does not only induce a change in the quantity of births but also alters their quality, as mothers might adjust their input to the health of birth in response to the lowered expected family size. Secondly mothers that are affected by this financial disincentive are likely to be among the poorest households. Holding other things constant, they are more likely to carry low weight births. Therefore some low quality births in terms of birth weight might have been deterred as a result of the family cap.

Understanding the policy implication of the family cap on the quality of birth is crucial as many studies have shown a strong linkage between infant health and the later outcomes of births such as cognitive development, education attainment, health condition and earnings in adulthood (Behrman et al. 1994; Currie and Hyson 1999; Hack et al. 2002; Behrman and Rosenzweig 2004; Black, Devereus & Salvanes 2005). Changes in the quality of births among the disadvantaged population could also carry important implications on inter-generational poverty.

In this study the family cap policy is consistently shown to reduce the state level out of wedlock birth rates. The effect is particularly pronounced among the female teenage age group. In addition, it produces very profound effect on reducing the low and very low birth weight rate among teenage women aged 15-19. These empirical findings are consistent with that disadvantaged households respond to the strong financial disincentives to have additional births by having fewer children.

In addition, the quality of birth increases as indicated by a reduction in the low birth weight rates upon the introduction of the family cap. The analysis by parity indicates that the reduction in low and very low birth weight rates is primarily driven by the reduction in the family size of the disadvantaged households as they are more likely to have low birth weight births. The findings of this paper suggest that this family cap policy could be one of the policy tools in lessening intergenerational poverty not just in terms of reducing the family size of the economically disadvantaged households, but also improved health conditions of the births that actually occur within these households.

I. Background of the Family Cap

President Bill Clinton passed the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) during his administration in the 1990s with an aim to “end welfare as we know it” (Clinton 1993): requiring work and demanding personal responsibility for individuals on welfare. Legislators and policymakers in the United States have long held the stand that marriage is an essential institution for the well-being of children. The Congress made the official statement in the findings of PRWORA (Title 1, Section 101) that “public assistance is closely related to the increase in births to unmarried women.” They also linked juvenile crime, poverty and other social problems with out-of-wedlock birth. One of the explicit goals of the reform is to reduce out of wedlock childbearing by transforming the nature of welfare. The AFDC was replaced by Temporary Assistance for Needy Families (TANF) in which the entitlement status of welfare is abolished.

Prior to the passage of the PRWORA, states were already allowed to carry out experimental welfare reform programs by seeking waivers from the AFDC program rules. According to Grogger & Karoly (2005), 29 waivers granted involved state-wide reforms, all of which were introduced between 1992 and 1996. These experimental programs include work requirements, time limits on the receipt of welfare benefits and family cap on the incremental benefit increase with new-born children conceived while their mothers are on welfare. These waivers were subsequently embodied in the TANF programs in many other states.

In particular the family cap policy aims directly at reducing out-of-wedlock childbearing through its financial disincentive for additional children conceived while the mothers are on

welfare. The policy was first introduced in New Jersey in 1992. It was subsequently adopted in 21 other states through 1998 (Sabia 2008). In 2000's, four states repealed this policy including Illinois, Maryland, Nebraska and Oklahoma (Romero & Fuentes 2010). Currently there are 20 states that embody the family cap in their TANF program.

A. The Family Cap, Quantity and Quality of Birth

Based on Becker's (1960) economic analysis of fertility, the family cap could induce a trade-off between quantity and quality of children as their relative price is changed by the policy (see also Becker & Lewis (1973) for a more complete theoretical framework). The family cap policy directly increases the price of raising an additional child for mothers on welfare. Theoretically there are two effects to be considered: the substitution effect and the income effect. The family cap no doubt would increase the price of raising additional children in the household and at the same time a reduction in subsidy would produce negative income effect. Therefore the quantity of children would drop unambiguously as the substitution and income effect reinforce each other, as long as children are normal goods.

The effect on the quality of children depends on the substitution and income effects on quality as induced by the policy. The family cap lowers the relative price of child quality, this would induce mothers to substitute quality for quantity. However, the income effect of the family cap on quality of children depends on how the cap affects the financial resources available to the average child born. If the additional financial benefit from additional births *without* the cap increases or is expected to increase the resources available to each child on average, possibly due to increasing returns to scale in childrearing, the introduction of the family cap would produce a negative income effect. Its effect on the quality of birth would then depend on the magnitude of the substitution and income effect that run in opposite directions. Child quality would go up if the substitution effect dominates the income effect and vice versa.

However if the family cap actually increases the resources available to the children born (this happens when the additional children born *without* the family cap would have squeezed out more resources from the household even with the increased cash assistance), then the substitution and income effect would reinforce each other and child quality will go up unambiguously.

In addition, poor households are more likely to respond to this change in financial incentives for raising additional children. The average quality of births is lower for these households as they are more resource-constrained, therefore we will expect that the average quality for these (potential) births that were deterred by the family cap to be lower. This creates a tendency for average birth quality to go up when the family cap is in place.

Although mothers do not have direct control over the weight of their newborns, their prenatal investment would influence the development of the fetus and child health at birth, which is positively correlated with birth weight. Factors that are found to be related to birth weights include smoking and alcohol consumption during pregnancy and prenatal health care visits (Kramer 1987). These can be viewed as inputs in the infant health production function, whose level are determined by the mother (Rosenzweig & Schultz 1983).

Conjecturally some mothers on welfare will have fewer children because of the family cap. In anticipation of the lower family size, they might increase their investment in the quality of their children including prenatal investment and this will result in increased birth weights.

It is also important to understand how policies that aim at discouraging out-of-wedlock births might affect birth weight as a large body of research suggests that birth weights play important roles in later life outcomes of children (see Hack et al.2002; Behrman & Rosenzweig 2004; Black, Devereus & Salvanes 2005).

Individual life outcomes aside, low weight births are also costly from a social standpoint. While low birth weight births only account for 8% of the total births nationwide, the hospital costs for preterm or low birth weight births represent 47% of all the costs in all infant hospitalizations (Russell et al. 2007). There are policies that directly aim at improving infant health such as the expansion of Medicaid coverage for pregnant women in the 1980's and to family planning services (Aizer and Currie 2014), but the family cap as a policy tool to improve birth outcomes of the disadvantaged families have been largely overlooked. Extensive research effort has been concentrated on the impact of family cap on the occurrence of fertility, the findings of its effect on the birth weight can offer important insight to policy makers that are concerned with the high social cost associated with low weight births and improving infant health in general.

II. The Data

A. Welfare Policies

The data on the year of implementation of the family cap policy and its repeal in some states come from Romero & Fuentes (2010). The information on the year of implementation of TANF is obtained from Schoeni & Blank (2000).¹ Data on the maximum monthly benefit for AFDC/TANF for a family of three prior to 1996 come from various issues of the *Congressional Green Book* produced by the Committee on Ways and Means of the United States House of Representatives;² the rest are collected from the *Welfare Rules Database* provided by the Urban Institute. The data on the year of implementation of caretaker work exemption and state lifetime time limit policy prior to 1998 come from Kearney (2004) and the subsequent years are updated by *Welfare Rules Databook: State TANF Policies* in various years published by the Urban Institute.

Data on the year of implementation of mandatory income withholding for child support up to 1992 come from Case (1998). I traced out the year of enactment for the rest of the states that introduced the law after 1992 from internet search engines for state statutes and codes.³

B. State Level Demographics

The state-level analysis uses natality data from *Vital Statistics of the United States*, which provide information on the occurrence of non-marital birth at state level from 1989-2012 and low birth weight birth from 1989-2010. The data are compiled by the National Center for Health Statistics (NCHS). The aggregates in the age-racial specific state-level model are constructed by the public-use microdata files from the 1989-2003 *Vital Statistics Natality Birth Data*. Unfortunately the state identifiers are no longer publicly available in the microdata since 2005

¹ For states that introduced TANF after July, I assume that its initial year of implementation to be the following year. The actual implementation year is taken as the implementation year if it is different from the official year of implementation.

² Available at <http://greenbook.waysandmeans.house.gov/archive>; the data for the maximum monthly benefit for AFDC/TANF for a family of three in 1989 is unavailable. I assume its nominal value to be the same as in 1990. It should not raise big concern because the nominal maximum monthly benefit for AFDC/TANF for a family of three in 1987 is close to that in 1990 and in many states the values are the same. In fact the nominal value of AFDC benefits has been very stable over time from 1960s through 1990s so there is a decline in AFDC benefits in real terms (Moffitt et al. 1998). This is one of the factors that accounts for the decline in AFDC caseloads in the 1980's.

³ There are 4 states that introduced the income withholding for child support law after 1992. They are Alaska (1994), Hawaii (1994), District of Columbia (1994) and Virginia (1995).

and therefore in my age-racial specific state-level model I limit my analysis using data from 1989-2003.⁴ Plural births are dropped from the sample as they tend to weigh lower and the additional births are unplanned.

Data on population by year, state, gender, race and age groups are from *the Reading Survey of Epidemiology and End Results (SEER) U.S. County Population Data*. The disposable personal income per capita was obtained from the Bureau of Economic Analysis. The data on statewide unemployment rates and CPI used to deflate income are provided by the Bureau of Labor Statistics. The data on proportion of population in poverty in each state are from National Priorities Project (NPP).⁵

Using the above data, I perform two econometric models: a state fixed effect model using only state aggregates and another one that aggregates individuals in states by age-racial groups. In the latter model, I focus on black and white women who are in the age groups: 15-19 years, 20-24 years, 25-39 years, 30-34 years. Therefore each state usually has 8 observations in each year. Observations that are aggregated from fewer than 10 observations in the micro-data are dropped from the sample. This only occurs to small states with very small number of observations in a specific group. All the regressions are weighted by the state level female population in each group.

C. The Dependent Variables

The dependent variables to be examined include the out of wedlock birth rate as a measure of the quantity of children born outside marriage; low and very low birth weight rates as a measure of the quality of birth.

In the state-level analysis, they are defined as the number of occurrences per 1000 state female population aged 15-44, which is the at-risk group for childbearing; the low birth weight rate is defined as the number of occurrences per 1000 state female population aged 15-44.

⁴ State identifiers in the micro-data of 2004 for some states are unavailable and the aggregates in some identifiable states are sharply different from the previous years. I therefore do not include the microdata of 2004 in my estimation.

⁵ The data is available at <https://www.nationalpriorities.org/interactive-data/database/>.

In the group-specific state level analysis, the out of wedlock birth rate is defined as the number of nonmarital births per 1000 state female population in the specific racial-age group. The low and very low birth weight rates are defined as the number of occurrences of low and very low birth weight births per 1000 state female population in the specific age-racial group. Low weight and very low weight births are defined as infants weighing less than 2500 grams and 1500 grams respectively.

D. The Independent Variables

The discussion focuses on the estimates of the coefficients of the family cap policy. A family cap policy is defined as states having a provision in their TANF/AFDC program that eliminates or decrease the incremental increase in cash assistance for additional children conceived while the mother is on welfare. Hypothetically it is a strong financial disincentives for mothers on welfare to carry additional births.

I also control for the implementation of other welfare policies introduced that might play a role in the quantity and quality of births. This includes the year of implementation of TANF and the maximum monthly benefit for AFDC/TANF for a family of three. Other welfare policy variables include the state lifetime time limit policy on assistance and the enactment of caretaker work exemption for caretakers providing care for their young children.⁶ Lastly I control for the year of implementation of mandatory income withholding for child support as this might alter men's incentives to have out-of-wedlock births when they are legally held accountable for child support, which in turn would affect fertility.

Other state demographic controls include the state level unemployment rate, state population in poverty. In the state-level model, I also add the proportion of black population and proportion of black women aged 15-19 in the women population aged 15-44. I particularly control for the black population and its young female group because the majority of welfare recipients are young black mothers and the fertility decision of the black population is found to respond quite differently to welfare incentives from the whites (see for instance Duncan & Hoffman 1990;

⁶ Kearney (2004) categorized the work exemption policy into three groups: exemption for mothers with an infant to six months old; as old as six months to three years old and a dummy that indicates states removed exemption based on the age of the child. In my analysis, I do not distinguish exemptions that differ by the age of the child. The estimated coefficients of the family cap policy are largely unaffected by this lumping.

Sabia 2008). All the regressions include state and year fixed effects. In the age-racial group specific state level model, I introduce dummies for each age and racial group.

E. Low Birth weight Births for Blacks, Nonmarital Marriage and the Family Cap

Figure 1 displays the annual number of low birth weight births for blacks and out of wedlock births in six selected states. For low birth weight births, I focus on blacks because the low birth weight rate among African Americans is much higher than their white counterparts.⁷ Overall different states exhibit quite distinct time trends in the number of low birth weight births and non-marital births but the numbers tend to decline in the early 90s and rebound in the late 90s and early 2000s. The top four graphs show the trends before and after the implementation of the cap in Illinois, Maryland, Nebraska and California. In particular, the number of low birth weight births for blacks and out of wedlock births decline after these states imposed the family cap. Noticeably, there are observable declining trends in these two outcomes for Texas and Pennsylvania, which have never introduced the family cap policy in the sample period. Illinois, Maryland and Nebraska repealed the family cap policy in 2000's. The repeal, if properly learnt by the public, should undo the effects of the family cap policy. Interestingly, the figures in Illinois, Maryland and Nebraska suggest that the trends in low birth weight births and out of wedlock births indeed rebound subsequent to the repeal.

IV. Research Methods

I make use of the variation in the timing of the introduction of the family cap across states to identify the effect of the law. To estimate the effect of the family cap on the quantity and quality of births, I perform the following two state-fixed effect models:

$$\begin{aligned}
 B_{s,t} = & \beta_1 FamilyCap_{s,t} + \beta_2 TimeLimit_{s,t} + \beta_3 WorkExempt_{s,t} + \beta_4 TANF_{s,t} \\
 & + \beta_5 \ln(Benefit)_{s,t} + \beta_6 IncomeWithhold_{s,t} + \sigma' X_{s,t} + \alpha_s + \alpha_t + \epsilon_{s,t}
 \end{aligned}
 \tag{1}$$

where B_{st} stands for out-of-wedlock birth rate and low birth weight rate in state s in year t ; $FamilyCap$ is a dummy variable that takes 1 if state s has implemented the family cap policy

⁷ The low birth weight rate for black was 13.6% compared to 5.8% for white births. The substantial differential in birth weight between black and white populations has not lessened in the past decades (Paneth 1995).

that eliminates or decreases the incremental increase in welfare for additional children conceived while the mother is on welfare in year t and zero otherwise; $TimeLimit_{s,t}$ is a dummy variable that takes 1 if state s has introduced lifetime time limit on AFDC/TANF assistance and zero otherwise; $WorkExempt_{s,t}$ is a dummy variable that indicates whether state s has introduced work exemption for mothers with an infant; $TANF_{s,t}$ is a dummy variable that takes one if state s has replaced their AFDC program by TANF program in year t ; $\ln(Benefit)_{s,t}$ is the natural logarithm of the maximum monthly benefit for AFDC/TANF for a family of three in state s in year t ; $IncomeWithhold_{s,t}$ is a dummy variable that takes 1 if state s has introduced income withholding for child support in year t and zero otherwise; $\mathbf{X}_{s,t}$ is a vector of state-level demographic controls including proportion of black people population, proportion of population in poverty, unemployment rate, proportion of African American women aged 15-19 in women population aged 15-44 in state s in year t ; α_s and α_t capture the state and year fixed effect respectively and ϵ_{st} is an iid error term.

$$\begin{aligned}
B_{r,a,s,t} = & \sum_{a=1}^4 \kappa_a Age_a * FamilyCap_{s,t} + \delta_2 TimeLimit_{s,t} + \delta_3 WorkExempt_{s,t} + \delta_4 TANF_{s,t} \\
& + \delta_5 \ln(Benefit)_{s,t} + \delta_6 IncomeWithhold_{s,t} + \delta_7 Black + \sum_{a=1}^4 \theta_a Age_a + \boldsymbol{\gamma}' \mathbf{X}_{s,t} \\
& + \rho_s + \rho_t + \epsilon_{s,t}
\end{aligned} \tag{2}$$

Regression (2) differs from Regression (1) in that rather than using state aggregates, the outcome variables are aggregated by racial-age groups in each state and year. Therefore $B_{r,a,s,t}$ stands for the out of wedlock birth rate, low and very low birth weight rate of racial group r and age group a in state s in year t . The racial groups include black and white and age of women are grouped into 4 groups: 15-19 years; 20-24 years; 25-29 years and 30-34 years. $Age_a * FamilyCap_{s,t}$ stands for the interaction term of age group a with the family cap dummy. In addition to the policy and state demographic controls used in Regression (1), I include separate dummies for the racial group and age groups as denoted by $Black$ and Age_a .

The reason for employing two econometric models is that the state identifiers in the natality micro-data become unavailable to public after 2004 and therefore I am unable to construct age-

racial-state aggregates for years after 2004. Regression (1) relies only on state aggregates allows for a longer term evaluation of the effect of the family cap policy. The major drawback is that the estimates are the average effects on the whole state female population aged 15-44. This could confound the results if for instance, the family cap policy only affects a subgroup of the population or affect the subgroups in different ways. Since the family cap policy mostly affects the disadvantaged population that is more likely to be welfare recipients, the true effect of the policy on this subgroup conceivably is stronger than its average effect on the whole state female population at childbearing age. Nonetheless, the estimates of Regression (1) can serve as a benchmark or lower bound of the effect on the targeted group. I will compare these benchmark results with the estimates using Regression (2), which better addresses the potential differential effects of the law on different female subgroups in the population, but is limited by a shorter sample period.

V. The Results

A. Quantity Adjustment

The first two columns of Table 1 present the estimates of the effect of the family cap on out of wedlock birth rates based on state level data from 1989-2012 using Regression (1). The result suggests that the family cap significantly reduces the out of wedlock birth rate. And the effect is in the range of -0.93 to -2.05 per 1000 state female population aged 15-44 depending on the specification. This corresponds to a 4.1 percent to 8.9 percent of the sample mean and the estimates under two specifications are both statistically significant.

Table 2 provides the estimates of Regression (2) using state aggregates by age-racial groups. Columns (1) and (2) look at the average effect of the family cap policy on out of wedlock birth rates on each age group. The point estimates are negative but the effect is only statistically significant when the linear state time trend is included. The family cap is found to reduce nonmarital birth rate by 0.69 per 1000 female population in each age-racial. This is a 5.4 percent of the sample mean, which is quite close to the state level estimate in specification (2) of Table 1.

Specifications 3 and 4 in Table 2 estimate the differential effects of the family cap law on different female age groups by interacting the policy with the four age groups in the sample. Conjecturally the teenage female group would be the most responsive to the family cap as this

population group on average has lower education attainment and income. The results confirm this. The family cap produces a very pronounced effect in reducing non-marital birth rate for the teenage group. The reduction ranged from -3.6 to -4.8 per 1000 female population aged 15-19, which amounts to 10-13 percent of the sample mean of the out of wedlock birth rate of this age group. The family cap policy also substantially reduces the out of wedlock birth rate for women in the 31-34 age groups. But there is no strong evidence that it reduces the out of wedlock birth rate of the age groups 20-24 and 25-30. In fact, specification (4) shows that the family cap increases the out of wedlock birth rate of the 20-24 age group by 2.73 per 1000 female in the group, however the effect is not robust across specifications.

B. Quality Adjustment

As displayed in Columns 3 and 4 of Table 1, the estimates of Regression (1) on the effect of low birthweight rate do not provide strong evidence that the family cap affects the low birth weight rate. Columns 1 and 2 of Table 3 show the estimates using the state-age-racial aggregate data. For all the estimates, the point are negative but statistically insignificant across specifications.

Columns 3 and 4 examine whether the family cap affects different age groups non-uniformly by interacting the family cap with the age groups. Again I find that the family cap produces substantial effect on teenage women group. In particular, it reduces the low birthweight rate by 0.35 in this group. This finding is robust across specification.

Table 4 further examines the effect of the family cap on very low birthweight rate, which is defined as infants weighing less than 1500 grams. The results are similar to those on low birthweight rate. Noticeably the family cap lowers the very low birthweight rate by 0.11 per 1000 female population in this age group, which amounts to a substantial 14.6 percent of the sample mean of very low birthweight rate of this age group.

C. Results by Parity

This subsection seeks to better understand the pathways through which the adjustments in quantity and quality of birth occur. One limitation of this analysis is that the birth order information of some births is missing. Even though the number of births with missing birth order

information only accounts for less than 1 percent of the sample, the birth rate by parity constructed based on birth counts is necessarily underestimated as can be observed by comparing the summary statistics in Table 2 and 4 of Appendix I. To the extent that the missing information does not occur systematically depending whether the states adopt the family cap policy, the qualitative interpretation of the estimates would not be affected.

As the family cap policy affects the cash benefit of having *additional* children born to households that are already on welfare, the occurrence of the first non-marital birth should not be significantly affected by the policy. However the policy might affect the timing of births. Comparing the results of Columns 3 and 4 of Table 2 and Columns 1 and 2 of Table 5 we can observe a very interesting pattern: overall the family cap policy reduces the out of wedlock birth rate among the teenage age group but if we confine the sample to first child, the results suggests that it increases the out of wedlock birth rate for *first birth* among the age group 20-24. This suggests that in response to the family cap policy, some teenage mothers might have postponed their first birth. Based on the results however, we could not exclude the possibility that some women in the older age group might have chosen to have their first birth earlier as a result of the family cap.

Focusing on the higher order births, the findings are in line with the main results in Columns 3 and 4 of Table 2. The family cap substantially reduces the out of wedlock birth rate for the higher order birth for the teenage and age group 31-34 and such effects are in most case statistically insignificant for the *first child*. This provides strong evidence that the results I find are indeed causal effects of the family cap.

The by-parity estimates are also helpful in understanding the mechanism through which the reduction in low birthweight rates occur. Theoretically there are two channels: first, in anticipation of the reduction in family size, mothers might increase their prenatal investment in their birth, particularly their first birth. If such channel is important, we will be more likely to observe a significant reduction in low birthweight birth rates for the first birth. Secondly, if the reduction in low birth weight rates primarily comes from a reduction in fertility among the most disadvantaged households who are more likely to carry low birthweight births, the negative effect of family cap on the low birthweight rates should concentrate on the higher order births, and most likely among the teenage group, as on average they have the lowest earning power. The

results in Tables 6-7 for both low and very low birth weight rates are in line with this hypothesis. The family cap policy significantly lowers the low and very low birthweight rates among the teenage women. Taken together, the evidence suggests that the reduction in low birthweight rates primarily come from the deterrence of birth with lower endowment as a result of the family cap. There is no strong evidence to support that mothers alter their prenatal input for births conceived but mothers might have changed their timing of births with the family cap.

D. The Effect of the Repeal as an Exogeneity Test

Kearney (2004) performed two empirical tests that support the family cap policy to be exogenous to birth rate trends. In addition to her tests, I make use of the repeal of the family cap in four states during the sample period to test if the effects found indeed come from the family cap. The repeal, if properly learnt by the public, should reverse the effects of the family cap policy. As an additional exogeneity test, I control for the family cap repeal by including a binary variable that takes one for states that have repealed the family cap policy in year t and zero otherwise in estimating Regression (1). If the effects found are indeed driven by the family cap policy, the estimate of the effect of the repeal should not be statistically discernable from zero.

Table 1 shows except for specification (2) on the out of wedlock birth rate, the effect of the repeal is statistically indistinguishable from zero. It is also possible that some individuals are not aware of the repeal and so their behavior was not altered by it. But overall we do observe that the estimated coefficients of the repeal are either weaker than the estimated coefficients of the family cap or is statistically insignificant.

VI. Summary and Conclusion

This paper examines the effect of the family cap on the quantity and quality of births using the Vital Statistics state level natality birth data that span from 1989-2012 as well as its microdata from 1989-2003. The economics behind the effect of the family cap on fertility, particularly the fertility among the disadvantaged group is clear: the family cap produces a very strong financial disincentive for mothers on welfare to carry additional children and thus overall fertility is expected to drop with the family cap. Yet the existing empirical evidence of such effect has been mixed.

The relatively longer time span of the data used in this paper enables us to better understand the long term effect of the family cap policy. I find a very profound and robust effect of the family cap in reducing out-of-wedlock childbearing. My results provide additional support for the findings in Argys et al. (2000), Horvath-Rose & Peters (2001), Joyce et al. (2004) and Sabia (2008), which stand in contrast to Kearney (2004) and Grogger & Bronars (2001). The latter finds no evidence for the effect of incremental welfare benefits on fertility.

One aspect of the family cap policy that appears to have been overlooked in the literature is its potential effect on the quality of children born. I find that the family cap gives rise to a reduction in the low and very low birth weight rates among the teenage female group. The analysis by parity indicates that such reduction primarily come from the lowering in fertility by the most disadvantaged households that are more likely to have low birthweight births.

The pronounced negative effect on very low birth weight rates is of particular importance as very low birth weight is associated with much higher mortality rate and worse long term health condition. The results also imply that the family cap could to some extent lessen the inequality in health between the economically advantaged and disadvantaged group and reduce intergenerational transmission of inequality by a reduction in family size and improvement of health outcomes of births among the disadvantaged group. The undesirable social implication of such transmission of inequality has been highlighted by Aizer and Currie (2014).

Remarkably, among the welfare policies examined: the family cap, the implementation of TANF, state lifetime time limit policy on assistance, caretaker work exemption and mandatory income withholding for child; the family cap policy is the only policy that consistently produces negative and significant effects on both out of wedlock birth and low birth weight rates across all model specifications. This indicates that the family cap is a crucial policy tool in altering fertility decision, particularly of mothers that are on welfare. As pointed out by Horvath-Rose et al. (2008), one of the major drawbacks in using aggregate data is that we do not have separate information on the births by mothers on welfare. And since this family cap conceivably would only affect the fertility decision of actual or potential welfare recipients, the estimates in this paper are likely to be lower bound estimates of the true effect of the family cap on welfare mothers.

An important area for future research is to explore the changes in maternal behavior during pregnancy such as smoking and prenatal health care visits in order to directly draw more insights on the changes in prenatal investment as a result of the family cap. By the same token the family cap could affect the level of post-natal investment in children, which will further affect the later outcomes of children such as educational attainment and their income. These important questions will be left for future research and they are crucial in understanding the full effect of the family cap policy on welfare families.

REFERENCES

- Aizer, A., & Currie, J. (2014). The Intergenerational Transmission of Inequality: Maternal Disadvantage and Health at Birth. *Science*, vol.**344**(6186), 856-861
- Argys, L. M., Averett, S. L., & Rees, D. I. (2000). Welfare Generosity, Pregnancies and Abortions among Unmarried AFDC Recipients. *Journal of Population Economics*, vol.**13**(4), 569-594
- Bane, M. J., & Ellwood, D. T. (1983). Slipping Into and Out of Poverty: The Dynamics of Spells. NBER Working Paper 1199.
- Becker, G. S. (1960). An Economic Analysis of Fertility. In *Demographic and Economic Change in Developed Countries* (pp. 209-240). Columbia University Press.
- Becker, G. S., & Lewis, H. G. (1973). On the Interaction between the Quantity and Quality of Children. *The Journal of Political Economy*, vol.**81**(2), S279-S288.
- Behrman, J. R., & Rosenzweig, M. R. (2004). Returns to birth weight. *Review of Economics and Statistics*, vol.**86**(2), 586-601.
- Behrman, J. R., Rosenzweig, M. R., & Taubman, P. (1994). Endowments and the Allocation of Schooling in the Family and in the Marriage Market: the Twins Experiment. *Journal of Political Economy*, vol.**102**(6), 1131-1174.
- Black, S. E., Devereux, P. J., & Salvanes, K. (2005). From the Cradle to the Labor Market? The Effect of Birth Weight on Adult Outcomes. NBER Working Paper 11796.
- Camasso, M. J. (2004). Isolating the Family Cap Effect on Fertility Behavior: Evidence from New Jersey's Family Development Program Experiment. *Contemporary Economic Policy*, vol.**22**(4), 453-467.
- Case, A. (1998). The Effects of Stronger Child Support Enforcement on Nonmarital Fertility. In I. Garfinkel, S.S. McLanahan, D.R. Meyer, & J.A. Seltzer (Eds.), *Fathers Under Fire: The Revolution in Child Support Enforcement* (p.191-215). New York: Russell Sage.
- Clinton, W.J. (1993). "The President's Radio Address," August 7, 1993. Online by Gerhard Peters and John T. Woolley, *The American Presidency Project*.
<http://www.presidency.ucsb.edu/ws/?pid=46965>
- Currie, J., & Hyson, R. (1999). Is the Impact of Health Shocks Cushioned by Socioeconomic Status? The Case of Low Birthweight. NBER Working Paper 6999.
- Duncan, G. J., & Hoffman, S. D. (1990). Welfare Benefits, Economic Opportunities, and Out-of-Wedlock Births among Black Teenage Girls. *Demography*, vol.**27**(4), 519-535.
- Dyer, W. T., & Fairlie, R. W. (2004). Do Family Caps Reduce Out-of-Wedlock Births? Evidence from Arkansas, Georgia, Indiana, New Jersey and Virginia. *Population Research and Policy*

Review, vol. **23**(5-6), 441-473.

Grogger, J., & Bronars, S. G. (2001). The Effect of Welfare Payments on the Marriage and Fertility Behavior of Unwed Mothers: Results from a Twins Experiment. *Journal of Political Economy*, vol.**109**(3), 529-545.

Grogger, J., & Karoly, L. A. (2009). *Welfare Reform: Effects of a Decade of Change*. Cambridge: Harvard University Press.

Hack, M., Flannery, D. J., Schluchter, M., Cartar, L., Borawski, E., & Klein, N. (2002). Outcomes in Young Adulthood for Very-Low-Birth-Weight Infants. *New England Journal of Medicine*, vol.**346**(3), 149-157.

Horvath-Rose, A., & Peters, H. E. (2001). Welfare Waivers and Nonmarital Childbearing. In G. Duncan & P.L. Chase-Lansdale (Eds), *For Better and For Worse: Welfare Reform and the Well-being of Children and Families* (p.222-245). New York: Russell Sage Foundation.

Horvath-Rose, A. E., Peters, H. E., & Sabia, J. J. (2008). Capping Kids: the Family Cap and Nonmarital Childbearing. *Population Research and Policy Review*, vol.**27**(2), 119-138.

Joyce, T., Kaestner, R., Korenman, S., & Henshaw, S. (2004). Family Cap Provisions and Changes in Births and Abortions. *Population Research and Policy Review*, vol.**23**(5-6), 475-511.

Kearney, M. S. (2004). Is There An Effect of Incremental Welfare Benefits on Fertility Behavior? A Look at the Family Cap. *Journal of Human Resources*, vol.**39**(2), 295-325.

Kramer, M. S. (1987). Determinants of Low Birth Weight: Methodological Assessment and Meta-Analysis. *Bulletin of the World Health Organization*, vol.**65**(5), 663-737.

Levine, P. B. (2002). The Impact of Social Policy and Economic Activity throughout the Fertility Decision Tree. NBER Working Paper 9021.

Moffitt, R., Ribar, D., & Wilhelm, M. (1998). The decline of welfare benefits in the US: the role of wage inequality. *Journal of Public Economics*, vol.**68**(3), 421-452.

Paneth, N.S. (1995). The Problem of Low Birth Weight. *The Future of Children*, vol. **5**(1), 19-34.

Romero, D., & Fuentes, E. F. (2010). The Welfare Family Cap Policy: Fertility Restriction As Poverty Prevention. *Different Takes*, vol.**66**, 1-4.

Rosenzweig, M. R., & Schultz, T. P. (1983). Estimating a household production function: Heterogeneity, the demand for health inputs, and their effects on birth weight. *The Journal of Political Economy*, vol.**91**(5), 723-746.

Russell, R., Green, N., Steiner, C., Meikle, S., Howse, J., Poschman, K., Dias, T. Potetz, L., Davidoff, M., Damus, K. & Petrini, J. (2008). Cost of Hospitalization for Preterm and Low Birth Weight Infants in the United States. *Pediatrics*, vol.**120** (1), e1-e9.

Sabia, J. J. (2008). Blacks and the Family Cap: Pregnancy, Abortion, and Spillovers. *Journal of Population Economics*, vol.21(1), 111-134.

Schoeni, R. F., & Blank, R. M. (2000). What Has Welfare Reform Accomplished? Impacts on Welfare Participation, Employment, Income, Poverty, and Family Structure . NBER Working Paper 7627.

United States House of Representatives, Committee on Ways and Means (1994). "Section 10:Aid to Families with Dependent Children and Temporary Assistance for Needy Families." *Green Book*. Washington, DC.: GPO.

United States House of Representatives, Committee on Ways and Means (1996). "Section 8:Aid to Families with Dependent Children and Related Programs (Title IV-A)." *Green Book*. Washington, DC.: GPO.

United States House of Representatives, Committee on Ways and Means (1998). "Section 7:Aid to Families with Dependent Children and Temporary Assistance for Needy Families." *Green Book*. Washington, DC.: GPO.

Figure 1: Annual Number of Low Birth Weight Births for Blacks and Out of Wedlock Births in Selected States

Notes: “cap” denotes the introduction of the family cap policy and “repeal” refers to the repeal of the cap. The number of low birth weight births is on the left x-axis and the number of out of wedlock births is on the right x-axis. Texas and Pennsylvania have not introduced the family cap throughout the sample period.

Table 1: The State-Level Effect of the Family Cap on Out of Wedlock and Low Birth Weight Rates

Independent Variables:	Dependent Variable:			
	Out of wedlock birth rate		Low birth weight rate	
	(1)	(2)	(1)	(2)
Family cap	-2.052** (1.027)	-0.927* (0.481)	-0.117 (0.113)	-0.079 (0.097)
ln(max. AFDC or TANF monthly benefits, 3 person household)	0.476 (1.447)	-0.519 (1.270)	0.062 (0.215)	0.215 (0.187)
Introduction of TANF	-1.396* (0.796)	0.239 (0.399)	-0.105 (0.086)	-0.028 (0.052)
Caretaker Work exemption	0.637 (0.687)	0.003 (0.276)	-0.035 (0.067)	0.044 (0.047)
Lifetime Time limit	1.766*** (0.675)	0.343 (0.371)	0.180** (0.083)	0.012 (0.038)
Income withholding for child support	0.764 (1.115)	0.990 (0.695)	0.267** (0.112)	0.273 (0.205)
Poverty population proportion	18.49** (9.191)	-0.327 (4.089)	1.134 (1.356)	-1.100 (1.294)
Unemployment rate	25.21* (13.28)	37.98* (18.91)	5.823** (2.674)	3.158** (1.675)
ln(disposable income per capita)	25.70*** (7.807)	15.98*** (5.117)	3.500*** (1.031)	3.500*** (1.031)
Proportion of black population	51.50 (43.97)	-71.61 (95.89)	3.198 (7.401)	0.737 (0.986)
Black women age 15-19 as a fraction of black women age 15-44	-85.48*** (26.91)	-22.39 (13.71)	-11.12*** (3.525)	-28.16*** (19.32)
Family cap repealed	-0.886 (0.557)	-0.813** (0.370)	0.438 (0.302)	-0.042 (0.066)
State fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
State specific time trend, linear		X		X
N	1200	1200	1100	1100
R-squared	0.897	0.960	0.833	0.870

Notes: ***variable is statistically significant at 1% level; **variable is statistically significant at 5% level; *variable is statistically significant at 10% level. Robust clustered standard errors at state level are in parentheses. Data: Vital Statistics of the United States 1989-2012.

Table 2: The State-Level Effect of the Family Cap on Out of Wedlock Birth Rates by Age-Racial Groups

Independent Variables:	Dependent Variable:			
	Out of wedlock birth rate			
	(1)	(2)	(3)	(4)
Family cap	-1.837 (1.200)	-0.689* (0.397)	-	-
Family cap* Age group 15-19	-	-	-4.753** (2.063)	-3.598*** (1.284)
Family cap* Age group 20-24	-	-	1.552 (1.564)	2.729*** (0.839)
Family cap* Age group 25-30	-	-	-1.063 (1.008)	0.106 (0.775)
Family cap* Age group 31-34	-	-	-2.891*** (1.140)	-1.730* (0.896)
ln(max. AFDC or TANF monthly benefits, 3 person household)	1.456 (0.991)	2.690** (1.151)	1.443 (1.003)	2.669** (1.157)
Introduction of TANF	-1.034 (1.021)	-0.073 (0.377)	-1.045 (1.021)	-0.082 (0.377)
Caretaker Work exemption	1.185 (0.859)	0.294 (0.239)	1.171 (0.857)	0.288 (0.241)
Lifetime Time limit	0.687 (0.631)	0.206 (0.377)	0.689 (0.631)	0.204 (0.378)
Income withholding for child support	0.771 (0.711)	-0.343 (0.786)	0.754 (0.712)	-0.377 (0.786)
Poverty population proportion	4.446 (13.34)	6.895* (4.025)	4.404 (13.36)	6.825* (4.030)
Unemployment rate	31.65 (27.65)	31.08 (25.61)	31.64 (27.67)	31.02 (25.67)
ln(disposable income per capita)	36.79** (19.41)	-2.165 (8.269)	36.80* (19.44)	-2.248 (8.317)
Controls for age and racial groups	X	X	X	X
State fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
State specific time trend, linear		X		X
N	5842	5842	5842	5842
R-squared	0.824	0.829	0.826	0.831

Notes: ***variable is statistically significant at 1% level; **variable is statistically significant at 5% level; *variable is statistically significant at 10% level. Robust clustered standard errors at state level are in parentheses. Data: Vital Statistics Natality Birth Microdata 1989-2003.

Table 3: The State-Level Effect of the Family Cap on Low Birth Weight Rates by Age-Racial Groups

Independent Variables:	Dependent Variable:			
	Low birth weight rate			
	(1)	(2)	(3)	(4)
Family cap	-0.061 (0.112)	-0.054 (0.069)	-	-
Family cap* Age group 15-19	-	-	-0.349* (0.202)	-0.352*** (0.138)
Family cap* Age group 20-24	-	-	-0.009 (0.291)	-0.009 (0.233)
Family cap* Age group 25-30	-	-	-0.080 (0.110)	-0.078 (0.115)
Family cap* Age group 31-34	-	-	0.169 (0.160)	0.172 (0.207)
ln(max. AFDC or TANF monthly benefits, 3 person household)	0.227 (0.224)	0.161 (0.122)	0.232 (0.225)	0.166 (0.123)
Introduction of TANF	-0.150 (0.104)	-0.059 (0.045)	-0.148 (0.103)	-0.057 (0.045)
Caretaker Work exemption	0.083* (0.043)	0.074*** (0.020)	0.081* (0.042)	0.072*** (0.020)
Lifetime Time limit	0.110* (0.061)	-0.001 (0.032)	0.111* (0.060)	-0.001 (0.033)
Income withholding for child support	0.237*** (0.088)	0.113 (0.093)	0.234*** (0.088)	0.105 (0.093)
Poverty population proportion	-1.681 (1.217)	-1.027 (0.064)	-1.696 (1.215)	-1.033 (0.638)
Unemployment rate	5.350 (3.579)	1.043 (2.238)	5.387 (3.585)	1.079 (2.246)
ln(disposable income per capita)	5.266*** (1.736)	-0.828 (0.659)	5.282*** (1.756)	-0.800 (0.653)
Controls for age and racial groups	X	X	X	X
State fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
State specific time trend, linear		X		X
N	5842	5842	5842	5842
R-squared	0.817	0.820	0.818	0.821

Notes: ***variable is statistically significant at 1% level; **variable is statistically significant at 5% level; *variable is statistically significant at 10% level. Robust clustered standard errors at state level are in parentheses. Data: Vital Statistics Natality Birth Microdata 1989-2003.

Table 4: The State-Level Effect of the Family Cap on Very Low Birth Weight Rates by Age-Racial Groups

Independent Variables:	Dependent Variable:			
	Very low birth weight rate			
	(1)	(2)	(3)	(4)
Family cap	-0.007 (0.019)	-0.007 (0.012)	-	-
Family cap* Age group 15-19	-	-	-0.107*** (0.041)	-0.109*** (0.050)
Family cap* Age group 20-24	-	-	0.008 (0.051)	0.007 (0.050)
Family cap* Age group 25-30	-	-	0.026 (0.017)	0.025 (0.020)
Family cap* Age group 31-34	-	-	0.038 (0.027)	0.037 (0.036)
ln(max. AFDC or TANF monthly benefits, 3 person household)	0.047 (0.037)	0.023 (0.039)	0.049 (0.037)	0.024 (0.040)
Introduction of TANF	-0.018 (0.019)	-0.003 (0.014)	-0.018 (0.018)	-0.002 (0.013)
Caretaker Work exemption	0.005 (0.009)	0.011 (0.007)	0.004 (0.008)	0.011 (0.007)
Lifetime Time limit	0.020 (0.013)	-0.0001 (0.008)	0.020 (0.013)	0.00001 (0.008)
Income withholding for child support	0.044*** (0.015)	0.002 (0.024)	0.043*** (0.015)	-0.001 (0.024)
Poverty population proportion	-0.433** (0.211)	-0.176 (0.155)	-0.437** (0.211)	-0.178 (0.155)
Unemployment rate	1.465** (0.660)	0.518 (0.458)	1.479** (0.661)	0.533 (0.457)
ln(disposable income per capita)	0.972*** (0.337)	0.227 (0.039)	0.978*** (0.335)	-0.114 (0.184)
Controls for age and racial groups	X	X	X	X
State fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
State specific time trend, linear		X		X
N	5842	5842	5842	5842
R-squared	0.852	0.854	0.853	0.856

Notes: ***variable is statistically significant at 1% level; **variable is statistically significant at 5% level; *variable is statistically significant at 10% level. Robust clustered standard errors at state level are in parentheses. Data: Vital Statistics Natality Birth Microdata 1989-2003.

Table 5: By Parity: the Effect of the Family Cap on Out of Wedlock Birth Rates by Age-Racial Groups

Independent Variables:	Dependent Variable:			
	Out of wedlock birth rate			
	Frist birth		Second or higher order birth	
	(1)	(2)	(1)	(2)
Family cap* Age group 15-19	-1.472 (1.309)	-0.741 (0.910)	-4.116*** (1.169)	-3.242*** (0.706)
Family cap* Age group 20-24	0.932* (0.553)	1.672*** (0.384)	0.376 (1.351)	1.273 (0.875)
Family cap* Age group 25-30	-0.965* (0.554)	-0.226 (0.560)	-0.355 (1.351)	0.541 (0.476)
Family cap* Age group 31-34	-1.464*** (0.568)	-0.729 (0.527)	-1.872*** (0.667)	-0.990* (0.580)
Policy Controls	X	X	X	X
State demographic controls	X	X	X	X
Controls for age and racial groups	X	X	X	X
State fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
State specific time trend, linear		X		X
N	5582	5582	5750	5750
R-squared	0.825	0.828	0.792	0.796

Notes: ***variable is statistically significant at 1% level; **variable is statistically significant at 5% level; *variable is statistically significant at 10% level. Robust clustered standard errors at state level are in parentheses.
Data: Vital Statistics Natality Birth Microdata 1989-2003.

Table 6: By Parity: the Effect of the Family Cap on Low Birth Weight Rates by Age-Racial Groups

Independent Variables:	Dependent Variable:			
	Low birth weight rate			
	Frist birth		Second or higher order birth	
	(1)	(2)	(1)	(2)
Family cap* Age group 15-19	-0.159 (0.175)	-0.167 (0.151)	-0.258*** (0.102)	-0.243*** (0.078)
Family cap* Age group 20-24	0.006 (0.083)	-0.002 (0.060)	-0.037 (0.225)	-0.019 (0.197)
Family cap* Age group 25-30	-0.031 (0.075)	-0.037 (0.076)	-0.048 (0.086)	-0.029 (0.076)
Family cap* Age group 31-34	0.066 (0.100)	0.061 (0.113)	0.099 (0.092)	0.116 (0.112)
Policy Controls	X	X	X	X
State demographic controls	X	X	X	X
Controls for age and racial groups	X	X	X	X
State fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
State specific time trend, linear		X		X
N	5842	5582	5750	5750
R-squared	0.643	0.646	0.818	0.821

Notes: ***variable is statistically significant at 1% level; **variable is statistically significant at 5% level; *variable is statistically significant at 10% level. Robust clustered standard errors at state level are in parentheses.
Data: Vital Statistics Natality Birth Microdata 1989-2003.

Table 7: By Parity: the Effect of the Family Cap on Very Low Birth Weight Rates by Age-Racial Groups

Independent Variables:	Dependent Variable:			
	Very low birth weight rate		Second or higher order birth	
	Frist birth			
	(1)	(2)	(1)	(2)
Family cap* Age group 15-19	-0.036 (0.029)	-0.037 (0.024)	-0.085*** (0.024)	-0.086*** (0.022)
Family cap* Age group 20-24	0.017 (0.015)	0.016 (0.012)	-0.014 (0.039)	-0.015 (0.035)
Family cap* Age group 25-30	0.003 (0.010)	0.003 (0.014)	0.024 (0.018)	0.023 (0.177)
Family cap* Age group 31-34	0.010 (0.016)	0.010 (0.021)	0.026 (0.016)	0.025 (0.020)
Policy Controls	X	X	X	X
State demographic controls	X	X	X	X
Controls for age and racial groups	X	X	X	X
State fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
State specific time trend, linear		X		X
N	5582	5582	5750	5750
R-squared	0.688	0.692	0.819	0.821

Notes: ***variable is statistically significant at 1% level; **variable is statistically significant at 5% level; *variable is statistically significant at 10% level. Robust clustered standard errors at state level are in parentheses.
Data: Vital Statistics Natality Birth Microdata 1989-2003.

Appendix I: Summary Statistics

Table 1: Descriptive Statistics: State Level Aggregates (1989-2012)

Variables	N	Min	Mean	Max	Standard Error
Policy					
Family cap	1200	0	0.395	1	(0.489)
Introduction of TANF	1200	0	0.663	1	(0.473)
Maximum AFDC or TANF monthly benefits, 3 person household (in 2009 dollars)	1200	152.2	499.9	1441.6	(199.8)
Caretaker Work exemption	1200	0	0.635	1	(0.482)
Lifetime Time limit	1200	0	0.606	1	(0.489)
Income withholding for child support	1200	0	0.992	1	(0.087)
State Demographics					
Out-of-wedlock birth rate=(number of out-of-wedlock births/ state female population aged 15-44)*1000	1200	2.095	22.92	40.98	(4.783)
Low birth weight rate (1989-2010)=(number of births weighing less than 2500 grams/ state female population aged 15-44)*1000	1100	2.599	5.095	12.80	(0.886)
Poverty population proportion	1200	0.029	0.135	0.264	(0.032)
Unemployment rate	1200	0.023	0.061	0.138	(0.020)
Disposable income per capita (in 2009 dollars)	1200	17,960	31,573	48,578	(5436.1)
Proportion of black population	1200	0.003	0.130	0.379	(0.079)
Black women aged 15-19 as a fraction of black women aged 15-44	1200	0.103	0.180	0.294	(0.020)

Note: the means are weighted by state population size of women aged 15-44. Data: Vital Statistics of the United States 1989-2012.

Table 2: Descriptive Statistics: State Level Aggregates by Age-Racial Groups (1989-2003)

Variables	N	Min	Mean	Max	Standard Error
Policy					
Family cap	5842	0	0.454	1	(0.291)
Introduction of TANF	5842	0	0.442	1	(0.497)
Maximum AFDC or TANF monthly benefits, 3 person household (in 2009 dollars)	5842	152.2	525.3	1309.5	(206.3)
Caretaker Work exemption	5842	0	0.435	1	(0.496)
Lifetime Time limit	5842	0	0.429	1	(0.495)
Income withholding for child support	5842	0	0.988	1	(0.108)
State Demographics					
Out-of-wedlock birth rate=(number of out-of-wedlock births/ state female population in each age-racial group)*1000	5842	0	28.06	180.7	(28.06)
Low birth weight rate (1989-2003)=(number of births weighing less than 2500 grams/state female population in each age-racial group)*1000	5842	0	4.970	35.29	(4.970)
Very low birth weight rate (1989-2003)=(number of births weighing less than 1500 grams /state female population in each age-racial group)*1000	5842	0	0.899	22.73	(0.691)
Poverty population proportion	5842	0.029	0.132	0.264	(0.033)
Unemployment rate	5842	0.022	0.056	0.113	(0.056)
Disposable income per capita (in 2009 dollars)	5842	17,960	28,782	43,499	(4288.4)

Note: the means are weighted by state population size of women in each specific age-racial group. Data: Vital Statistics Natality Birth Microdata 1989-2003.

Table 3: By Age Groups: Descriptive Statistics of Outcome Variables (State Level Aggregates by Age-Racial Groups) (1989-2003)

Variables	N	Min	Mean	Max	Standard Error
Out-of-wedlock birth rate=(number of out-of-wedlock births/ state female population in each age-racial group)*1000					
Women age group: 15-19	1473	4.681	36.17	163.1	(21.77)
Women age group: 20-24	1519	3.671	46.18	180.7	(28.39)
Women age group: 25-30	1507	0	22.46	98.22	(15.21)
Women age group: 31-34	1463	0	10.72	82.35	(7.933)
Low birth weight rate (1989-2003)=(number of births weighing less than 2500 grams/state female population in each age-racial group)*1000					
Women age group: 15-19	1473	0	4.107	22.61	(3.049)
Women age group: 20-24	1519	0	6.532	35.02	(3.824)
Women age group: 25-30	1507	0	5.461	33.56	(2.404)
Women age group: 31-34	1463	0	3.949	35.29	(1.621)
Very low birth weight rate (1989-2003)=(number of births weighing less than 1500 grams /state female population in each age-racial group)*1000					
Women age group: 15-19	1473	0	0.754	10.49	(0.636)
Women age group: 20-24	1519	0	1.149	12.58	(0.885)
Women age group: 25-30	1507	0	0.988	13.42	(0.674)
Women age group: 31-34	1463	0	0.739	22.72	(0.480)

Note: the means are weighted by state population size of women in each specific age-racial group. Data: Vital Statistics Natality Birth Microdata 1989-2003.

Table 4: By Parity: Descriptive Statistics: State Level Aggregates by Age-Racial Groups (1989-2003)

Variables	N	Min	Mean	Max	Standard Error
First Child					
Out-of-wedlock birth rate=(number of out-of-wedlock births/ state female population in each age-racial group)*1000	5582	0	12.70	86.12	(12.72)
Low birth weight rate (1989-2003)=(number of births weighing less than 2500 grams/state female population in each age-racial group)*1000	5582	0	2.055	20.27	(1.281)
Very low birth weight rate (1989-2003)=(number of births weighing less than 1500 grams /state female population in each age-racial group)*1000	5582	0	0.358	8.403	(0.260)
Second or Higher Birth Order Child					
Out-of-wedlock birth rate=(number of out-of-wedlock births/ state female population in each age-racial group)*1000	5750	0	17.28	149.34	(16.12)
Low birth weight rate (1989-2003)=(number of births weighing less than 2500 grams/state female population in each age-racial group)*1000	5750	0	3.150	31.25	(2.332)
Very low birth weight rate (1989-2003)=(number of births weighing less than 1500 grams /state female population in each age-racial group)*1000	5750	0	0.575	27.73	(0.535)

Note: the means are weighted by state population size of women in each specific age-racial group. Data: Vital Statistics Natality Birth Microdata 1989-2003.

Appendix II: Years of the Introduction and Repeal of the Family Cap Policy

State	Year of Implementation	Year of Repeal	State	Year of Implementation	Year of Repeal
Alabama	-	-	North Carolina	1996	-
Alaska	-	-	North Dakota	1999	-
Arizona	1995	-	Ohio	-	-
Arkansas	1994	-	Oklahoma	1997	2009
California	1997	-	Oregon	-	-
Colorado	-	-	Pennsylvania	-	-
Connecticut	1996	-	Rhode Island	-	-
Delaware	1997	-	South Carolina	1996	-
Florida	1996	-	South Dakota	-	-
Georgia	1994	-	Tennessee	1997	-
Hawaii	-	-	Texas	-	-
Idaho	1997	-	Utah	-	-
Illinois	1995	2004	Vermont	-	-
Indiana	1995	-	Virginia	1995	-
Iowa	-	-	Washington	-	-
Kansas	-	-	West Virginia	-	-
Kentucky	-	-	Wisconsin	1996	-
Louisiana	-	-	Wyoming	1997	-
Maine	-	-			
Maryland	1996	2002			
Massachusetts	1995	-			
Michigan	-	-			
Minnesota	2003	-			
Mississippi	1995	-			
Missouri	-	-			
Montana	-	-			
Nebraska	1996	2007			
Nevada	-	-			
New Hampshire	-	-			
New Jersey	1992	-			
New Mexico	-	-			
New York	-	-			

Source: Romero & Fuentes (2010)

Appendix III: Year and Month of TANF Implementation

State	Year of Implementation	State	Year of Implementation
Alabama	November-96	North Carolina	January-97
Alaska	July-97	North Dakota	July-97
Arizona	October-96	Ohio	October-96
Arkansas	July-97	Oklahoma	October-96
California	January-98	Oregon	October-96
Colorado	July-97	Pennsylvania	March-97
Connecticut	October-96	Rhode Island	May-97
Delaware	March-97	South Carolina	October-96
Florida	October-96	South Dakota	December-96
Georgia	January-97	Tennessee	October-96
Hawaii	July-97	Texas	November-96
Idaho	July-97	Utah	October-96
Illinois	July-97	Vermont	September-96
Indiana	October-96	Virginia	February-97
Iowa	January-97	Washington	January-97
Kansas	October-96	West Virginia	January-97
Kentucky	October-96	Wisconsin	September-97
Louisiana	January-97	Wyoming	January-97
Maine	November-96		
Maryland	December-96		
Massachusetts	September-96		
Michigan	September-96		
Minnesota	July-97		
Mississippi	July-97		
Missouri	December-96		
Montana	February-97		
Nebraska	December-96		
Nevada	December-96		
New Hampshire	October-96		
New Jersey	July-97		
New Mexico	July-97		
New York	November-97		

Source: Schoeni & Blank (2000)