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Marital Status and Fertility in the United States: Welfare and Labor Market Effects

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CENTER DISCUSSION PAPER NO. 703

**MARITAL STATUS AND FERTILITY IN THE UNITED STATES:
WELFARE AND LABOR MARKET EFFECTS**

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ABSTRACT

The incidence of marriage and the proportion of childbearing that occurs within marriage has decreased sharply in the United States in the last several decades. This paper examines whether the probability that a woman is currently married and the number of children she has born, as reported in the 1980 U.S. Census, is related to two identifiable factors: the variation in welfare programs across states (specifically, AFDC and Medicaid benefits and AFDC-UP expenditures) or in market wage opportunities available to women and to their potential husbands. AFDC and Medicaid benefit levels are associated with fewer women being currently married. Medicaid benefits are related to lower fertility levels for both black and white women, whereas AFDC benefits in cash and food are associated with lower fertility among white women age 15 -24. Those states that extend AFDC benefits to families with Unemployed Parents (i.e. fathers in intact poor families) do not have significantly more women married or higher fertility rates, as might be expected from economic incentives. Men's market wages are associated with more frequent marriage and higher fertility, whereas higher market wage opportunities for women have substantial effects in the opposite direction, all of which are consistent with standard models of gender specialization and the demand for marriage and fertility.

KEY WORDS: Marriage, Fertility, Welfare System, United States

I. INTRODUCTION

In the United States, employment rates for mothers are at all time highs. Since 1973, fertility rates have hovered close to their historic lows, with about 1.7 births per white woman and 2.4 births per black woman (U.S. Bureau of the Census, 1982, 1991). Between 1965 and 1985 the number of families supported by the Aid to Families with Dependent Children (AFDC) program increased by 270 percent (Moffitt, 1992). Yet despite more mothers working, fewer children, and higher child welfare expenditures, poverty in the United States has increasingly become a problem among children. This appears to be a distinctive feature of the United States among high income countries (Smeeding and Torrey, 1988). Some worry that this child poverty problem is, in part, an unintended consequence of welfare increasing fertility, reducing marriage and reducing the incentive to work (Blank, 1985, 1989; Danziger et al., 1982; Ellwood and Bane, 1985; Ellwood and Crane, 1990; Levy, 1988; and Murray, 1984).

Whatever the reasons, there have been substantial changes in family structure in the United States. The median age at marriage has been increasing, and a growing proportion of women are not marrying, particularly among blacks (Bennett et al., 1989). The fraction of births out of wedlock had increased to 56 percent for blacks by 1979 and to 18 percent for whites (U.S. Bureau of the Census, 1982, 1991). From 1970 to 1990, the fraction of white families with children that contain only a single parent doubled from 10 to 23 percent, while the fraction of single parent black families rose from 36 to 61 percent (U.S. Bureau of Census, 1991).

In this study, an attempt is made to measure the impacts of welfare on marital status and fertility, controlling for the wage opportunities facing different types of women and their potential spouses. In studies that do not

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control for wage opportunities, welfare variables may serve as proxies for poor labor market conditions or poor marriage prospects (from an economic perspective).

The interrelationships are explored between different types of income support and aspects of family behavior that have important effects on the economic well-being of children:

- (1) The probability of work and the expected hourly wage rates for a woman and her potential spouse (whether or not a woman actually has a spouse).
- (2) The likelihood of a woman living with a spouse, controlling for the expected hourly wage rates for the woman and for her potential spouse.
- (3) The expected number of children ever born, controlling implicitly for the probability of having wage work and explicitly for the expected hourly wage rates for the woman and for her potential spouse.

The empirical analysis is primarily based on micro data from the 1980 U.S. Census. It involves several stages.

For each race group (black, and nonblack hereafter referred to as "white"), a probit equation for the probability that a woman is a wage earner is jointly estimated together with an equation for the woman's expected log wage conditional on her being a wage earner. Also, a probit equation for the probability that the potential spouse is a wage earner is jointly estimated together with an equation for the spouse's expected log wage conditional on his being a wage earner. In the spouse equations, only the characteristics of the sampled women are used as explanatory variables to avoid including match-specific variables that are jointly determined aspects of the marital unions (Cf. Welch, 1974). One Marriage.#4

advantage of the joint estimation of the equations for the probability of being a wage earner and the corresponding log wage equations is that the resulting estimated wage equations are corrected for selection into the samples of women and of spouses with observed wage rates (Heckman, 1987). The estimated wage equations are used to impute wage rates for all women including nonwage earners, and for all potential (i.e. predicted) spouses including the predicted spouses of currently unmarried women and currently married women.

The predicted wage variables are included as explanatory variables in probit equations for the probability that a woman is currently married and enumerated with her spouse present (Section V), and in ordinary least squares equations for the number of children ever born (Section VI). Separate estimation results are presented for black and for white women in the age groups of 15-24, 25-34 and 35-44.

The contribution of this paper is to control for the effects of male and female wage opportunities, in order to assess without bias the effects of several forms of welfare support--AFDC cash and food, Medicaid, and unemployed parent (UP) benefits--on marriage and fertility. If one suspects that the matching of wife's and husband's characteristics, their marital status, and fertility are all intimately related social processes, it is not easy to identify one statistically from another. To avoid simultaneous equation bias, this paper relies only on the woman's characteristics to predict both her wage opportunities and those of her potential mate. For the same reason, fertility can be consistently estimated only for the combined sample of married and unmarried women, because correction for sample selection of the marital status specific samples are not identified and thus there is little justification, according to this view, for the practice in the literature of estimating fertility equations for the married, single, or female headed households, separately.

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Empirical implementation is based on the 1980 Census public use sample merged with state information on welfare and unemployment programs and price level deflators. Not only has the 1980 Census been neglected for such analytical purposes, it provides unusual information on individual ownership of wealth income, which facilitates identification of the wage earner probit equations that are used to correct wage functions for sample selection bias.

Cross sectional regressions of this form rely upon the assumption that individuals tend to reach their equilibrium fertility and marital status consistent with their economic endowments, state level employment opportunities, and welfare programs. Although panel data from NLSY or SIPP might be more useful for evaluating short run dynamics, long term behavioral tendencies may be portrayed adequately from the relatively stable cross sectional patterns.

II. THE U.S. WELFARE PROGRAMS

The most important components of the U.S. transfer system for the poor are the AFDC program, the food stamp program, and the Medicaid program. There are interrelationships among the programs that are of special relevance in considering possible effects of welfare on family structure and labor supply.

1. The AFDC Program

The AFDC program dates back to 1935. It is almost exclusively a cash transfer program for lone mothers. Benefits are determined by family-size-specific "guarantee" levels and a progressive schedule for the reduction of the guarantee amounts with increases in family income. The reduction schedule is federally determined, but the income and asset eligibility requirements and the guarantee levels are set in each of the 51 states and the jurisdictions of the United States.

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As Moffitt (1992) documents, the number of families receiving benefits under AFDC grew gradually from its inception to the mid 1960s, very rapidly over the 1965-1975 decade, and slowly since then. The growth in the AFDC caseload is determined by the population of those eligible for support and the participation rate for those eligible. The eligible population has changed with changes in the number of lone mothers and with state-specific changes in income and asset eligibility requirements.

The participation rate is believed to be affected by the break even levels for the program for different types of families, with the break even level for a family being determined by its AFDC guarantee level and by the benefit reduction rate. The changes in the benefit reduction rate have been more dramatic than the state-specific changes in guarantee levels. The benefit reduction rate was 100 percent until 1967. Congress lowered it to 67 percent in 1967, with this change being implemented over the 1967-1969 period. In 1981, Congress again increased the benefit reduction rate to 100 percent.

There have been some changes in the participation rate for those eligible for support, perhaps due in part to changes in the guarantee levels and the benefit reduction rate. However, Moffitt (1992) concludes that the increase in the number of AFDC recipients since 1970 is overwhelmingly due to the increase in the number of lone mothers. The issue considered here is whether that increase in lone mothers was partly a response to AFDC benefit levels, or in other words, the unintended effect of the program was to increase the number of persons eligible for the program.

2. The Food Stamp Program

Begun in the mid-1960s, the food stamp program offers food coupons to families with low income and assets regardless of family type. The program

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benefits and eligibility requirements are federally determined. The program remained small until 1973 when Congress mandated that all counties in all states must provide the program. By 1985 there were twice as many food stamp recipients as AFDC recipients, though the program expenditures were only 50 percent greater than for AFDC because the benefits are lower (Moffitt, 1992).

There is a substantial overlap between the recipients of the food stamp and AFDC payments. As Moffitt (1992, Table 2) reports, in 1984, 30.5 percent of nonelderly single-parent families received food stamps and 86.2 percent of these also received AFDC benefits. In contrast, in 1984 only 3.6 percent of all nonelderly two-parent families received only food stamps. There are also important administrative links between the food stamp and the AFDC programs including eligibility requirements and joint taxation provisions. Single parent families tend to be disproportionately poor, and most are lone mothers, many of whom are eligible for food stamps.

3. The Medicaid Program

The Medicaid program, introduced in 1965, provides health benefits to low income families. The beneficiaries of this program have grown to exceed even that of the food stamp program. However, elderly, disabled and blind persons without dependent children constitute about 31 percent of those benefiting from Medicaid. Medicaid is federally subsidized and regulated. States have some leeway in defining eligibility, covered services, and the remuneration for covered services.

There has been an expansion of coverage for children in poor two-parent families, but poor husband-wife couples are generally not eligible for Medicaid. For female-headed families, 37 states have extended eligibility for Medicaid to those not receiving AFDC benefits. However, coverage for non AFDC female-headed Marriage.#4

families is generally only for major medical expenses, and then only after private assets have been used up. Thus, having full Medicaid coverage for a family largely depends on the absence of a husband and on having AFDC coverage.

4. The AFDC-UP Program

In approximately half the states in 1980, two-parent families meeting the income and asset conditions for AFDC and with children under 18 are eligible for AFDC-UP (UP for unemployed parent) benefits. The primary earner in the family (usually the husband) must have a history of labor force attachment and earnings similar to what would be required for eligibility for unemployment insurance, and must be currently unemployed. In 1979, only 8 percent of AFDC benefits were paid to AFDC-UP families. Despite recent growth in this program, the proportion of AFDC beneficiaries enrolled under the AFDC-UP program was only 7 percent in 1985. Federal legislation now mandates the availability of AFDC-UP programs in all states, possibly because it is viewed as mitigating the anti-marriage bias implicit in the eligibility rules for the traditional AFDC program.

III. CHARACTERIZING THE GENEROSITY OF WELFARE PROGRAMS

In order to test for and estimate the influence of welfare programs on marital status and fertility behavior, variables must be specified to measure the generosity of the AFDC and foodstamp, Medicaid, and AFDC-UP programs. The AFDC and food stamp programs are treated here together because of the tax linkage between the programs (the food stamp program taxes AFDC benefits at a 30 percent rate). The combined real cash equivalent of the state-specific maximum 1979 monthly AFDC benefits and the federally allotted food stamps for a mother with one child is the first program variable. Hereafter, this will be called the AFDC benefits. The correlations across states between the AFDC benefits for different

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sized families are very high, on the order of .95. Because of this, the state benefit level for one family size (here for a woman with one child) should adequately describe the entire state schedule for mothers with additional children.

As measured by the AFDC benefits, there is substantial variation across states in the generosity of the AFDC and food stamp programs. The variable representing the generosity of the Medicaid program is each state's Medicaid vendor monthly reimbursements to children and adults in AFDC families, which is divided by the total number of AFDC families on the welfare rolls in that month, whether or not they received Medicaid benefits. As can be seen from Table 1, in 1979 the average monthly Medicaid reimbursements to medical care providers per AFDC family were about half the average value for the AFDC benefits (\$117 per month versus \$252).

From the perspective of this study, it is important to note that the Medicaid program provides family planning information and services that could help reduce unwanted births.¹ In many states, Medicaid also subsidizes prenatal care and delivery costs for AFDC mothers, but typically not those costs related to their first birth (Howell and Ellwood, 1991). These subsidies would lower the costs of having additional children. It is not known whether, on balance, the Medicaid program has pro- or anti-natal effect. Empirical evidence would be instructive.

¹Medicaid payments specifically for family planning services represent only .53 percent of total Medicaid vendor payments, but other billing categories may include subsidies for family planning, such as drugs (i.e. pill prescriptions), or clinic fees, or even hospital care (i.e. for sterilization operations). Also, only about one-half of the total Medicaid vendor payments are paid to categorically needy (AFDC) dependent children under 21 and adults in families with dependent children. Source: Medicaid Tabulations Tables 9 and 10 provided by Robert Moffitt.

Expenditures by state on the unemployed parent (AFDC-UP) welfare program are also expressed in monthly terms and divided by the total number of AFDC families in that month. These expenditures are only about \$7 a month, but for the relatively few families enrolled under this program the average payment is larger than my AFDC cash and food stamp benefit level, because the AFDC-UP families tend to have more children.

One might imagine that to explain the current marital and completed fertility of a woman who is, say, 40 years old, it is not the welfare system in the state of current residence that is relevant, but information about the welfare system in her state of residence 10 or 20 years earlier that may have influenced her relevant decisions. Two sources of error are thus introduced by the standard practice of using current policy measures instead of lagged ones: the state of current residence may have changed its welfare generosity relative to other states over this 10 to 20 years, and the woman may have migrated from another state in this period.

Fortunately, the annual ranking of states by AFDC benefits has been relatively stable over time. This is illustrated by the simple correlation of AFDC benefits across states from one year to another year. For example, from 1972 to 1979 and again from 1979 to 1986 the correlation of AFDC benefits across states is .9.² Medicaid programs have rapidly expanded, and lagged values of Medicaid are not readily defined across states before 1975, while Unemployed Parent AFDC programs are also a relatively recent phenomenon limiting comparisons across states in earlier years. Census data do not contain interstate migration

²Alternatively, the Spearman rank correlation is also .90 between the AFDC benefit level across states in 1972 to 1979, and .94 between 1979 and 1986. The spread across states, summarized by the coefficient of variation, has also been quite stable at .39 in 1972, .38 in 1979, and .39 in 1986. The range between the minimum and maximum state narrowed slightly in relative terms from \$60 to \$216 in 1979 to \$88 to \$280 in 1986.

histories to mitigate the second source of potential error. In conclusion, the errors due to not lagging welfare program variables is probably not serious in the case of the AFDC cash and food benefits, but may be more serious for older women in the case of Medicaid and AFDC-UP benefits.

From Table 1 it can be seen that the state-specific measures for the generosity of the welfare programs are significantly correlated for the AFDC and Medicaid programs, and for the AFDC-UP and Medicaid programs, but are particularly strongly correlated for the AFDC and AFDC-UP programs. There is less relationship between the welfare benefit variables and the maximum number of weeks for which unemployment benefits can be collected in each state. Unemployment benefits are the main form of income support available to poor two-parent families with a history of employment. The moderately high intercorrelations across states between these four indicators of generosity in the state welfare systems suggest that it may be difficult to estimate the separate effect of all program indicators simultaneously on marital status and fertility.

IV. A CONCEPTUAL FRAMEWORK

The decisions determining current marital status and current fertility could be affected by a woman's anticipated economic opportunities, both within and outside of a marital union. Current predicted economic opportunities within and outside of marriage will be used as a proxy for the anticipated opportunities at the time when the decisions determining each woman's current marital status and fertility were actually made. For expositional simplicity, in the following discussion, welfare benefits are treated as potentially available only outside of marriage. Also, women will be regarded as being able to count on income from a spouse only when currently married. In other words, the likelihood that

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TABLE 1

MEANS AND INTERCORRELATIONS OF STATE LEVEL INCOME SUPPORT VARIABLES^a

Variable definition	Mean (Standard deviation)	Correlations			
		AFDC (1)	Medicaid (2)	AFDC-UP (3)	Unemployment duration (4)
1. AFDC maximum monthly benefit for mother and one child ^b	252. (78.9)	-			
2. Medicaid expenditures per month per family ^b	117. (36.6)	.439	-		
3. AFDC-UP expenditures per month per family ^b	7.04 (9.71)	.649	.354	-	
4. Maximum potential duration, in weeks, of unemployment benefits	23.8 (2.46)	.256	.107	.398	-

^a Unweighted observations for 50 states and Washington, D.C.

^b The welfare variables are adjusted for cross sectional differences in the cost of living using the BLS price index for the intermediate income level "basket" of consumer goods in U.S. SMSAs and nonmetropolitan areas. Thus the figures used should approximate the real purchasing power of the welfare benefits. Of course, families are not free to use medicaid benefits for alternative purposes. See the text for other details of the AFDC, medicaid and AFDC-UP programs.

divorced women would receive child support and alimony payments and that currently married women would receive welfare benefits such as food stamps or AFDC-UP are disregarded in this conceptual section for simplicity, but are consistent with the empirical portion of this study.

1. Earnings Opportunities

Both the expected hourly wage rate a woman would receive if she worked (W_f) and the expected wage rate for her potential male partner (W_m) are modeled as functions of a vector of characteristics of the woman (Y_f). Using only the woman's characteristics as explanatory variables for W_f and W_m avoids the possibility of including partner characteristics that are jointly determined together with the woman's marital status. Thus the wage equation for the woman can be represented as

$$(1) \quad W_f = W_f(Y_f; v_f),$$

and the wage equation for the woman's potential spouse is

$$(2) \quad W_m = W_m(Y_f; v_m),$$

where v_f and v_m are error terms.

The estimated wage equations are used to calculate predicted values for the wage offers that would be received by each woman if she worked (\hat{W}_f), and by the potential spouse if he worked (\hat{W}_m). It is assumed that the predicted wage variables are not correlated with the error terms for the marriage and fertility equations. It would be expected that the original wage variables are determined, in part, by omitted factors that also affect marriage and child bearing decisions.

2. The Probability of Marriage

The probability of a woman being currently married (M_f) is assumed to be a function of the predicted wage rate the woman could expect if she were employed (\hat{W}_f); the predicted wage rate of her potential male partner (\hat{W}_m); a vector of welfare benefits that would be available to her if she were not married (B_f); and a vector of other variables that affect the expected resources available to the woman regardless of whether she is married or unmarried (X_f), such as her own personal wealth. The error term is denoted by u_1 .

Thus, the probability of marriage is represented as

$$(3) \quad M_f = M_f(\hat{W}_f, \hat{W}_m, X_f, B_f; u_1).$$

Empirical evidence and some theories suggest that $dM_f/d\hat{W}_f < 0$, $dM_f/d\hat{W}_m > 0$, and $dM_f/dB_f < 0$ (Becker, 1974, 1981; Bishop, 1980; Nerlove and Schultz, 1970; Schultz, 1981; Wilson, 1987). The working assumptions for the maximum likelihood probit estimation are that the error is normally distributed and orthogonal to the observed covariates, and that it is independently and identically distributed. The marriage probability function (3) are estimated for men as well as for women, but only estimates for women are discussed in this paper. Those for all men are reported for comparison in Appendix Table A-2, based on estimated wage functions in Table A-1.

3. Fertility Equations

For both married and unmarried women, it is assumed that an increase in a woman's wage raises the shadow costs of children and increases her potential income constraint, with the hypothesized (but not theoretically necessary) consequence of reducing her demand for births. Virtually all economic studies of fertility find that either the female wage or female education is negatively correlated with fertility. Increases in the expected wage for a potential Marriage. #4

husband are hypothesized to exert a less negative effect on a woman's fertility than increases in her own wage (Mincer, 1963, 1985). Indeed, under plausible assumptions increases in the expected male wage should have a positive effect on fertility, and there is considerable supporting empirical evidence for this pattern (Schultz, 1981, 1986).

Therefore, for married women the fertility function is specified as

$$(4) \quad F^m = F^m (\hat{W}_f, \hat{W}_m, X_f; u_2),$$

where u_2 is an error term. It is hypothesized that $Df^m/d\hat{W}_f < 0$ and $Df^m/d\hat{W}_m > 0$.

For unmarried (single) women the fertility equation is

$$(5) \quad F^s = F^s (\hat{W}_f, \hat{W}_m, X_f, B_f; u_3),$$

where u_3 is an error term and where the vector of welfare variables (B_f) is introduced. It is expected that $dF^s/d\hat{W}_f < dF^m/d\hat{W}_f < 0$, $dF^m/d\hat{W}_m > dF^s/d\hat{W}_m > 0$, and $dF^s/dB_f > 0$ (Becker, 1981; Leibowitz et al., 1986; Lundberg and Plotnick, 1990; Rosenzweig and Schultz, 1985; T.P. Schultz, 1981, 1986, 1990; T.W. Schultz, 1974; Whittington and Peters, 1990).

Since marital status can be changed, an equation is needed for a woman's expected fertility, (F^t), without conditioning on her marital status. Unconditional fertility is the sum of the marital status specific fertility variables weighted by the respective probabilities of being currently married or unmarried; that is,

$$(6) \quad F^t = M_f F^m + (1 - M_f) F^s.$$

If equation (4) and (5) were estimated to assess directly the factors affecting fertility of married and unmarried women separately, sample selection bias could be expected, because the error, U_1 , in the marriage selection equation (3) is likely to be related to errors, U_2 and U_3 , in the marital status specific fertility equations because they would capture the effects of common omitted variables. Since I see no conceptual basis for identifying the required sample

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selection correction procedure (Heckman, 1987), I estimate fertility determinants without bias based on equation (6) for the combined married and unmarried sample. Fortunately, some of the signs of the derivatives of the unconditional fertility function (6) are implied by the conditions already hypothesized for equations (3), (4) and (5).

Ignoring nonwage effects for expository convenience, it can be seen that the effects on unconditional fertility are expected to be negative for the woman's predicted wage and positive for the predicted wage of her potential spouse, provided that the married fertility level is higher than the unmarried fertility level ($F^m - F^s > 0$). That is,

$$(7) \quad dF^t/d\hat{W}_f = (dM_f/d\hat{W}_f)(F^m - F^s) + (dF^m/d\hat{W}_f - dF^s/d\hat{W}_f)M_f + (dF^s/d\hat{W}_f) < 0,$$

and

$$(8) \quad dF^t/d\hat{W}_m = (dM_f/d\hat{W}_m)(F^m - F^s) + (dF^m/d\hat{W}_m - dF^s/d\hat{W}_m)M_f + (dF^s/d\hat{W}_m) > 0.$$

Welfare benefits may reduce the probability of a woman being married, since these benefits represent an alternative source of support, and also because poor families cannot normally qualify for AFDC benefits with an able bodied husband present. For these reasons, the welfare benefits may indirectly tend to reduce fertility, provided that the married fertility level exceeds the unmarried fertility level. At the same time, however, by relaxing the budget constraint for unmarried mothers, welfare benefits would tend to encourage child bearing among unmarried women. Thus a priori information is insufficient to determine the expected sign for the effect of welfare benefits on the unconditional fertility level. That is,

$$(9) \quad dF^t/dB_f = dM^f/dB_f(F^m - F^s) + dF^s/dB_f > 0.$$

V. DATA AND DESCRIPTIVE STATISTICS

In order to obtain racial samples of roughly equal size, observations for one in every 20 white women age 15-65 and for every other black woman age 15-65 were drawn from the one-in-a-thousand sample A of the 1980 U.S. Census of Population. In Table 2, the means and standard deviations for the variables are reported for black and white women age 15-24, 25-34, 35-44 and 15-65.

VI. INTERRELATIONSHIPS BETWEEN WELFARE AND EARNINGS

Predicted wage variables are needed as explanatory variables in equations for the probability that a woman is married and living with a spouse (Section VII) and for the number of children ever born (Section VIII). Wage participation equations are needed in order to obtain predicted wage variables that are corrected for the selection of women and their potential spouses into the samples of wage earners. The wage participation equations are also of interest in their own right.

1. Previous Research

There have been a number of cross-sectional studies specifically seeking to estimate the effects of the AFDC benefit parameters--the state determined guarantee levels and the federally determined benefit reduction rate--on measures of the labor supply of female heads. Moffitt (1992, p. 17) notes that this previous research "unequivocally shows that the AFDC program generates nontrivial work disincentives....", but he is of the opinion, that the estimated responses are too small to substantially alter the poverty picture or the optimal size of the AFDC program.

TABLE 2

MEANS AND STANDARD DEVIATIONS^a OF THE VARIABLES
FOR BLACK AND WHITE WOMEN, AGE 15-24, 25-34, 35-44, 15-65^a

Variables	Black				White			
	15-24	25-34	35-44	15-65	15-24	24-34	35-44	15-65
<u>Dependent Variables:</u>								
Currently married and spouse present (=1)	.115 (.319)	.438 (.496)	.485 (.500)	.347 (.476)	.255 (.436)	.669 (.459)	.801 (.400)	.606 (.489)
Children ever born	.563 (.941)	1.87 (1.57)	3.21 (2.44)	2.11 (2.45)	.126 (.602)	1.38 (1.31)	2.58 (1.68)	1.73 (1.83)
<u>Explanatory Variables:</u>								
Woman's predicted log hourly wage	.986 (.233)	1.40 (.204)	1.48 (.227)	1.24 (.332)	1.16 (.176)	1.45 (.200)	1.52 (.202)	1.40 (.252)
Potential spouse's predicted log hourly wage	1.21 (.187)	1.63 (.139)	1.79 (.144)	1.51 (.297)	1.53 (.182)	1.90 (.152)	2.09 (.165)	1.87 (.296)
Age (years)	19.3 (2.84)	29.2 (2.84)	39.1 (2.90)	34.5 (14.4)	19.5 (2.83)	29.3 (2.88)	39.2 (2.87)	36.6 (14.7)
Woman's property income (\$1000/year)	.0047 (.0948)	.0023 (.247)	.0046 (.794)	.0325 (.615)	.0531 (.513)	.0989 (.946)	.166 (1.48)	.258 (1.98)
Urban resident (=1)	.837 (.369)	.878 (.327)	.858 (.349)	.850 (.358)	.796 (.403)	.811 (.391)	.796 (.403)	.801 (.399)
Hispanic (=1)	.0141 (.118)	.0111 (.105)	.0141 (.118)	.0133 (.115)	.0728 (.260)	.0771 (.266)	.0633 (.244)	.0643 (.245)
AFDC benefits indicator (\$per month)	226. (68.2)	231 (69.4)	232 (69.0)	230. (68.9)	252. (73.6)	255. (73.8)	251. (73.0)	253.1 (73.1)
Medicaid Expenditures (\$per month)	123. (43.0)	126. (42.0)	129. (45.1)	126. (43.3)	127. (39.0)	130. (40.3)	129. (39.1)	129. (40.0)
Unemployed Parent (UP) AFDC expenditures (\$ per month)	6.70 (9.15)	7.42 (9.44)	7.32 (9.19)	7.13 (9.29)	9.97 (10.2)	10.4 (10.5)	10.2 (10.5)	10.1 (10.2)
Schooling (years completed)	11.1 (2.15)	12.3 (2.44)	11.4 (2.72)	11.1 (2.93)	11.4 (2.28)	13.0 (2.76)	12.3 (2.69)	11.9 (2.82)
Percent of Women with No Children	65.3	20.8	12.2	32.8	81.3	33.7	11.5	35.9
Sample size	2891	2255	1485	9075	2609	2362	1643	9752

Standard deviations are shown in parentheses. The predicted wage variables are obtained from equations reported in Tables A-1 and A-2 and discussed later in the text.

2. AFDC Effects on the Probability of Being a Wage Earner

In this study, as in most others based on cross-sectional data, the only variation in the welfare program variables is inter state. Coefficient estimates for probit equations for the probability of being a wage earner and for log wage equations are estimated jointly by maximum likelihood methods, and they are presented in Appendix Table A-1.³ The wage equations allow for different slope coefficients for primary (0-8 years), secondary (9-12) and higher (13 or more) years of schooling. A variable for years of potential work experience (i.e., age - schooling - 7) and the square of this experience variable are also included, as well as dummy variables for whether a woman resides in an urban area and for whether she is hispanic. The urban residence variable may capture the higher cost of urban living, with possible compensating higher wages. Hispanics are distinguished because of possible differences in language skills, immigrant status, and educational quality.

The probit equations for the probability of being employed include all of the variables in the wage equations plus three identifying variables: (1) the state-specific maximum period for receipt of unemployment benefits (a common measure of program generosity), (2) the state AFDC cash and food benefit level, and (3) the individual property income (i.e. dividends, interest, rents and royalties) from the census. These latter variables are all expected to increase the workers shadow value of not working and yet have no immediate effect on wage opportunities, thus providing a basis to identify the selection correction model.

³Self employed and family unpaid workers are included in the estimation sample, as well as the unemployed but searching for a job. Thus, the probit model estimates the probability of being in a wage or salary job, or not, and not whether the individual is in the labor force or not. This choice could be interpreted as involving a sequence of several choices and modeled somewhat differently.

The three variables specified to identify the selection-correction model--property income, unemployment benefits, and AFDC benefits--are jointly statistically significant according to the likelihood ratio test, for each of the four race-spouse samples, and generally contribute as anticipated to a reduction in the probability that a woman or her potential spouse works for wages. The coefficient for the variable representing the state-specific maximum number of weeks unemployment benefits can be collected is negative and statistically significant for black and white women and for the husbands of black women. The AFDC benefit indicator coefficient is also negative, and statistically significant for black women and their potential husbands as well as for the potential husbands of white women. The effect of property income owned by the woman is estimated nonlinearly (as a quadratic) and is jointly significant for white and black women and white women's potential husband.

The magnitude of the wage labor supply disincentive association with AFDC benefits is modest. As seen from the sample statistics in Table 2, the average level of the AFDC benefits is \$230 for all black women with a standard deviation of 69, and \$250 for white women with a standard deviation of 73. Evaluated at the observed proportion of women who are wage earners (.57 for black women; .61 for white women), a one standard deviation increase in the AFDC benefits is associated with a decrease in the probability of being a wage earner of .03 for a black woman and .01 for a white woman. Thus, the findings of this study lend support to the conclusion that the effects of welfare programs on work effort are clear but modest in magnitude.

VII. WELFARE EFFECTS ON MARITAL STATUS

There has been concern that the AFDC program might contribute to the decline of the two-parent family. Moffitt sums up the reasons for this:

Because benefits are paid primarily to female heads of family with children but with no spouse present..., the program provides an obvious incentive to delay marriage, increase rates of marital dissolution, delay remarriage, and have children outside of a marital union, all of which will lower the percentage of the population that is married. Virtually any model of marital status and childbearing behavior will have these implications.

(Moffitt, 1992, p. 27)

1. Previous Research

Previous studies using census data to examine the effects of AFDC and other welfare programs on marital status found few statistically significant patterns. Ellwood and Bane (1985) find fairly strong effects of AFDC on living arrangements (single mother) and increased divorce, based on a variety of estimation methods and data sources, including the 1960 and 1970 censuses. More recent studies based on the smaller Panel Study of Income Dynamics have focused on the association between welfare benefits and transitions over time among marital states. Hoffman, Duncan and Laren (1991) find that the state level of AFDC benefits does not affect the probability of divorce, but does influence the probability of a divorced woman receiving welfare. Hoffman and Duncan (1988) find that higher AFDC benefits reduce the transitions to remarriage. Hoffman, Duncan and Mincy (1991) find that women are more likely to be currently married, or unmarried but not on welfare, in states where AFDC benefits are less generous. Danziger et al (1982) consider the effects of the economic well being of women on their headship rates, and thereby infer a relatively small effect of AFDC benefits on female headship proportions.

Moffitt (1990) examines welfare effects on marriage using cross sectional data from the large 1967, 1977, and 1985 Current Population Surveys. He finds effects of AFDC on marriage and on female headship, which have increased over time for blacks and whites, and are statistically significant for 1985 even when regional controls are included in the regression. Based on both this micro data evidence and time series analyses, Moffitt concludes:

Although the studies of the 1980s show slightly stronger effects than the earlier studies, the effects are still generally small in magnitude. In particular, insofar as it is possible to determine, none of the studies finds effects sufficiently large to explain, for example, the increase in female headship in the late 1960s and early 1970s.

(Moffitt, 1992, p. 31)

However, previous studies have not controlled for many aspects of a woman's economic circumstances--wage opportunities and wealth--that could affect her decision about whether to live with a spouse. Also little attention has been paid to welfare programs other than AFDC.

2. Estimated Welfare Effects on the Probability of a Woman Living with a Spouse

Predicted log hourly wage rates for both the woman and for her potential husband are included in the probit equations for the probability of a woman being currently married with spouse present. Also the woman's property income variable is included (Cf. Schultz, 1990). The economic gains from marriage are expected to be lower for women who can command higher wage rates, lower for women who have more property income, and higher for women whose potential spouses have higher wage rates. The predicted wage variable is identified by the exclusion of her education and the state level unemployment program variable from the marriage

equation. An age variable, and dummy variables for residing in an urban area and for being hispanic, are also included, to correspond with the wage equations.⁴

Finally, three welfare variables are included in the equations for the probability of being currently married. The first is the AFDC monthly benefits. The second is the average benefits per family under the AFDC-UP program. And the third is the average Medicaid expenditures per AFDC family.⁵ AFDC-UP program was designed to counteract AFDC incentives for fathers to leave their families. Hence the reason for including this variable is obvious. Medicaid benefits could affect the probability of a woman living with a spouse, because she is eligible for these benefits if she has dependent children and in most circumstances no spouse. The ready availability of these benefits to single mothers and their families when on AFDC could reduce the gains to marriage.

Separate estimation results are presented in Table 3 for black and for white women in the age groups of 15-24, 25-34, 35-44 and 15-65, where the welfare and labor market conditions in 1979 are more likely to be relevant in determining the woman's expected opportunities across marital states for the younger samples, but the estimates do not change much when the welfare variables are lagged ten years for women aged 25-34 and 35-44. The results for the coefficients of the wage rate and property income variables are mixed, but largely in accord with a

⁴The quadratic terms in wages, property income and age are also omitted because narrower age brackets are the basis for estimation and most higher order terms became insignificant.

⁵Interactions between the woman's education and both medicaid and AFDC were jointly statistically significant at the .05 level in several of the age and race specific samples. The reason for including the AFDC-low schooling interaction variable is that women with low schooling levels would be expected to be more likely than others to alter their behavior in response to potential welfare benefits.

TABLE 3
PROBIT ESTIMATES OF PROBABILITY OF LIVING WITH A SPOUSE,
FOR WOMEN, BY RACE AND AGE^a

Explanatory variables	Black				White			
	15-24	25-34	35-44	15-65	15-24	24-34	35-44	15-65
Woman's predicted log _b hourly wage ^b	-1.22 (2.93)	.940 (2.99)	1.25 (2.91)	1.29 (7.12)	-1.66 (5.96)	-.617 (3.94)	-.547 (2.36)	-.477 (4.89)
Potential partner's predicted log hourly wage ^b	.787 (1.08)	-.499 (.84)	-1.42 (2.04)	1.42 (4.97)	1.33 (3.32)	1.56 (5.58)	.885 (2.67)	.948 (8.33)
Woman's property income per year (x10 ⁻³)	.0343 (1.35)	.0133 (.90)	-.0447 (.80)	-.0429 (1.52)	-.516 (2.30)	-.0206 (.77)	-.395 (2.06)	-.336 (5.02)
Age (years)	.792 (3.09)	.637 (2.89)	.375 (1.08)	.207 (13.8)	.960 (4.27)	.324 (1.44)	-.676 (1.72)	.188 (20.0)
Age Squared (x10 ⁻²)	-1.29 (2.11)	-1.05 (2.81)	-.450 (1.02)	.226 (12.9)	-1.65 (3.03)	-.518 (1.36)	.876 (1.76)	-.209 (19.0)
Urban resident (=1)	-.0473 (.40)	-.264 (2.79)	-.0166 (.16)	-.107 (2.34)	-.316 (3.54)	-.233 (2.89)	-.380 (3.67)	-.225 (5.90)
Hispanic (=1)	.296 (1.08)	.232 (.89)	-.403 (1.38)	-.0914 (.71)	.0757 (.59)	.168 (1.48)	-.285 (1.91)	-.0397 (.66)
AFDC benefits indicator (\$ per month x10 ⁻²)	.161 (1.85)	-.100 (1.51)	.104 (1.19)	-.093 (2.64)	-.171 (2.46)	-.114 (1.80)	-.0054 (.07)	-.0577 (1.82)
Medicaid expenditures (\$ per family per month x10 ⁻²)	-.332 (2.88)	-.117 (1.42)	-.230 (2.30)	-.181 (4.07)	-.175 (1.87)	-.245 (3.01)	-.0277 (.26)	-.0774 (1.87)
AFDC-UP expenditures (\$ per family per month x10 ⁻²)	.532 (.85)	.232 (.52)	-.228 (.40)	.232 (.94)	.0369 (.08)	-.503 (1.26)	.140 (.27)	.207 (1.01)
Intercept	-10.9 (4.26)	-9.67 (3.03)	-7.02 (1.03)	-3.38 (24.3)	-12.4 (5.65)	-6.26 (1.92)	13.2 (1.71)	-4.03 (30.6)
Chi squared statistic (10 df.)	384.8	67.3	22.6	1428.	735.8	90.6	40.3	2482.

^a Absolute value of asymptotic t ratio is reported in parentheses beneath probit coefficient.

^b Predicted log wage variable on the basis of the appropriate selection corrected wage equation in Table 3.

priori expectations, particularly for whites.⁶ Using a 10 percent critical region, the coefficient of the AFDC benefits indicator is significantly negative for black and for white women 15-24 years of age, but only at the 15 percent level at ages 25-34. The coefficient estimates for the AFDC-UP variable are never significantly different from zero. The coefficient estimates for the Medicaid variable, however, are generally significantly negative for both black and white women. The magnitudes of the significant coefficients on AFDC and Medicaid benefits are similar for black and whites, although the levels of marriage are much lower for blacks. Most studies of the marital status effects of welfare programs have overlooked the Medicaid program.⁷ It would be ironic if substantial numbers of husbands and fathers in low income families in the United States have opted to move out so that the mother and children could have access to basic health care that is provided on a universal basis in most other high income countries, such as Canada (Smeeding and Torrey, 1988). In terms of opportunities in the labor market, the theoretical expectation that the prevalence of marriage declines as women's wages increase relative to men's is

⁶No account is taken in the computation of the standard errors of the fact that the wage rates are predicted for women and their potential spouse based on auxiliary equations. It is likely, therefore, that all coefficient standard errors are biased and probably too small. Hypothesis tests based on the reported t ratios are thus likely to be weaker than reported.

⁷If the Medicaid expenditure variable is excluded from the marriage probit equation, the AFDC benefit variable has a negative and statistically significant coefficient at the 5 percent confidence level for black and white women aged 15-24 and 25-34, confirming the tendency others have noted (Moffitt, 1990) for marriage and female headship rates to be decreased and increased, respectively, by welfare benefit levels across states. Including Medicaid expenditures per AFDC family as an explanatory variable in the marriage probit equation always reduces the magnitude and statistical significance of the probit coefficient on the AFDC benefit indicator variable as expected given the .44 correlation between AFDC and Medicaid benefits shown in Table 1. These findings suggest that state health insurance programs (Medicaid) provided to poor families may be a greater deterrent to marriage than the cash and food stamp benefits provided under the AFDC program.

strongly confirmed for whites at all ages, and there is some support for the view that property income of the woman weakens the demand for marriage on her part, as observed in some other societies (Schultz, 1990). But increases in women's wages reduces the probability of marriage only among the youngest cohort of black women, age 14-25, and it appears to increase the likelihood of marriage among older black women.⁸

VIII. FERTILITY EFFECTS

To aid financially poor children is to lessen the expected financial burden of children for parents who would consider welfare an acceptable--perhaps even a planned--means of support for their children. Both the public and policy makers have feared that welfare programs might encourage out-of-wedlock childbearing and childbearing by women who realize their marriages may be unstable and who have limited financial means.

⁸Since information is also available on men's current marital status and whether they are residing with their wife, identically specified sample selection corrected wage equations (Table A-2) and probit marriage equations (Table A-3) are calculated for all men by age groups, relying in this case only on the male's characteristics. AFDC benefits continue to exert a disincentive effect on black men and the potential wives of black and white men to work as wage earners (Table A-2). Increases in men's wage opportunities are associated with an increased probability of men being currently married, and this pattern is statistically significant in all age and race groups except for blacks age 35-44 (Table A-3). The wage opportunities of their potential wives account significantly for a decreased probability of marriage for white men at all ages and for black men age 15-24. AFDC cash and food benefits are related to increased marriage among white males age 35-44, but not significantly in the other race or age samples. Medicaid expenditures are a statistically significant deterrent to marriage only among the youngest white men, whereas AFDC-UP expenditures are unexpectedly associated with a lower probability of marriage among white males age 15-24 and 35-44. In sum, the male side of the marriage market suggests the same strong role of sex-specific labor market opportunities on marriage, but less consistent signs than for women that the welfare system is an important factor determining current marital status.

1. Previous Research

Despite the concern, there has been relatively little research on the fertility effects of welfare programs. Leibowitz et al. (1986) report evidence that AFDC benefits increase the likelihood that a pregnant teenager will decide to keep her child, rather than resort to abortion. Ellwood and Bane (1985) find some increase in the fraction of never married women age 24-34 with children in higher AFDC benefit states. Duncan and Hoffman (1990) find a weak positive effect of AFDC benefit levels on the probability of out-of-wedlock births to mothers who subsequently receive AFDC payments, but no effect for mothers who do not subsequently receive AFDC payments. Using data for 1979-84 from the National Longitudinal Survey of Youth, Plotnick (1990) finds that the AFDC program raises the hazard rate for out-of-wedlock births for white teenagers. He finds no significant response pattern for blacks or hispanics. However, the smaller sample sizes for blacks and for hispanics may explain this latter result. None of the studies I know of has analyzed fertility of married and unmarried women together, which it was argued earlier is more likely to yield unbiased estimates. Many recent studies have also restricted their samples to teenage women who are responsible for only a small and presumably unrepresentative fraction of all births that might be affected by welfare benefits and labor market conditions.

2. Estimates of Welfare Effects on the Number of Children Ever Born

To examine whether higher welfare benefits are associated with higher fertility levels, the number of children ever born was regressed on the same variables included in the equations for the probability of a woman being currently married. Because the fertility variable is bounded at zero, Tobit as

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well as Ordinary Least Squares (OLS) estimates were compared, and even in the youngest age group of women, among whom two-third of the blacks were childless and three-fourths of the whites, the statistical significance of the Tobit and OLS coefficients are parallel and the slopes of the expected value locus are similar.⁹ Consequently, the easier to interpret linear OLS estimates are reported in Table 4 and discussed here, and the Tobits are presented for reference in Table A-4. As in the marriage equation, the wage variables are identified by the exclusion from the fertility equation of the woman's education and the state level unemployment program variable.

An increase in women's wage rates of 25 percent is associated, according to these estimates, with a decrease in number of children ever born by black women of .80 at age 15-24, .69 at age 25-34, and .69 at age 35-44. For white women the effect of the same percentage increase in female wages is to decrease fertility in these three age groups by .40, .49 and .36, respectively, all of which effects are significant statistically. The impact on fertility of wage opportunities of the potential husband is positive, as suggested by economic theory, and also larger among younger aged women, and becomes statistically insignificant at age 35-44. If these cross sectional age-specific estimates are assumed to trace out synthetically the effects of permanent changes in wages opportunities on a cohort's reproductive experience, then improved potential husband wage opportunities are associated with earlier childbearing, but not necessarily more children over the woman's entire lifetime, i.e. by age 35-44 the effects are insignificant and small. Conversely, increased female wage opportunities deters early childbearing (age 15-24), but this effect of early

⁹Ordered probit models were also estimated up to four or more children. Threshold values were reasonable and slope coefficients were similar to those implied by the OLS or Tobit models.

TABLE 4

ORDINARY LEAST SQUARES REGRESSIONS FOR CHILDREN EVER BORN
TO WOMEN, BY RACE AND AGE OF THE MOTHER^a

Explanatory variables	Black				White			
	15-24	25-34	35-44	15-65	15-24	24-34	35-44	15-65
Woman's predicted log _b hourly wage ^b	-3.62 (17.8)	-3.10 (8.71)	-3.10 (4.06)	-3.41 (13.3)	-1.81 (16.6)	-2.22 (15.9)	-1.63 (6.08)	-1.65 (15.8)
Potential partner's predicted log hourly wage ^b	2.28 (7.18)	1.59 (2.37)	.522 (.42)	2.44 (6.03)	.381 (2.59)	.603 (2.43)	.152 (.40)	.0656 (.53)
Woman's property income per year ($\times 10^{-3}$)	.174 (1.10)	.156 (1.26)	.0260 (.34)	-.103 (2.96)	-.0124 (.62)	-.0338 (1.32)	-.0806 (2.98)	-.0215 (2.88)
Age (years)	.586 (6.54)	.175 (.70)	1.55 (2.43)	.405 (19.3)	-.0999 (1.66)	.120 (.61)	.211 (.49)	.328 (33.1)
Age Squared ($\times 10^{-2}$)	-.851 (3.87)	-.0449 (.11)	-1.80 (2.22)	-.433 (17.4)	.620 (4.16)	.0509 (.15)	-.139 (.25)	-.319 (27.4)
Urban resident (=1)	.0908 (1.66)	-.243 (2.23)	.133 (.70)	-.243 (3.53)	-.0173 (.55)	-.0991 (1.45)	-.256 (2.36)	-.126 (3.20)
Hispanic (=1)	-.102 (.79)	-.607 (2.04)	-.719 (1.40)	-.0471 (.25)	.150 (3.44)	.592 (5.83)	.450 (2.46)	.531 (8.23)
AFDC benefits indicator (\$ per month $\times 10^{-2}$)	.0021 (.01)	.130 (1.71)	-.0544 (.34)	.0572 (1.05)	-.0675 (2.94)	.0382 (.70)	.0557 (.62)	-.0154 (.47)
Medicaid expenditures (\$ per family per month $\times 10^{-2}$)	-.106 (2.25)	-.368 (3.90)	-.376 (2.05)	-.343 (5.24)	-.0235 (.76)	-.147 (2.06)	-.0630 (.53)	-.0857 (1.97)
AFDC-UP expenditures (\$ per family per month $\times 10^{-2}$)	.258 (.99)	-.735 (1.43)	-1.49 (1.43)	-.521 (1.44)	.0833 (.54)	-.273 (.78)	-.633 (1.08)	-.0553 (.26)
Intercept	-6.66 (7.90)	-.682 (.19)	-25.6 (2.05)	-4.74 (25.2)	1.51 (2.77)	-.322 (.11)	-1.16 (.14)	-2.86 (21.8)
R ²	.268	.146	.113	.311	.247	.206	.081	.376

^a Absolute value of asymptotic t ratio is reported in parentheses beneath slope coefficient.

^b Predicted log wage variable on the basis of the appropriate selection corrected wage equation in Tables A-1 and A-2.

delay is neither augmented, nor does a compensating catching up in fertility appear to occur after age 34. It is interesting to note that if this 25 percent increase in wages benefits accrues to both women and their potential spouses, their fertility is expected to decrease by about one-third of a child for both black or white women. But if the wage opportunities of women improve relative to men, the depressing effects on fertility, and for that matter on marriage, are potentially more substantial.

The expectation that property income of the woman would be associated with her being better able to afford more children is not confirmed by the estimates. The only statistically significant coefficient on her property income variable in the age specific fertility regressions is for white women age 35-44, and in this case the coefficient is negative, contrary to expectation. Women in urban places of residence tend to have fewer children, while Hispanic women tend to have more children, other things being equal.

For white women in the 15-24 age group, the coefficient for the AFDC benefits is negative, whereas it is positive for black women age 25-34. There is no evidence that states which have more generous AFDC-UP programs have distinctly different fertility. However, the coefficient estimates for the Medicaid variable are always negative and uniformly statistically significant for black women and significant for white women age 25-34. These estimated effects of Medicaid on the fertility are at least twice as large for black women as for white women, within each age group.

According to Tables 3 and 4, those age and race groups in which the negative association between Medicaid expenditures and fertility is more significant are also groups in which the relationship between Medicaid and reduced marriage is observed. The Medicaid-fertility pattern could arise because

Medicaid provides either or both subsidized family planning information and supplies that reduce the cost of avoiding an unwanted birth, and a subsidy to health care of children and mothers that is generally unavailable to married mothers. The Medicaid coefficient estimates imply that a fifty percent increase in the state level of Medicaid reimbursements (amounting to an average of about \$65 per month per AFDC family) is associated with a reduction in fertility rates of black women age 15-24, 25-34 and 35-44 by .059, .239, and .244, respectively, and will reduce the fertility rates for white women age 15-24, 25-34, and 35-44 by .015, .096, and .041, respectively.

The intriguing question is precisely why the state welfare variables are associated with family behavior. Regardless, these results do suggest that there are significant associations between fertility, marriage, and labor supply and state welfare variables, underlining the importance of further research on this topic.

IX. CONCLUSIONS

This paper examines the effects of AFDC and food stamps, AFDC-UP and Medicaid on women's marital choices and fertility, controlling for the wage and unearned income opportunities facing different types of women and the men they are likely to marry. In studies in which these earnings effects are not controlled for, these labor market opportunities may be spuriously attributed to welfare variables, or biased by the analysis of marital status groups that are not representative of the population potentially affected by the welfare system.

In general, the estimated effects of the AFDC and Medicaid benefits variables on the probability of being currently married and on the number of children ever born are found to be often statistically significant and negative.

More generous Medicaid benefits are associated with lower probabilities for a woman being currently married and living with her husband. This also seems to be the case for AFDC benefits, at least for younger women, though the results are weaker than for Medicaid. Moreover, for fertility, the estimated Medicaid effects are consistently negative, while the AFDC effects are negative and statistically significant only for white women aged 15-24. The estimated effects of the AFDC-UP program are not significantly different from zero in either the marital status or the fertility equations. These findings demonstrate the importance of allowing for the possibility that different types of welfare programs, i.e. health care in contrast to cash and food benefits, may have qualitatively different effects on marital and reproductive behavior. Different age and educational groups are also found to be affected differently, but this may reflect the measurement of the policy variables in 1979 that may better approximate the relevant policy constraints on marriage and fertility decisions for the younger women in my 1980 census sample.

Although AFDC and Medicaid are found to have statistically significant effects on marital and fertility behavior, the estimated effects are modest in size. The results lend support to the conclusion that unintended effects of welfare programs on family decision making are not responsible for a large share of the observed increase in recent years in the number of lone mothers with dependent children. The relative improvement in wage opportunities of women compared to men is clearly the dominant factor that could explain changes in the prevalence of marriage and the level of fertility in the United States. Previous studies of marriage and fertility have not attempted, as in this paper, to control for the wage opportunities facing women and men. Among black women over Marriage.#4

age 25, who have increasingly remained unmarried (Bennett, 1989), evidence was found that with increases in women's wages, the probability of being currently married increases, although fertility may be expected to continue to decline among both black and white women as their labor market opportunities improve.

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TABLE A-1

PROBIT COEFFICIENT ESTIMATES FOR THE PROBABILITY OF WOMEN BEING A WAGE EARNER
AND SELECTION CORRECTED REGRESSION COEFFICIENT ESTIMATES FOR LOG WAGE EQUATIONS^a

Explanatory variables	For a black woman		For a white woman		For the expected spouse of a black woman		For the expected spouse of a white woman	
	Prob. of being a wage earner	Log of hourly wage	Prob. of being a wage earner	Log of hourly wage	Prob. of being a wage earner	Log of hourly wage	Prob. of being a wage earner	Log of hourly wage
Years of schooling								
Primary	-.030 (1.89)	-.024 (1.35)	-.036 (2.17)	.001 (.09)	-.019 (.98)	-.060 (3.27)	.007 (.40)	.049 (3.19)
Secondary	.244 (21.2)	.112 (4.46)	.204 (18.0)	.056 (1.66)	.101 (7.66)	.081 (3.94)	.087 (6.93)	.082 (7.18)
Higher	.160 (13.8)	.106 (7.47)	.049 (5.44)	.105 (13.9)	.065 (6.14)	.062 (4.42)	.019 (2.34)	.029 (4.95)
Potential experience	.054 (17.6)	.040 (7.17)	.004 (1.20)	.023 (10.7)	.098 (25.2)	.048 (2.95)	.125 (36.9)	.044 (4.58)
Potential experience ⁻¹ , squared ($\times 100^{-1}$)	-.108 (15.5)	-.078 (6.58)	-.040 (5.44)	-.035 (4.25)	-.202 (23.7)	-.093 (2.71)	-.276 (36.1)	-.078 (3.48)
Urban resident (= 1)	.010 (.24)	.199 (5.91)	.076 (2.24)	.122 (5.45)	-.098 (2.28)	.244 (4.99)	.001 (.04)	.203 (7.42)
Hispanic (= 1)	-.231 (1.97)	-.068 (.45)	-.035 (.65)	.017 (.53)	-.021 (.17)	-.106 (.82)	-.092 (1.63)	-.089 (2.00)
Woman's property income ⁻¹ ($\times 1,000^{-1}$)	.071 (1.83)		.012 (.72)		-.047 (.51)		.125 (10.4)	
Woman's property income ⁻¹ , squared ($\times 1,000,000^{-1}$)	-.0020 (1.55)		-.0012 (1.83)		-.001 (.07)		.0017 (1.52)	
Duration of unemployment benefits	-.0190 (2.78)		-.0133 (2.20)		-.0248 (3.40)		-.0026 (.42)	
AFDC benefits indicator ⁻¹ ($\times 100^{-1}$)	-.0851 (3.98)		-.0164 (.90)		-.0659 (2.92)		-.0646 (3.52)	
Intercept	-.023 (.12)	.607 (2.63)	.322 (1.70)	.814 (3.40)	-.624 (2.96)	1.17 (2.96)	-.869 (4.51)	.697 (3.27)
Sigma/rho	.829 (66.9)	.131 (.71)	.637 (83.9)	.065 (.16)	.813 (27.9)	.182 (.72)	.708 (91.4)	.100 (.61)
-Log likelihood	11804		11746		7737		10878	
Mean of dependent variable	.57 (.49)	1.40 (.87)	.61 (.49)	1.46 (.68)	.27 (.44)	1.80 (.83)	.49 (.50)	2.03 (.74)
Sample size	9075		9752		9075		9752	

^a The absolute value of the asymptotic t ratio is reported in parentheses below each coefficient. The numbers reported in the row labeled "sigma/rho" include first the standard error of the probit equations followed by the correlation of the errors from the probit wage earner and log-linear wage rate equations that are here estimated by joint maximum likelihood methods. Beneath both sigma and rho in parentheses is the ratio of this estimate to its standard error.

TABLE A-2

PROBIT COEFFICIENT ESTIMATES FOR THE PROBABILITY OF MEN BEING A WAGE EARNER
AND SELECTION CORRECTED REGRESSION COEFFICIENT ESTIMATES FOR LOG WAGE EQUATIONS^a

Explanatory variables	For a black man		For a white man		For the expected spouse of a black man		For the expected spouse of a white man	
	Prob. of being a wage earner (1)	Log of hourly wage (2)	Prob. of being a wage earner (3)	Log of hourly wage (4)	Prob. of being a wage earner (5)	Log of hourly wage (6)	Prob. of being a wage earner (7)	Log of hourly wage (8)
Years of schooling								
Primary	-.0494 (3.80)	.0133 (1.02)	-.0161 (1.03)	.0330 (3.02)	-.0057 (.36)	.0036 (.18)	.0612 (3.27)	.0375 (1.71)
Secondary	.2340 (19.1)	.0793 (2.64)	.2220 (18.0)	.0762 (5.22)	.1070 (7.11)	.0693 (3.11)	.0554 (4.30)	.0188 (1.54)
Higher	.1020 (7.15)	.0716 (6.21)	.0092 (1.11)	.0695 (16.8)	.1160 (10.3)	.0830 (4.17)	.0367 (5.40)	.0567 (9.05)
Potential experience	.0705 (20.6)	.0443 (5.17)	.0467 (13.1)	.0540 (16.3)	.1130 (24.5)	.0482 (3.10)	.0934 (25.8)	.0165 (1.57)
Potential experience ₋₁ squared ($\times 100^{-1}$)	-.1360 (17.9)	-.0643 (3.73)	-.1120 (14.0)	-.0863 (10.5)	-.1900 (20.4)	-.0812 (3.03)	-.1780 (22.5)	-.0218 (1.05)
Urban resident (= 1)	.0006 (.01)	.1750 (5.39)	.1100 (2.88)	.1470 (6.81)	-.0758 (1.55)	.1850 (3.20)	-.0790 (2.21)	.1120 (3.85)
Hispanic (= 1)	.0295 (.22)	-.0667 (.58)	.0954 (1.48)	-.0866 (2.40)	-.3100 (2.06)	.1640 (.77)	-.0097 (.16)	-.0360 (.75)
Woman's property ₋₁ income ($\times 1,000^{-1}$)	-.0251 (.56)		-.0453 (4.77)		.0366 (.96)		-.0252 (2.53)	
Woman's property income ₋₁ squared ($\times 1,000,000^{-1}$)	.00057 (.14)		.00032 (1.57)		-.00101 (.47)		.00015 (.55)	
Duration of unemployment benefits	-.0006 (.08)		.00354 (.51)		-.0232 (2.75)		-.0163 (2.55)	
AFDC benefits indicator ₋₁ ($\times 100^{-1}$)	-.1020 (4.29)		-.0135 (.64)		-.1250 (4.96)		-.0480 (2.55)	
Intercept	-.0389 (.21)	.6420 (5.45)	-.0946 (.48)	.6210 (4.98)	-1.050 (4.90)	.2250 (.58)	-1.230 (6.15)	.6590 (1.90)
Sigma/rho	.855 (115.)	.053 (.19)	.695 (149.)	.072 (.41)	.844 (22.8)	.284 (1.51)	.644 (36.6)	.156 (.66)
-Log likelihood	10930		12065		6195		8608	
Mean of dependent variable	.687 (.464)	1.62 (.901)	.796 (.403)	1.85 (.781)	.258 (.437)	1.46 (.843)	.346 (.476)	1.50 (.655)
Sample size	7762	5334	9334	7430	7762	2001	9334	3241

^a The absolute value of the asymptotic t ratio is reported in parentheses below each coefficient. The numbers reported in the row labeled "sigma/rho" include first the standard error of the probit equations followed by the correlation of the errors from the probit wage earner and log-linear wage rate equations that are here estimated by joint maximum likelihood methods. Beneath both sigma and rho in parentheses is the ratio of this estimate to its standard error.

TABLE A-3

PROBIT ESTIMATES OF PROBABILITY OF LIVING WITH A SPOUSE,
FOR MEN, BY RACE AND AGE^a

Explanatory variables	Black			White		
	15-24	25-34	35-44	15-24	24-34	35-44
Man's predicted log hourly wage ^b	6.99 (3.29)	2.50 (2.31)	1.57 (1.14)	1.88 (1.82)	2.59 (4.29)	1.43 (2.23)
Potential partner's predicted log hourly wage ^b	-8.17 (3.30)	-.979 (.88)	-.645 (.48)	-2.37 (2.39)	-1.83 (3.03)	-1.44 (1.74)
Man's property income per year ($\times 10^{-3}$)	-.0522 (.23)	.0579 (.52)	-.0228 (.88)	-.109 (.97)	-.0341 (1.94)	.0039 (.22)
Age (years)	.929 (1.82)	.235 (.97)	-.101 (.25)	.878 (2.67)	.210 (.91)	-.0698 (.17)
Age Squared ($\times 10^{-2}$)	-1.24 (1.05)	-.350 (.86)	.101 (.20)	-1.50 (1.97)	-.351 (.90)	.100 (.19)
Urban resident (=1)	.511 (2.34)	-.108 (.96)	-.139 (.95)	-.289 (2.97)	-.294 (3.71)	-.235 (3.13)
Hispanic (=1)	2.71 (4.25)	.133 (.37)	.131 (.29)	.326 (2.23)	.242 (1.95)	.0232 (.15)
AFDC benefits indicator (\$ per month $\times 10^{-2}$)	-.0216 (.20)	-.0926 (1.26)	.157 (1.59)	-.0966 (1.25)	-.0393 (.63)	.164 (1.91)
Medicaid expenditures (\$ per family per month $\times 10^{-2}$)	-.0911 (.64)	-.139 (1.57)	.135 (1.20)	-.190 (1.80)	-.109 (1.35)	-.0302 (.26)
AFDC-UP expenditures (average per family per month $\times 10^{-2}$)	.476 (.62)	.346 (.72)	-.589 (.95)	-10.7 (2.01)	.0652 (.17)	-1.11 (2.01)
Intercept	-18.4 (3.30)	-6.38 (1.78)	.682 (.09)	-11.7 (3.41)	-4.39 (1.32)	1.22 (.15)
Chi squared statistic (10 df.)	363.6	118.9	22.4	562.6	111.2	30.0
Mean of dependent variable	.0717 (.258)	.473 (.499)	.627 (.484)	.157 (.364)	.669 (.471)	.817 (.387)
Sample size	2721	1968	1200	2558	2315	1596

^aAbsolute value of asymptotic t ratio is reported in parentheses beneath probit coefficient.

^bPredicted log wage variable on the basis of the appropriate selection corrected wage equation in Table A-1.

TABLE A-4

TOBIT ESTIMATES FOR CHILDREN EVER BORN
TO WOMEN, BY RACE AND AGE OF THE MOTHER^a

Explanatory variables	Black				White			
	15-24	25-34	35-44	15-65	15-24	24-34	35-44	15-65
Woman's predicted log _b hourly wage ^b	-7.91 (14.9)	-4.13 (9.18)	-3.07 (3.55)	-3.98 (10.8)	-6.93 (11.4)	-3.68 (16.9)	-1.86 (6.11)	-2.42 (15.6)
Potential partner's predicted log hourly wage ^b	5.18 (6.34)	2.46 (2.94)	.109 (.08)	2.90 (5.04)	2.29 (3.41)	1.67 (4.58)	.450 (1.05)	.675 (3.82)
Woman's property income per year ($\times 10^{-3}$)	.267 (.73)	.233 (1.32)	-.0345 (.41)	-.123 (2.67)	-.900 (1.79)	-.0380 (1.06)	-.219 (3.74)	-.0246 (2.39)
Age (years)	2.41 (9.50)	.359 (1.16)	1.78 (2.49)	.682 (22.8)	1.66 (4.63)	.465 (1.61)	.278 (.57)	.584 (38.8)
Age Squared ($\times 10^{-2}$)	-4.62 (7.49)	-.315 (.60)	-.207 (2.28)	-.742 (21.0)	-2.72 (3.14)	-.442 (.90)	-.216 (.35)	-.588 (33.6)
Urban resident (=1)	-.210 (1.48)	-.296 (2.22)	-.180 (.84)	-.299 (3.13)	-.289 (2.04)	-.188 (1.91)	-.297 (2.46)	-.278 (4.86)
Hispanic (=1)	-.0697 (.21)	-.575 (.36)	-.688 (1.20)	.0089 (.03)	.737 (3.75)	.870 (5.98)	.527 (2.60)	.888 (9.46)
AFDC benefits indicator (\$ per month $\times 10^{-2}$)	.0341 (.34)	.135 (1.45)	-.0816 (.46)	.0734 (.97)	-.292 (2.49)	.0540 (.69)	.0614 (.61)	-.0463 (.95)
Medicaid expenditures (\$ per family per month $\times 10^{-2}$)	-.237 (1.89)	-.410 (3.53)	-.417 (2.03)	-.470 (5.11)	-.251 (1.59)	-.227 (2.17)	-.0863 (.65)	-.162 (2.53)
AFDC-UP expenditures (\$per family per month $\times 10^{-2}$)	.357 (.52)	-.864 (1.36)	-1.69 (1.44)	-.636 (1.25)	.987 (1.30)	-.338 (.66)	-.708 (1.08)	-.191 (.60)
Intercept	-28.2 (11.4)	-3.83 (.85)	-29.7 (2.12)	-10.6 (36.9)	-18.0 (5.09)	-6.36 (1.50)	-2.90 (.31)	-8.60 (37.4)
Sigma	1.72 (39.5)	1.75 (57.0)	2.56 (49.6)	2.65 (106.)	1.67 (26.4)	1.61 (51.8)	1.79 (52.3)	1.94 (106.)
Loglikelihood (-)	2799.0	3988.7	3277.1	16551.	1504.1	3612.0	3126.3	14971.

^aAbsolute value of asymptotic t ratio is reported in parentheses beneath Tobit coefficient.^bPredicted log wage variable on the basis of the appropriate selection corrected wage equation in Tables A-1 and A-2.