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THE IMPACT OF AFDC ON BIRTH DECISIONS AND PROGRAM PARTICIPATION

by Elizabeth T. Powers

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Abstract

Recently, New Jersey and Wisconsin eliminated the practice of increasing the AFDC benefits of families that bear additional children while on the program. Policymakers seem to accept the notion that added benefits encourage participants to bear more children, despite little direct formal evidence. This paper uses data from the National Longitudinal Survey of Women to examine the impact of both the level of AFDC benefits and the per child increment on births, as well as the effect of benefit policy and childbearing on AFDC participation. Single-equation probit estimates suggest that women on AFDC are no more likely than nonparticipants to give birth over the five years following the observation, but that those births which do occur are positively associated with incremental AFDC benefits. When birth and welfare participation decisions are estimated sequentially in a nested logit framework, AFDC benefits are found to be a significant factor in the post-birth participation decision, and empirical support emerges for the hypothesis that AFDC benefits also encourage additional births. The estimated parameters are used to simulate the impact on participation and births of eliminating incremental benefits for both new program entrants and continuing participants. Even though the specification supports the "AFDC benefits cause births" hypothesis, eliminating the new-birth increment would reduce total program costs by less than 3 percent, since both the per dollar effect of benefits on births and the per child increments themselves are small.

I. Introduction

In the past two years, an environment of sluggish economic growth and tight state budgets has led to renewed interest in welfare reform, overturning the apparent state and federal consensus on the go-slow, human-capital-oriented approach to reducing welfare dependency as represented in the Family Support Act of 1988. Many reformers have centered their proposals around the allegedly detrimental effects of the Aid to Families with Dependent Children (AFDC) program on family structure. In 1992, legislatures in New Jersey and Wisconsin voted to deny incremental benefits to AFDC recipients who bear additional children.[1] The Wisconsin law also allows AFDC recipients who marry to retain some benefits for a fixed period, even if their husbands are employed.[2] Proposals introduced but not passed into law include paying a one-time $500 bonus to AFDC recipients in Kansas who agree to be implanted with the contraceptive Norplant, and paid childbirth expenses for unwed mothers in Wyoming who agree to put their child up for adoption. Ten more states have introduced legislation linking welfare and Norplant in the past year.

What is the impetus for this seemingly sudden clamor for welfare reform? Fiscal pressures, particularly on state budgets, have undoubtedly played an important role. Nationwide, the AFDC caseload experienced largely unanticipated growth of 27 percent between 1989 and 1992, encompassing 4.8 million families by late 1992. Worsening economic prospects for low-skilled workers -- not growth in the population of female-headed households -- are primarily responsible for

[1]New Jersey does loosen the earned income restrictions on new mothers to offset the lost benefits. However, most AFDC recipients are not in the labor force and would doubtless face difficulties re-entering it soon after giving birth. New Jersey is being sued over "the $64 question" ($64 being the previously automatic per child monthly benefit adjustment) as of this writing (*Wall Street Journal* [1994]). Georgia and Arkansas have recently joined New Jersey in this "experiment," and there are motions on both the Republican and Democratic sides of the U.S. Congress to impose similar policies nationally.

[2]While men with children and some two-parent families are potentially eligible for AFDC benefits, more than 90 percent of recipient households are headed by women.

this sudden upturn. Changes in federal support for the unemployment insurance (UI) program in the early 1980s prompted many states to tighten their eligibility standards, which also aggravated the movement into welfare.[3]

In 1991, 31 states responded to the dramatic growth in welfare expenses by freezing nominal AFDC benefits, while nine others actually cut them. Growth in Medicaid program obligations also seems to have squeezed AFDC spending. Not only are health care costs difficult to control, but most state obligations to Medicaid are federally mandated but federally unfunded. Not surprisingly, other welfare programs' funding has fallen since Medicaid's introduction in 1965. Figure 1 shows that, on average, states have consistently spent about \$0.90 to \$1.00 per \$100 of personal income on all forms of welfare over the past 15 years. The shaded regions illustrate how AFDC (and other welfare) spending has shrunk as Medicaid costs have climbed.[4] On average, states devoted 12.3 percent of total expenditures to welfare by 1988, with two-thirds of that going to Medicaid.

It is little wonder, then, that following the institution of a lenient federal approval policy in 1992, many states eagerly came forward with new welfare experiments. Federal encouragement of state-level experimentation has continued even as the current administration plots its own comprehensive reform. Capping benefits regardless of the number of children may be a palatable way to limit program costs, as long as new entrants are aware of the consequences of additional births. However, the cost savings from such a policy depend on the share of program costs accounted for by per child increments and the propensity of welfare mothers (and other women who may potentially enter the program) to bear additional children. In this paper, I ask not only if there is empirical support for the common belief that AFDC policy encourages fertility, but also whether significant

[3]In 1981, the federal government instituted a 10 percent charge on states' borrowing from the U.S. Treasury to cover their UI trust funds. Many states responded by increasing their base-period earnings requirements, reducing the availability of UI to part-time and intermittently employed workers.

[4]The findings of Moffitt (1990) support the contention that *total* state welfare spending is remarkably constant over long periods and that states are quick to reduce the AFDC component of welfare spending in response to new federal programs or mandates.

budget savings arise from denying per child benefit increments.

Outline

Section II describes an economic framework for thinking about the effects of welfare on the childbirth decisions of female heads of household. This necessitates a discussion of AFDC's potential impact on marriage and labor force participation. In search of a basis for public opinion on welfare, I first use data from the National Longitudinal Survey of Women (NLSW) to compare the childbearing behavior of AFDC recipients and nonrecipients.[5] Although many stereotypes about welfare mothers are confirmed on a prima facie basis, contrary to public opinion, I find that participants are no more likely than nonparticipants to bear children. This surprising result holds up even after controlling for many other characteristics in a regression framework. However, for AFDC mothers as a group, probit models do indicate a statistically significant and positive relationship between incremental benefits and births, suggesting that *even fewer* children might be born to them if incremental benefits were reduced or eliminated.

A single-equation approach, however, ignores the fact that increased numbers of children and the presence of very young children normally enhance the likelihood of AFDC participation, independent of the benefit policy. To isolate the effect of incremental benefits on births *and* participation, the subsequent birth and participation decisions of a sample of female heads of household from the NLSW are modeled sequentially and are estimated using a nested logit model. First, I calculate the optimal AFDC participation rule as a function of family size, total AFDC benefits, and other variables. I then estimate the optimal birth choice under the assumption that post

[5] I use the words "recipient" and "participant" interchangeably to refer to a person reporting AFDC income in a given year. It is technically possible to participate in AFDC without receiving cash payments simply to qualify for Medicaid or other services associated with the program, but these cases are not discernable in the data set.

birth, the optimal participation rule will be followed. The effects of denying incremental benefits to AFDC recipients with new births on their future childbearing behavior and continued participation are simulated in a natural way in this framework, as is the effect on total participation if benefits are frozen for each family according to 1978 family size. In the concluding section, I summarize the findings and place them in the context of previous work on fertility and AFDC policy.

II. Economic Models of the Family

Because female-headed households dominate the poverty population, an understanding of marriage, birth, and work decisions is crucial for poverty policy. In this section, I discuss how AFDC benefits can affect birth, marriage, and time allocation choices.[6]

Children are assumed to yield direct utility to parents, and children's consumption may also be an argument in parents' utility functions. While current earnings are obviously affected, the primary cost of children is thought to be forgone human capital development (and hence a lower and perhaps flatter future wage profile) by the mother, who presumably devotes more time than the father to childrearing, even if married.[7] Work on the number and spacing of births focuses on the joint determination of fertility and the path of labor market returns, usually holding marital status constant. One of the first dynamic empirical treatments of this issue was by Moffitt (1984), who looked at the fertility and labor supply decisions of married women over lengthy periods and found support for this hypothesized relationship between lifetime fertility patterns and wage profiles in the NLSW data.

[6] The free or highly subsidized child care provided to working AFDC recipients has an ambiguous effect on births. On one hand, it relieves the mother of the work/child care trade-off, but at the same time, it enables human capital investment, which may lead to reduced future births. The model presented here could potentially be extended to incorporate this feature of policy as well.

[7] In the Becker (1973, 1974) marriage model, the returns to specialization of the woman in home work can be shown to be decreasing in the ratio of the wife's to the husband's wages. Most women presumably earn a lower wage than their husbands do.

In the absence of welfare, the ability of a woman to raise more children than her own income can support comes from the option of marrying a man with higher earnings. Economic models of marriage are commonly organized around the principle of comparing utility inside and outside of marriage, following Becker (1973, 1974). Because the utility from a woman's own low prospective labor market earnings is outweighed by the returns to specializing in home work and sharing her husband's income, the standard model predicts stable family relationships for low-wage women, *cet. par.*, in the absence of welfare (e.g., Johnson and Skinner [1988]). Van der Klaauw (1993) estimates a dynamic model of marriage and finds empirical support for these predictions. However, welfare may provide an acceptable alternative to marriage for low-wage women who do not want to sacrifice the enjoyment of children. Not surprisingly, studies have shown that when their own and potential husband's labor market prospects are poor, very young women tend to have children out of wedlock, subsequently supporting the new family with AFDC benefits. Welfare is also predicted to raise the probability of divorce for low-wage women by decreasing the returns to specialization in marriage and raising the level of consumption (both own and children's) attainable alone. Finally, married women who would otherwise choose to remain childless may "insure" against the income risk of divorce by having a child, thus guaranteeing contingent AFDC eligibility. Single women who would otherwise remain childless may also insure against income risk in this way.[8]

Welfare policy has implications for the timing of births as well. Consider, for instance, the effect of AFDC on an always-single woman. The option of welfare participation tends to flatten the age-income profile by smoothing downside income fluctuations. Hence, if wage profiles take on a traditional hump shape with respect to age, and if borrowing against future labor earnings is not permitted, women can also afford to bear and raise children *earlier* in life in the presence of welfare.

[8]This paper examines only the second or subsequent birth decisions of unmarried women. Thus, I do not address the insurance effect of AFDC on first births or on births to married women.

The AFDC program may encourage both married and unmarried women to space births farther apart in order to extend wage- or divorce-contingent program eligibility.

There is one possible source of savings in program costs from encouraging (or failing to discourage) births that the economic model described so far does not consider. Pregnancy potentially provides an impetus to marriage for some men and women. In this regard, it could plausibly play a positive role, since half of all program exits are accounted for by marriage (Hutchens [1981]).

III. Characteristics of Female Heads of Household

The weight of the empirical research on AFDC and family structure provides only mixed support for the notion that the program significantly affects childbirth decisions.[9] However, public opinion strongly favors the theory that AFDC policy has important and detrimental effects on the family. In a *New York Times*/CBS news poll conducted in May 1992, most respondents agreed that the welfare system encourages people to have larger families. That attitude is obviously shared and reinforced by many elected officials.

What is the basis for this opinion? Prima facie evidence from the NLSW confirms many of the hypothesized effects of welfare on fertility, and this is one way the public might form its ideas about the behavior of welfare mothers.[10] The NLSW is a panel data set that follows a group of women between the ages of 14 and 24 in 1968. Information on AFDC participation is collected in the 1978 and 1983 surveys. Table 1 presents some comparisons of the family characteristics of female-headed households both on and off welfare in 1978. The findings reveal that welfare mothers do have

[9] See Moffitt (1992) and An, Haveman, and Wolfe (1993) for discussions of the literature.

[10] I hold family structure constant in the comparison. However, it is also possible that the general public perceives female-headed households negatively, whether the family is on welfare or not. This is a potential source of additional stigma for families receiving aid.

significantly more children (34 percent on average) than nonrecipients and that they begin bearing them at significantly younger ages (AFDC recipients had their first child at around age 18, while nonrecipients on average had their first child about a year later). The shares of family sizes between the two groups are essentially reversed. While the same proportion of women in each group have two children, 47 percent of AFDC recipients have three or more children, while 44 percent of nonrecipients have only one child. AFDC recipients are more likely to have never been married and are also less likely to marry in the five years following the observation. Studies using other samples suggest that recipients tend to be younger women with younger children (e.g., Blank [1989]). This is not reflected in the NLSW data (the fraction of women with children under age six is not significantly different across the two groups) due to the age restriction on the sample.

The age spread between the youngest and oldest child is significantly higher for AFDC recipients. This is consistent with the notion that women who might use welfare may space their births farther apart to lengthen contingent eligibility. However, these figures need to be broken down by family size, since the spread is definitionally increasing in the number of births. When this is done, the only significant difference between the participating and nonparticipating groups is for female heads with three children; in this case, the age spread for nonparticipating families is nearly one year longer.

The final line of table 1 compares the guarantee across participating and nonparticipating groups. The maximum benefit or guarantee is the payment to a zero-earning family of a given size. It is the highest possible payment to the family, from which are deducted variables such as labor and property income, child support, and alimony to arrive at the final benefit payment. The mean values are for a family size of three (one parent and two children). AFDC participants tend to live in states with significantly higher guarantees. One explanation for this is that more generous benefits induce greater participation.[11] Holding family size constant, recipients live in states where benefits are on average 12 percent higher. The returns to additional children do not vary according to participation status and are as follows: 24 percent for the second child, 19 percent for the third, 15 percent for the fourth, and 13 percent for the fifth.

Subsequent Births to 1978 Female Heads

For now, let us ignore any "insurance effect" of welfare benefits, which may manifest itself in the nonparticipating portion of female-headed households. In this case, the effects of policy will be evident if there are significant differences between the childbearing characteristics of participants and nonparticipants. If welfare encourages careless contraception or the active creation of additional children, one might expect to observe marked differences in the fertility patterns of AFDC participants versus nonparticipants. Because the NLSW does not contain enough detailed participation data to hold recipiency status constant over an extended period, I compare the subsequent childbirth experiences of participants and nonparticipants as of 1978.

The first line of table 2 presents the fraction of each group bearing at least one child between 1978 and 1983 by 1978 participation status --15 percent of participants and 18 percent of nonparticipants. This difference is statistically insignificant, which might surprise those predisposed to think that life on AFDC encourages childbearing, either through direct monetary rewards or by indulging a careless lifestyle. However, it is still possible that of those women who do have children, AFDC participants have more. Though the findings in the next line refute this, it could be that the comparison is not yet specific enough. We know that AFDC mothers have more children to begin

[11]An alternative hypothesis is that high-benefit states are "welfare magnets." Gramlich and Laren (1984) find some support for significant but very small population movements in response to welfare policy. To what extent this can explain the large differences in mean benefits noted here remains an open issue.

with. Since the propensity to bear additional children might decline with family size, it may be inappropriate to compare the subsequent birth patterns of women with different family sizes in 1978. Lines 4-7 of table 2 reveal that even after adjusting for initial family size, the AFDC group is no more likely to bear an additional child than the rest of the population of female heads. In fact, although the differences are not statistically significant, the fraction of AFDC mothers giving birth is actually *smaller* than that of nonparticipants at every given initial family size. This is an intriguing result in light of the rhetoric surrounding welfare mothers and pregnancy. Finally, nonrecipients tend to be older. Further age restrictions make the difference between the two groups more pronounced, although it remains insignificant. It may be that older women have deliberately delayed conception and thus are more likely to give birth over the next five years. Because there are many other characteristics for which one should control, I shift to a regression framework below to investigate this phenomenon further.

To do this, I estimate a probit model with a binary dependent variable that equals one if a birth occurs within the next five years. The coefficient of interest is on a binary variable for AFDC participation in 1978. It is significant and positive if participants tend to have more children, all else equal. I maintain the number of children in 1978 and the age of the mother as explanatory variables and also add income, education, race, and demographic characteristics thought to affect fertility. Table 3 summarizes the findings.

Twelve variables are included in the final specification. Eight are significantly different from zero at the 10 percent level or less. The last column of the table presents the results of converting the coefficients to percentage-point changes. As expected, the mother's age significantly reduces the probability of an additional birth (by 2.3 percentage points per year), while the younger the mother is at her first birth, the less likely she is to continue to bear children over the period of interest. Significant variables having large effects on new-birth probability include race (whites are 9 percent less likely to bear additional children) and future marital status (those who marry are 14 percent more likely to bear additional children).[12] The initial number of children also significantly influences the probability of future births. Women with four or more children in the home in 1978 are the least likely to add to their families, while those with two children are more likely to bear additional children than women with only one child. The coefficients for the presence of young children, income, and education are not significantly different from zero. Surprisingly, participation significantly reduces the probability of a subsequent birth in this specification. All else equal, participants are 6 percent less likely to give birth over the next five years than nonparticipants.[13]

IV. An Ad Hoc Test for the Influence of Policy

While participants appear to be no more likely than nonparticipants to bear children over the subsequent five years, it is plausible that they would experience even fewer births if incremental benefits were unavailable. As a preliminary test of this hypothesis, I estimate a probit model identical to the one above, except that 1) the sample is split by 1978 participation status, and 2) the maximum benefit to a zero-earning family (of appropriate size) and the increment to benefits that it receives if an additional birth occurs enter as explanatory variables. Policy variables are predicted to have little or no effect on the fertility behavior of 1978 nonparticipants.[14] If children are a "normal good," one would expect additional benefits to have a positive effect on births. Consequently, additional births should be more likely in states that offer a higher per child increment.

[12]Theory suggests that future marital status may be endogenous with births. This issue is ignored here.

[13]Acs (1993), working with a group of 14 to 23 year-olds in the National Longitudinal Survey of Youth--Young Women (NLSY), also finds that AFDC recipiency around the time of a first birth has little effect on the likelihood of a second birth, suggesting that this result may be robust even for teenage mothers.

[14]This crude assumption is relaxed below.

Table 4 presents the findings for a sample of 134 participants in 1978.[15] Age, race, mother's age at first birth, and education are insignificant. Ultimate marital status and the initial number of children continue to be significant, as are maximum benefits and the increment to new births. The split between the effects of base and incremental benefits may be capturing nonlinearities in the birth response, which would account for the negative coefficient on base benefits. The predictive power of the model (presented in the frequency table and summarized by a pseudo-R^2) is far superior to what is essentially the same model excluding the policy variables presented in table 3. The probit coefficients suggest that an additional $10 in base benefits is associated with a 1-percentage-point lower probability of subsequent births, while a $10 increase in the per child increment raises the probability of an additional birth by 6 percentage points. This suggests that New Jersey could reduce births to AFDC mothers by 25 percent if incremental benefits were cut an average of $41.78 ($64 in nominal 1994 dollars).

However, there is reason to believe that this estimate is overstated. Family size, the presence of children less than six years of age, and the AFDC guarantee have been shown to have a positive influence on welfare participation across many studies and data sets. Consequently, new births may be associated with higher incremental benefits, not because benefits cause new births, but because *both* the addition to the family and the higher (final) benefits in a state make AFDC participation more attractive for given levels of initial benefits and other factors. Even the extreme case of random births may generate a positive relationship between incremental benefits and births. All else equal, one would still expect women facing higher birth increments to be more likely program participants, simply because higher birth increments mean higher final family benefits, which have a demonstrated positive effect on participation.

[15]Similar specifications applied to the 1978 nonparticipating group yield insignificant coefficients on the policy variables.

The nested logit approach presented in the next section addresses these concerns in two ways. First, the participation decision is incorporated into the estimation subsequent to the birth decision, so that family size and children's age variables are included as explanatory variables in the participation stage. Second, the birth increment may affect the participation decision only after a birth has occurred, while having little impact on the birth decision itself. The sequential structure of the estimation leaves open the possibility that this indirect effect of the guarantee increment on births is minimal relative to other factors that both directly and indirectly affect births. Finally, the nested logit specification allows for the possibility that benefits to 1983 participants influence the birth decision even if they did not participate in 1978, and that benefits may influence the birth decisions of those who did not participate ex ante or ex post.

V. A Sequential Choice Model

Taking initial status as a single female with one or more children as given in 1978, I estimate the probability of an additional birth and, contingent upon whether the birth occurs, the probability of participating in the AFDC program in 1983. Since policymakers' primary interest is in program participants, it will be interesting to contrast estimates for initial participants and nonparticipants. If those who view welfare as a "way of life" are most responsive to program rules, substantial reductions in births and program costs could occur if additional benefits are denied to current (but not new) participants.

The model estimates can be used to examine the effect of the per child increment on both the decision to have an additional child and the decision to participate in AFDC contingent upon an additional birth. Thus, I can address the primary question that seems to be on lawmakers' minds: Do incremental benefits promote participant fertility? I can also assess the impact of the incremental benefit on total program participation (i.e., both continued and new).

Model

The nested logit model is governed by equations for the binary variables "have a child" and "participate in AFDC." Let "N" and "π" denote these choices. There are i = 1,2 choices for N (i.e., give or do not give birth to an additional child -- or children -- over the period 1978-83) and j = 1,2 choices for π (participate in 1983 or not). The sequential choices form the decision tree illustrated in figure 2. The indirect utility from the final outcome (i,j) of the decision process is specified as

$$U_{ij} = V_{ij} + \epsilon_{ij}$$
$$V_{ij} = \beta' X_{ij} + \alpha' Y_i,$$

where X_{ij} contains variables specific to the (birth-contingent) participation decision, and Y_i contains variables that determine childbirth but not subsequent decisions. The random utility model makes explicit the inability of agents to optimize perfectly, both because in a realistic setting their actions cannot yield precisely the theoretically possible utility value, and because changed circumstances may lead to changes in preferences in the future that are unpredictable a priori. However, the maintained assumption is that consumers' underlying behavior is constrained optimization of perceived expected utility. That is, the observed choice (i,j) corresponds to

$$\max\{U_{11}, U_{12}, U_{21}, U_{22}\}.$$

The parameter estimates are obtained by maximum likelihood using the joint extreme value distribution for the ε_{ij}, which yields a probability for outcome (i,j) of

$$P_{ij} = \frac{\exp(\beta' X_{ij} + \alpha' Y_i)}{\sum_{m=1}^{2} \sum_{k=1}^{2} \exp(\beta' X_{mk} + \alpha' Y_m)}$$

and a conditional probability for participation choice j given birth outcome i of

$$P_{j|i} = \frac{\exp(\beta' X_{ij})}{\sum_{k=1}^{2} \exp(\beta' X_{ik})} .$$

For derivations of these probability expressions, see Maddala (1983), section 3.6.

Variables

The binary choice variables are whether a birth occurs over the 1978-83 period and whether the agent is a 1983 AFDC participant. Figure 2 shows the sequence of decisions and the number of observations on each decision. Previous estimates suggest that biological variables have an important influence on fertility. State policy toward abortion and the availability and generosity of family planning or prenatal services have also been cited as important determinants (e.g., Moore and Caldwell [1977] and Lundberg and Plotnick [1990]). The mother's current age, her age at first birth, the current number of children, and the number of small children in the home are variables that reflect preferences about family structure and that indicate the mother's biological ability to bear additional children. State policies that affect births include the availability and cost to the mother of abortion and other family planning services, the availability and generosity of both Medicaid and private health insurance, and the generosity of the Women, Infants, and Children (WIC) program. WIC supplements food stamps and has been available to pregnant women in all states but Utah since 1976. Income and total net wealth in 1978 are included in the birth decision because they indicate resources potentially available for children's consumption (part of the effect of 1978 AFDC participation on births should be transmitted through extremely low resources). Finally, race, religion, prior marital status, and education reflect heterogeneity in childbearing behavior as well as awareness about contraception.

I follow the previous literature[16] in assuming that the primary observable determinant of welfare participation is the trade-off between income from welfare and income from the labor market: The important variables are the benefit guarantee in the state, the wage that the female head can obtain in the marketplace, and other income (such as alimony) that is heavily "taxed" by the AFDC program. The AFDC guarantee varies by family size and takes on different values according to which branch of the decision tree is chosen in the birth stage. While the hours worked choice is not explicitly modeled, the presence of preschool children, who pose the most significant child care problem, depends on the 1978-83 birth decision and is reflected in the relative importance of the number of children across the participation branches. Variables thought to be influential at both levels of choice are education and age (reflecting fertility and work experience), number of children, race, and Medicaid coverage. Variables thought to affect participation directly are child care policy, prior experience with welfare, and the local unemployment rate.

Estimated Wages

Wages are an important indicator of the trade-off between welfare and work. NLSW respondents were asked about wages in their current or previous job during the 1983 interview. However, about one-third did not report wages because they had never worked or because they did not respond to the question. In those instances where 1978 wages are reported but 1983 wages are not, inflated wages from the earlier year are used. For the remaining observations that do not report wages in either period, wage rates are imputed from a standard human-capital wage equation.

[16]For example, see Moffitt (1983) and Blank (1985).

Empirical Findings

Estimates of the effects of personal characteristics and policy variables on births and participation are obtained from the nested logit model. Mechanically, this amounts to estimating a discrete choice model for 1983 participation (with the coefficients of the conditional choices constrained to be equal), constructing an "inclusive value" from the fitted results, and estimating a discrete choice model for 1978-83 births with the inclusive value as an additional explanatory variable. Standard errors are corrected for the fact that the inclusive value is estimated.[17] All dollar figures are deflated using the Consumer Price Index.

The top panel of table 5 presents the coefficient estimates of the welfare participation problem given the birth choice. Only four of the 10 included variables are significant at the 5 percent level or more, but each has the anticipated effect on participation. Larger benefits and more children lead to a greater likelihood of participation, while higher wages make work more attractive and reduce the chances of participation. The local unemployment rate is significant at the 10 percent level and increases the value of participation by reducing the return to being in the labor market. Coefficients on age, non-labor income, education, race, and a constant are not significant in the discrete choice model for participation.

Future marital status is an important determinant of participation status, since married women are effectively removed from the prospective AFDC population. Ideally, one would like to incorporate marriage as an endogenous choice, but the sample is too small for this to be feasible. Instead, it enters as a highly significant explanatory variable in the participation model. To investigate the possible bias introduced in the coefficients by the inclusion of 1983 marital status, I reran the participation phase of the model without this variable (the results are not reported). The only coefficient that changed

[17]The multinomial logit model is obtained by restricting the coefficient on the inclusive value to one.

significantly was for race. Nonwhite female heads are much more likely participants than whites if future marital status is excluded, indicating that it is mostly whites exiting the eligible population through marriage. All of the second-stage estimation is based on the specification with marriage.

The second part of table 5 reports the findings of the birth choice estimation. Policy variables in the birth stage include the value of WIC benefits and family planning services, Medicaid expenditures, and an index of state abortion policy. Because women who are in the AFDC program may have more ready access to or may be more comfortable using other public programs, WIC benefits and family planning services are also interacted with 1978 AFDC participation, although WIC and family planning are not strictly governed by income and asset tests, as the larger programs are. One would expect higher WIC benefits to increase births, while the availability of family planning should increase the value of the "no birth" choice by subsidizing the effort and expense of contraception. State-averaged Medicaid benefits for one woman and one child are interacted with AFDC participation, since this is the primary method of access to Medicaid. Medicaid provides abortion services and covers pre- and postnatal care, so the overall effect on births is ambiguous.[18] However, I find that none of these policy variables has a significant influence on births.

In contrast to the findings of the simple birth probits in tables 3 and 4, the mother's age at first birth, initial number of children, and prior marital status are insignificant in the nested logit specification. Income and education are strongly significant, while they were not in the earlier single-equation specifications, suggesting that the nested logit model gives more credit to economic, rather than biological, circumstances at the time of the birth decision. In fact, total resource variables (1978 income and total net wealth) are the most influential of all, implying that current AFDC participants are less likely to have additional children because they are at the bottom of the income and wealth

[18] I attempt to separate these effects by interacting the Medicaid variable with both the restrictiveness and continuity variables for abortion policy. None of the interactions is significantly different from zero. The findings are not reported.

distributions.

Consistent with earlier findings, the mother's current age significantly reduces the probability of another birth. Nonwhites are more likely to give birth over the next five years. For 1978, AFDC participation was entered directly in some specifications of the birth choice (not reported), but as before, did not positively influence births. Finally, the inclusive value carried over from the participation stage significantly and positively affects the birth decision and is significantly different from one, supporting the nested over the multinomial logit specification. In combination with the findings from the first stage, this implies that increased AFDC benefits result in a significantly higher unconditional probability of a birth. I now proceed to investigate the magnitude of this effect.

Simulations

To be clear about the simulation exercise below, it is worth spelling out the role of AFDC benefits in the model explicitly. Letting U_{ij} denote the utility from the outcome of birth choice i and participation choice j, we have

$$\begin{aligned} U_{11} &= f[G(N_0+K), X_{11}, Y_1] + \epsilon_{11} \\ U_{12} &= f(E, X_{12}, Y_1) + \epsilon_{12} \\ U_{21} &= f[G(N_0), X_{21}, Y_2] + \epsilon_{21} \\ U_{22} &= f(E, X_{22}, Y_2) + \epsilon_{22}, \end{aligned}$$

where N_0 is the initial number of children, K is the change in the number of children between 1978 and 1983, G(N) is the AFDC guarantee for a family of one adult plus N children, E is autonomous income, and X_{ij} and Y_i are as defined above. Thus, the first term, for example, specifies utility from the decisions to have a child and participate in welfare as a function of the welfare guarantee for a family of size "N_0 + K" and the other choice-specific variables.

The specific policy changes in New Jersey and Wisconsin disallow incremental benefits for births occurring while the mother is on AFDC. Presumably, those entering the program still face guarantees that vary by family size. If $G(N_0)$ denotes the maximum benefit to a family of size N_0, this policy change can be simulated by setting $G(N_0+K) = G(N_0)$ for all K in the lower branches of the decision tree for current (1978) participants, but not for 1978 nonparticipants. From the new implied probabilities of participation, the number of 1978 participants changing their birth choice can be inferred.

The proposed policy change affects participation rates in two ways. First, the probability of participation conditional upon giving birth is reduced because welfare benefits are now lower, dropping 1.8 percentage points on average and 2.5 percentage points for previous participants (see table 6). Second, the probability of giving birth is indirectly reduced by the adverse policy change, falling 1.5 percentage points on average and 2.3 percentage points for previous participants. However, participation increases through another channel: While participation probabilities conditional upon no birth are unaffected by the new policy, unconditional birth probabilities must rise.[19] Therefore, the joint probability of observing participation without a birth rises above that of the base case, up 0.3 percentage point for the entire sample and 0.7 percentage point for the previously participating subgroup. The net effect of the policy change is that the 1983 participation rate drops by only a very small amount: 0.4 percentage point for the entire sample (from 21.9 percent to 21.5 percent) and 0.7 for the subsample of 1978 participants (from 34.7 percent to 34.0 percent).

The above estimates can be combined with benefit information to provide some idea of the total cost savings of denying incremental benefits to participants alone. Given actual 1983 participation data, the average monthly benefit cost is $322 per participant. For the subgroup who participate in both 1978 and 1983, comprising 71 percent of the 1983 participant group, the average cost is slightly higher ($340), accounting for 75 percent of total costs. If the policy change does

[19]Intuitively, many of those who are discouraged by the policy change from having a child will nevertheless participate in AFDC.

nothing to discourage births among this group, the average cost of a continuing participant would be reduced by $9.65 per month, or 2.8 percent.[20] For the group of 1978 participants, the total expected participation rate drops from 34.7 to 34.0 percent, implying at most a 3.5 percent (= 2.8 + 0.7) cost reduction for the previously participating group ($11.90 per person), or a 2.6 percent (= 0.75 x 3.5) reduction in total costs. Hence, although the empirical findings support a significant effect of policy on births, it does not seem possible to generate large cost savings from the proposed policy change, simply because the relative size of incremental benefits and the propensity of AFDC participants to give birth are both quite small.

VI. Conclusion

Summary of Findings

This paper finds support for the notion that birth decisions respond to welfare program incentives, but the magnitude of the response is modest. At least among mature (i.e., 24 to 34 year-olds in 1978) mothers, the potential cost savings of denying birth increments are small, both because relatively few welfare mothers give birth (at least in this sample) and because although benefits significantly and positively affect participation, birth increments are not of sufficient magnitude to discourage participation by much. In fact, denying incremental benefits to AFDC recipients who bear more children while on the program would save just $11.90 per month per continuing participant under the 1983 benefit schedule, or 2.62 percent of their average payment. If the maximum benefit were frozen for all female heads at the 1978 family size, total participation would be reduced by less than half of 1 percent. In the remainder of this section, I compare my findings with the related literature.

[20]This is less than the average per child increment because the cost savings are obtained only for those actually giving birth, and very few 1978 participants give birth by 1983.

Related Literature

Acs (1993), using a sample of women between the ages of 14 and 16 in 1979 from the NLSY, concludes that there is little support for the hypothesis that incremental benefits encourage births among female heads of household. Acs examines first and second births occurring by age 23 using the single-equation hazard approach of Plotnick (1990). The welfare participation decision is not explicitly modeled, and the particular empirical specifications are similar to the model reported in table 4.[21] Acs' policy variables are the maximum benefit for a family of two and the "AFDC gap" between family sizes of two and three. His findings on the effect of policy variables are overall quite similar to mine, but he dismisses significant results for some groups as an artifact of the omission of the separate influence of children on participation. This paper goes further to demonstrate that benefit policy has an independent and significant effect on births, but that findings from the single-equation approach are grossly overstated due to a type of simultaneous-equations bias.

In contrast with the results of Lundberg and Plotnick (1990), I find little evidence that policies such as WIC benefits, family planning, and state abortion laws influence fertility. However, Lundberg and Plotnick's data set (the NLSY) allows them to implement a more specific test: They have sufficient data to model conception and birth decisions separately. It is possible that realized births are not sufficiently informative to test the effects of these policies. Lundberg and Plotnick (1990) also examine younger women, who presumably have more to learn about family planning. It may be that the mature women in the NLSW sample have little knowledge to gain from state-sponsored programs, and hence these programs are of little relevance for their birth decisions.

In recent work, Murray (1994) revisits the basic time series evidence on welfare policy and illegitimate births. He suggests that while the number of births per (black) woman has been falling

[21]Technically, the primary difference is that Acs estimates a logit specification with corrections for censored observations.

over the last 20 years, commensurate with the population as a whole, the share of illegitimate births in all births has been following increases in welfare generosity with a two-year lag. The results of my analysis are typical of the type that frustrate Murray about cross-sectional studies: Policy effects are found to be significant but minuscule. While the finding that single welfare mothers are no more likely to bear additional children than their nonparticipating counterparts seems to support earlier evidence that the illegitimacy rate has not been driven by welfare policy, plausible competing hypotheses are that the sample is from a period when the "culture of poverty" had seeped into the non-welfare-participating groups, or that female-headed households are culturally quite similar, regardless of whether they participate in welfare.

Appendix A: Policy Variables

Policy variables are culled from various sources, including Bush (1983), Gold (1982), Sollom (1994), Torres, Forrest, and Eisman (1981), Torres and Forrest (1983), and several government agencies.

ABLAW: An overall score of the restrictiveness of state law with regard to abortions. A point is added if 1) abortions became legal only after 1969, 2) parental consent or notification is required, or 3) second-trimester abortions must be performed in a hospital. A higher score reflects a more restrictive policy, which may discourage women from seeking abortion services.

HYDE80: The Hyde amendment, passed in 1977, virtually eliminated the federal role in providing subsidized abortion services for women on Medicaid. During 1980, the amendment was temporarily suspended by court order. The dummy variable HYDE80 is zero if states continued to provide funding for Medicaid abortions when the amendment was in force during 1980-81. This variable should capture both the acceptability of abortion in the state (i.e., a willingness to continue to provide the same level of service offered by the federal government before 1977) and any strong discontinuities in abortion funding over the periods before, during, and after the amendment's suspension.

FP79: Title IX provides federal funds for family planning. While low-income women are its primary target, anyone can receive services. The expected value of family planning services is defined as the percentage of "at-risk" low-income women served by family planning services in a state times an estimate of per patient expenditure. An at-risk woman is sexually active. Total expenditures are divided by the sum of at-risk low-income women plus teens served. The denominator excludes higher-income women served, which may lead to a slight overstatement of per patient expenditure. (Note that since funds come from federal sources, state-level variation arises from different probabilities of participation, which may in part reflect the state's ability to distribute aid efficiently.)

WIC78: The Women, Infants, and Children's program provides food to pregnant and nursing mothers. Monthly data on participation and food expenditures by state are averaged over the year. Average monthly food expenditures are divided by the average monthly number of participants to arrive at a per-recipient food expenditure amount. Data are from the U.S. Department of Agriculture (1979).

MEDIC78 and MEDIC83: Variables on statewide Medicaid expenditures per AFDC adult and child are from the Joint Tax Committee "Green Book" (various editions). These are combined to yield expected values of Medicaid for AFDC families of various sizes.

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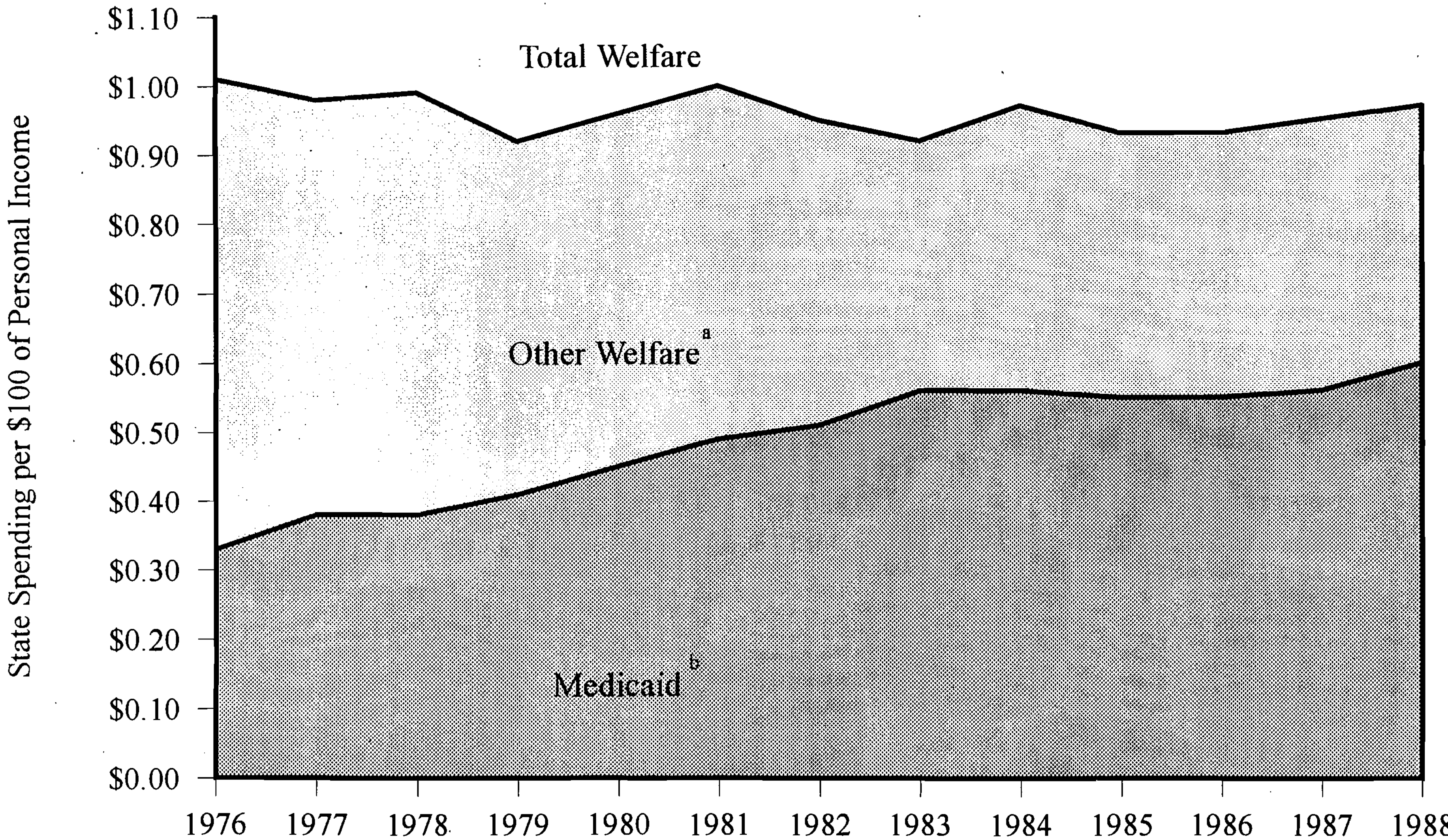
Figure 1: Welfare Expenditures, 1976-1989

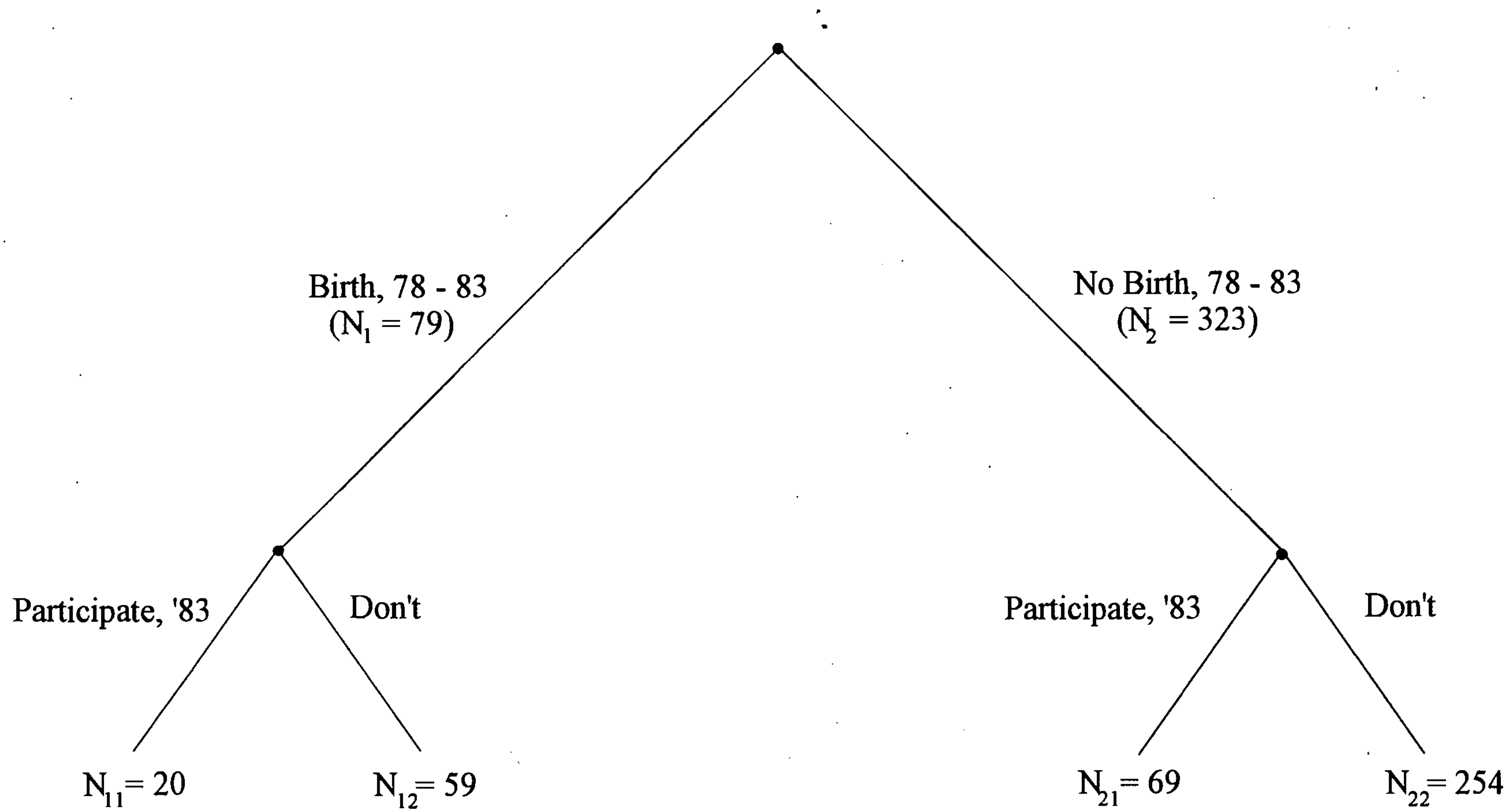


a. Includes cash assistance payments and other support of and assistance to needy persons, contingent upon their need.

b. Includes not only direct spending on state-operated programs, but also payments to local governments when they have partial responsibility for funding Medicaid. Locally funded expenditures are not included.

Source: National Conference of State Legislatures.

Figure 2: Discrete Decision Tree



Source: Author's computations from the NLSW.

Table 1: Characteristics of Female-Headed Households by AFDC Participation Status, 1978

	Participant[a]	Nonparticipant[b]	t-statistic[c]
Number of children	2.62	1.95	6.74 *
Fraction with one child	0.24	0.44	5.08 *
Fraction with two children	0.30	0.32	0.52
Fraction with three children	0.24	0.13	3.57 *
Fraction with four+ children	0.23	0.11	4.15 *
Mother's age	28.46	28.74 (N=435)	1.14
Mother's age at first birth	18.07 (N=216)	19.22	5.16 *
Fraction with children under six	0.41	0.39	0.52
Age of youngest child	7.16	7.39 (N=441)	1.08
Spread between oldest and youngest child (years)	3.21 (N=216)	2.16 (N=435)	4.53 *
Spread/2 children	2.23 (N=65)	2.53 (N=137)	1.20
Spread/3 children	3.96 (N=52)	4.88 (N=58)	2.68 *
Spread/4 children	5.81 (N=16)	6.10 (N=31)	0.43
Spread/5 or more children	7.81 (N=32)	7.73 (N=15)	0.12
Percent of mothers who are white	0.27	0.44	4.25 *
Fraction never married	0.34	0.25	2.34 *
Fraction marrying, 1978-83	0.17	0.25	2.06 *
AFDC participant, 1983	0.40	0.09	9.94 *
Maximum benefit, two children	267.62	238.78	2.53 *

a N=217 except where otherwise noted.

b N=442 except where otherwise noted.

c t-test for equality of means of samples are drawn from two populations with the same variance, $t_{.025,\infty} = 1.96$.

* Exceeds t for difference at 5 percent confidence level.

Source: Author's computations from the NLSW.

Table 2: Future Fertility of Female-Headed Households by AFDC Participation Status, 1978

	Participant[a]	Nonparticipant[b]	t-statistic[c]
Fraction bearing children, 1978-83	0.15	0.18	0.96
Fraction bearing out-of-wedlock children, 1978-83	0.09	0.11	0.82
Number of future births | birth occurs	1.34 (N=32)	1.17 (N=81)	1.73
(Fraction | 1 child, 1978)	0.14 (N=51)	0.20 (N=196)	1.08
(Fraction | 2 children, 1978)	0.15 (N=65)	0.15 (N=140)	0.07
(Fraction | 3 children, 1978)	0.23 (N=52)	0.24 (N=59)	0.08
(Fraction | 4+ children, 1978)	0.06 (N=49)	0.13 (N=47)	1.11
(Fraction | 1 child, age 24-29, 1978)	0.16 (N=37)	0.26 (N=133)	1.18
(Fraction | 2 children, age 24-29, 1978)	0.18 (N=49)	0.18 (N=83)	0.04
(Fraction | 3 children, age 24-29, 1978)	0.25 (N=32)	0.32 (N=31)	0.63
(Fraction | 4+ children, age 24-29, 1978)	0.13 (N=16)	0.29 (N=17)	1.18

[a] N=217 except where otherwise noted.

[b] N=442 except where otherwise noted.

[c] Ibid table 1.

Source: Author's computations from the NLSW.

Table 3: Probit Estimates of Births Using AFDC Participation as an Explanatory Variable[a]

Variable	Coefficient	Probability Change	Mean (x)	Std. Dev. (x)
Age	-0.108 (3.16)[b]	-2.31E-02	18.653	3.037
White[c]	-0.42 (2.87)	-9.03E-02	0.388	0.488
Children l.t. 6[c]	0.207 (1.18)	4.44E-02	0.402	0.491
Married by 1983[c]	0.66 (4.52)	0.142	0.219	0.414
Mother's age at first birth	8.25E-02 (2.13)	1.77E-02	18.823	2.737
1978 income	-1.84E-05 (1.26)	-3.98E-06	7345.2	5204
Education:				
Not high school graduate[c]	-0.132 (.24)	-2.83E-02	0.364	0.481
High school graduate[c]	8.39E-03 (.014)	1.81E-03	0.636	0.481
Children:				
One child, 1978[c]	-0.531 (2.35)	-0.114	0.38	0.486
Two children, 1978[c]	-0.597 (2.99)	-0.128	0.308	0.462
Four children, 1978[c]	-0.499 (1.94)	-0.107	0.145	0.353
AFDC participant, 1978[c]	-0.259 (1.76)	-5.56E-02	0.338	0.473

Pseudo-R^2 = 42%

[a] Sample of 640 women who are heads of household in 1978.
[b] $t_{.025,\infty} = 1.96$, $t_{.05,\infty} = 1.645$.
[c] Binary variable equal to one if statement is true for household.
Source: Author's computations from the NLSW.

Table 4: Probit Estimates of Births Using AFDC Benefits as an Explanatory Variable[a]

Variable	Coefficient	Probability Change	Mean (x)	Std. Dev. (x)
Age	-0.105 (1.49)[b]	-3.03E-02	28.28	3.18
White[c]	-0.516 (1.18)	-8.39E-02	0.269	0.445
Children l.t. 6[c]	3.15E-01 (.846)	5.12E-02	0.448	0.499
Married by 1983[c]	0.896 (2.40)	1.46E-01	0.164	0.372
Mother's age at first birth	8.81E-02 (.982)	1.43E-02	17.97	2.352
1978 income	-2.43E-05 (.52)	-3.96E-06	6156.3	5847.5
Education:				
Not high school graduate[c]	0.767 (.410)	1.25E-01	0.478	0.501
High school graduate[c]	1.12 (.57)	1.82E-01	0.522	0.501
Children:				
One child, 1978[c]	-1.38 (2.26)	-0.225	0.224	0.418
Two children, 1978[c]	-1.175 (2.59)	-0.191	0.284	0.452
Four children, 1978[c]	-4.377 (.11)	-0.712	0.0597	0.238
AFDC benefit, 1978	-6.40E-03 (2.71)	-1.04E-03	333.74	138.3
Incremental benefit, 1978	3.74E-02 (2.57)	6.09E-03	56.71	22.08

Pseudo-R^2 = 70.3%

[a] Sample of 134 state-matched, AFDC-participating female household heads in 1978.
[b] $t_{.025,\infty} = 1.96$, $t_{.05,\infty} = 1.645$.
[c] Binary variable equal to one if statement is true for household.
Source: Author's computations from the NLSW.

Table 5: Nested Logit Estimates

	Coefficient
Participation	
Constant [a]	-0.655 (0.54)
Age [a]	0.025 (0.55)
AFDC benefit [a]	0.002 (1.97)
Future marriage [b]	-1.92 (3.49)
Nonwage income [b]	9.68E-06 (0.43)
Education (years) [b]	-0.027 (0.44)
Unemployment [b]	-0.069 (1.61)
White [b]	0.271 (0.74)
Wage[b]	0.643 (6.0)
Number of children [a]	0.285 (2.26)

(continued)

Table 5: Continued

Births	
Constant [c]	0.018 (0.01)
Prenatal*participation [c,d,e]	-0.039 (1.21)
Prenatal [c,d]	0.007 (0.339)
Age [c]	-0.188 (2.52)
Education (years)[d]	-0.161 (2.20)
Income [c]	9.29E-05 (3.40)
Net wealth [c]	2.50E-05 (2.62)
Age @ first birth [c]	0.053 (0.63)
Number of children [d]	-0.09 (0.74)
Number of preschool children [c]	0.209 (0.74)
Never married [d]	0.16 (0.62)
Medicaid*participant [d]	0.001 (0.55)
White [d]	0.731 (2.03)
Abortion law index [d]	0.268 (1.32)
Inclusive value [c,d]	3.34 (2.27)

a Variable affects participation.
b Variable affects nonparticipation.
c Variable affects birth.
d Variable affects no birth.
e Family planning and WIC are combined into a single variable.
Source: Author's computations from the NLSW.

Table 6: Policy Simulations

	Sample					Subsample of 1978 AFDC Participants				
Status Quo										
P(B[a],P[b])	=	P(P | B)	*	P(B)		P(B,P)	=	P(P | B)	*	P(B)
0.052	=	0.264	*	0.197		0.082	=	0.41	*	0.201
P(NB[c],P)	=	P(P | NB)	*	P(NB)		P(NB,P)	=	P(P | NB)	*	P(NB)
0.167	=	0.208	*	0.803		0.265	=	0.332	*	0.799
New Policy: No Incremental Benefits for New Births										
P(B,P)	=	P(P | B)	*	P(B)		P(B,P)	=	P(P | B)	*	P(B)
0.045	=	0.246	*	0.181		0.068	=	0.385	*	0.178
P(NB,P)	=	P(P | NB)	*	P(NB)		P(NB,P)	=	P(P | NB)	*	P(NB)
0.170	=	0.208	*	0.819		0.272	=	0.332	*	0.822

a B=birth.
b P=participant.
c NB=no birth.
Source: Author's computations from the NLSW.