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ABSTRACT

Previous research has found that the income of divorced/separated mothers who receive child support exceeds the income of those who do not by more than the value of child support income, because women with a child support award are more likely to work and to work longer hours than women with no award. This paper analyzes the impact of child support of AFDC participation and labor supply in a multiple regression framework using the combined 1979/1982 Match Files of the CPS. It attempts to correct for the fact that women with child support income also differ in other ways (some observable and some not) from women without child support. The results have policy implications for current efforts designed to improve enforcement of existing child support contracts and to increase the percentage of women due child support.

I. Introduction

According to recent estimates, as of Spring 1984, there were 8.7 million women in the United States living with children under 21 years of age whose fathers were not living in the household (U. S. Bureau of the Census, 1985, Table 1). The mean 1983 total money income of these women was $13,132 if child support was received from the children's father, $8,433 if child support was due but not received, and $7,389 if child support was not awarded. Among the families with child support income, the average amount received was $2,341. Thus, families with child support income are better off financially than those without, and by considerably more than the amount of child support received. Unfortunately, many eligible women receive no child support: Only 58 percent have a child support award and only 35 percent actually received some child support income in 1983.

The main reason that the overall income difference between women who receive child support and those who do not exceeds the value of the child support income is that women awarded child support are more likely to work or work longer hours than women not awarded child support. This was first observed by Grossman and Hayghe (1982) and supported by more recent work of Beller and Graham (1985), O'Neill (1985) and Robins and Dickinson (1985). In addition, Beller and Graham demonstrate that among women due child support income, those who receive the most are even more likely to work or to work longer hours. At face value, these findings appear somewhat

surprising. It is well-known that AFDC income--a public transfer--deters labor supply (Danziger, et al, 1981). Why, then, should child support income--a private transfer--encourage labor supply? Indeed, basic economic theory suggests that all nonwage income should deter work effort. What makes child support income appear to be different?

The purpose of this paper is to examine empirically the effect of child support income on hours worked of currently divorced or separated mothers who head their own family, roughly 4.7 million of the 8.7 million women eligible for child support. (We exclude remarried and never-married mothers from our analysis since their current living arrangements and labor supply appear to be very different.) The data set upon which our analysis is based is the combined 1979 and 1982 March/April Match Files of the Current Population Surveys, the surveys previous to the one that forms the basis for the national estimates reported above.

Understanding the labor supply behavior of women with and without child support income is important for those who make public policy regarding welfare and child support. Title IV-D of the Social Security Act (1975) required all states to establish programs to aid in the collection of child support payments. In 1984 this was amended to require states, among other things, to use expedited judicial and administrative procedures to establish child support orders and to withhold wages and intercept tax refunds to collect

overdue payments. If these efforts succeed, then several important questions need to be addressed. First, what will happen to the labor supply of those women already due child support, if, on average, they receive more of the support due them? Second, what will happen to the labor supply of those mothers who suddenly obtain a child support award for the first time? Finally, to what extent will all of this reduce the reliance of these women on AFDC and other forms of public assistance?

The plan of the paper is as follows. Section II examines the theoretical impact of child support income on hours worked among women potentially eligible for AFDC payments. Section III reviews the data used in the empirical analysis. Section IV discusses various econometric issues and presents estimates of the determinants of labor supply, welfare participation and child support income. Section V examines policy implications of the empirical estimates and suggests an agenda for future research.

II. A Theory of Labor Supply

A. With Child Support Income Exogenous

In a standard textbook theory of labor supply, the impact of child support income on hours worked would be unambiguous. In that theory, hours worked, H, depend upon the market wage rate, W, and nonwage income, N:

(1) $$H = f(W, N(CS))$$

If leisure is a normal good, then H depends negatively upon N. Child support, CS, is a component of nonwage income, and therefore has a negative effect upon hours worked. It may, however, have a somewhat different (that is, stronger) effect than other forms of nonwage income, since child support is not subject to income taxes.

Burtless and Hausman (1978), Moffitt (1983) and Robins (1984), among others, argue that this standard theory needs to be modified when it is applied to female family heads who face the option of obtaining public assistance (AFDC, for short). According to Burtless and Hausman, government transfer programs such as AFDC introduce nonlinearities into the budget set that "affect both the marginal wage and the 'virtual' nonlabor income [that is, nonwage income at H=0] which the individual faces" (p. 1103). Similarly, Moffitt argues that the behavior of female family heads needs to be modelled as "a two-equation demand system, representing the joint choices of labor supply and participation in [AFDC]" (p. 1024).

The AFDC program offers a woman an income guarantee, G, (following the notation used by Moffitt) which varies with her state of residence and family size. Actual AFDC benefits received equal G - tWH - rN, where t is the marginal tax rate on earnings and r is the tax rate on nonwage income. It follows that benefits at zero hours of work, G, equal G - rN. Thus, the labor supply theory of equation (1) can be rewritten as:

(2) $$H = f(W(1-tP), N + GP)$$

where P equals 1 if the woman participates in the AFDC program and 0 if she does not.

If P were exogenous, then equation (2) would represent but a small and uninteresting variation on equation (1). What makes it interesting is that P, itself, is a choice variable. The decision whether or not to participate in the AFDC program should depend upon whether utility is greater with P=1 or P=0. If utility depends upon total income and leisure, then one can define the indirect utility function, V, to be the value of utility obtained from substituting H from equation (2) into the direct utility function. Then the AFDC participation decision is a function of the utility difference P*:

(3) $$P^* = V(H \text{ given } P=1) - V(H \text{ given } P=0)$$

Because H is a function of wages and nonwage income, equation (3) can be rewritten as:

(3') $$P^* = V(W(1-t), G+(1-r)N) - V(W, N)$$

and the choice of P can then be written as:

(4) $P = 1 \quad \text{if} \quad P^* > 0$

$P = 0 \quad \text{if} \quad P^* < 0$

The choice of H and P is shown diagramatically in Figure 1 for a woman who is potentially eligible for AFDC (that is, for G > 0, or G > rN). If the woman chooses not to go on welfare, she faces the budget constraint L'N Y'. If she chooses welfare, her budget constraint is L'(N+G) Y". Thus, overall, her budget constraint is the kinked line L'(N+G) B Y'. If utility is maximized along the line segment B Y', say at point E_1, she chooses not to go on welfare and to work L'-H_1 hours. If utility is maximized along the line segment (N+G) B, say at point E_2, she goes on welfare and works L'-H_2 hours. Finally, if utility is maximized at point (N+G), she goes on welfare but does not work.

How does child support income affect labor supply? From equations (2) - (4) it can be seen that an increase in N (due to an increase in child support) has two effects: first, according to equation (2), an increase in N given P reduces hours worked; second, according to equation (3'), an increase in N lowers P* which, according to equation (4), reduces welfare participation and, according to equation (2), increases hours worked. Thus, the effect of child support on hours worked might be indeterminant empirically in a sample composed of both AFDC participants and nonparticipants. The reason is that women who receive child support are likely to work less than those who do not and

are not AFDC participants, but more than those who do not and are AFDC participants.

B. With Child Support Income Endogenous

Both the simple theory of labor supply in equation (1) and the simultaneous equation model of labor supply and welfare participation in equations (2) - (4) assume that child support income is exogenous. This assumption has at least some validity since it could be argued that a woman's receipt of child support depends upon whether or not her ex-husband pays support and how much he pays out of what he owes. To the extent that his payment (or nonpayment) of child support is unrelated to her behavior directly, or to factors which affect her behavior, then child support income may indeed be exogenous to her. However, there is considerable evidence (Beller and Graham, 1985; O'Neill, 1985) that the receipt of child support is affected by factors over which the woman has some control. In other words, like labor supply and welfare participation, child support is a choice variable.

Following Beller and Graham (1985), we posit that the amount of child support a woman receives depends upon her ex-husband's ability (and desire) to pay, and upon the amount of support due her. The amount of support due, in turn, depends upon the financial needs of the woman and her children, her ex-husband's ability to pay, and the legal environment at the time of marital disruption. Thus, the

amount of support she actually receives depends upon her own actions (or factors that affect her behavior) both because her actions affect whether or not she has a child support award (and the value of that award), and because her actions may influence her ex-husband's willingness to pay the support he owes. For example, she can decide whether or not to make use of the services of the state's child support (IV-D) office to help obtain an award and/or enforce payment.

The preceding discussion suggests the following "reduced form" equation for child support received, CS:

(5) $$CS = g(X_{observed}(H,P,..), X_{unobserved})$$

where $X_{observed}$ is a vector of observable variables reflecting her needs, his ability to pay, or the legal environment, and $X_{unobserved}$ is a vector of unobservable variables to be discussed below.

Among the observable factors which affect the amount of child support income a woman receives may be her labor supply (H) and public assistance status (P). For example, the amount of child support the courts award her may depend upon her (anticipated) labor supply. Alternatively, her husband's willingness to pay support may depend upon his perception of her financial needs which he forms by observing her welfare status or hours of work. Finally, it may be that neither H nor P affect CS directly, but that some other observable factors--such as her age and education, or the number of children--influence all three

decisions. In either case, to determine the effect of CS upon H and P, equations (2)-(5) must be estimated simultaneously.

There may be some important variables that affect the amount of child support income received that are not observable to the researcher. These could include the financial well-being of the ex-husband, his emotional attachment to his children, and the woman's self-determination or initiative to either "make it on her own" or "make sure he pays". As long as these unobservables have no impact upon the woman's labor supply or welfare participation decisons, then it is still possible to estimate the impact of CS upon H and P. If, however, these unobservable factors also affect H and P directly, then it may not be possible to assess the true effect of CS on H and P even in a simultaneous equation system.

III. Description of the Data

The data sets upon which our empirical analysis is based are the 1979 and 1982 March/April Match Files of the Current Population Survey (CPS). Special supplements to the April 1979 and 1982 CPS were administered to all women 18 years of age and older (living with own children under 21 years of age whose father was not a member of the household) to obtain information on marital history and the award and receipt of child support and alimony payments. These data were then matched with the woman's labor market, income and demographic data from the March CPS. We combined both years of data to obtain a sample of 4004 divorced or separated female family (or subfamily) heads. Missing data reduce the sample size to 3827 cases in the regressions reported below.

In the full sample of 4004 cases, 73 percent of the women report being in the labor force in March of the survey year (1979 or 1982) and report having worked an average of 1243 hours in the year prior to the survey. Mean total personal income in 1978 dollars is $7,612. 28 percent of the women received some income from public assistance (AFDC) and 44 percent received some income from child support. There are significant differences, however, between the 58 percent of the sample due child support and the 42 percent not due child support in the year prior to the survey. The March labor force participation rate is 80 percent for those due support and only 63 percent for those not due support. Mean hours worked are 1401 for the first group, and only

1022 for the second. Mean total personal income is $9029 among women due child support, but only $5631 among those not due support. Furthermore, less than half of this difference is accounted for by the $1314 of child support received on average by those due support. Finally, 23 percent of those due child support and 35 percent of those not due child support received some AFDC income.

The details of the construction of the AFDC variables used in the analysis are described in Appendix C. To summarize briefly, the annual income guarantee, G above or AFDCMAX in the tables below, was obtained from official government statistics for all states and family sizes. Potential AFDC benefits at zero hours of work, G above or AFDCEXP in the tables below, is obtained by subtracting all personal nonwage income from the state's payment standard (adjusted for family size). This calculation assumes that r, the tax rate on nonwage income, is 100 percent, which, according to Robins (1984), is the official tax rate in all but two states. Fraker, Moffitt and Wolf (1985) present estimates of effective tax rates and income guarantees for 1967-82, which differ substantially from official statistics. We do not use their statistics because they were not available for all 50 states in 1978 and 1981, and because they differ rather markedly from other estimates supplied by Robins (1984).

IV. Empirical Analysis

A. Estimates of Labor Supply with Both Child Support and AFDC Payments Assumed to be Exogenous

Table 1 presents OLS estimates of the determinants of hours worked by divorced or separated female family heads under the assumption that both welfare participation and child support income are predetermined. HOURS equals annual hours worked during the year prior to the survey, calculated as weeks worked times average hours per week.

According to equation (2), one determinant of labor supply is a vector of personal characteristics intended to reflect differences in preferences and wages across women. This vector includes measures of her age, education, race, location, family size and household composition. The other determinant of hours worked is nonwage income, which is disaggregated into AFDC, child support, alimony, and other family income. We separate nonwage income into components, because AFDC and child supports payments, unlike other forms of income, are not subject to income taxes, and because of our interest in assessing the effects of these two income sources on labor supply. All variables are defined in appendix Table A and their means and standard deviations are presented in appendix Table B.

In each of the regressions, all variables representing taste or wage differences are of the expected sign and are usually significant. Women who are older (AGE, AGESQ), more educated (EDUC), have previous work experience (PREVWORK) or

older children (KIDS<3, KIDS<6, KIDS<18), and are not black (BLACK) are more likely to work longer hours than other women. These variables tend to remain significant in all regression tables and will not be discussed further.

Table 1 also includes measures of nonwage income. Total nonwage family income excluding child support, alimony, and AFDC payments (OTHER INC) has a negative and significant effect on hours worked. So too does alimony income (ALIMONY), and its coefficient is even more negative. This is consistent with the view of Becker (1981) that alimony represents a payment to women who previously specialized in work at home instead of work in the market.

Unlike other forms of nonwage income, child support payments do not appear to reduce hours worked. In both cols. (1) and (3) the coefficient on child support income (CS) is positive, and in col. (3) it is statistically significant at a one percent level. In cols. (2) and (4) when a dummy variable indicating whether or not child support is due (CSDUE) is added to the regression, the coefficient on CS declines, although not enough to become significantly negative. The coefficient on CSDUE is itself positive and significant, indicating that women due child support work more than those not due support.

The final type of nonwage income, AFDC income, is captured in two different ways. In cols. (1) and (2), a dummy variable indicating whether or not the woman receives any AFDC income (PA) appears along with benefits at zero

hours of work (AFDC, which equals AFDCEXP*PA). As expected, the coefficient on PA is very large and negative, indicating that, ceteris paribus, women on welfare work 912 to 919 fewer hours per year than women not on welfare (who work on average 1594 hours per year). The coefficient on AFDC is small and insignificant, so that among women on welfare, differences in expected benefits appear to have no effect on hours worked. Cols. (3) and (4) include a single measure of welfare for all women--AFDCEXP--which equals potential AFDC payments at zero hours of work, or G, as discussed in section II above. Its coefficient is small and insignificantly different from zero.

B. Estimates of Hours Worked and Welfare Participation With Child Support Income Assumed to be Exogenous

In this section we continue to assume that child support income is exogenous, but allow welfare participation to be simultaneously determined with labor supply. Let PA equal one if a woman received any AFDC income in the year prior to the survey and zero otherwise. Estimates of the determinants of PA (including a vector of a woman's personal characteristics and state-specific AFDC eligibility requirements) were obtained by maximum likelihood probit. Probit coefficients, asymptotic T-ratios, and estimated partial derivatives (see table footnotes for an explanation of this calculation) are presented in Table 2.

According to these estimates, women are significantly more likely to be welfare participants if they are black,

live in the northeast, live in a central city, or have more children between the ages of 6 and 18. They are less likely to be welfare participants if they live in the south, live in the suburbs, are more educated, are older, live with another adult, or are in a subfamily.

Nonwage income also affects welfare participation. The larger is the AFDC guarantee provided by the state (AFDCMAX), the more likely a woman participates: each additional $1000 raises the probability of her participation by 4.7 percent. The larger is a woman's nonwage personal income excluding child support (INCEXCS), the less likely she participates: each additional $1000 reduces the probability of participation by 3.6 percent. Finally, child support income also reduces welfare participation. Women due child support (CSDUE) are 3.3 percent less likely to choose AFDC than women not due support, and each $1000 of child support received (CS) reduces this probability by an additional 2.1 percent. Thus, compared to a woman not due child support, a woman who receives $2000 of child support is 7.5 percent less likely to be on welfare.

The theory presented in Section II suggests that estimates of labor supply that take AFDC payments as given will be biased when hours worked and welfare participation are jointly determined. One way to obtain consistent estimates would be to estimate the determinants of HOURS and PA simultaneously, a procedure followed by Moffitt (1983). Because PA is dichotomous while HOURS is continuous (but

truncated at zero), conventional simultaneous equation techniques are not appropriate. Instead, Moffitt uses a nonlinear maximum likelihood method proposed by Heckman (1978) and Lee (1979).

We use an alternative method of estimation. First, we estimate separate hours regressions for welfare participants (PA=1) and non-participants (PA=0). These results are reported in cols. (1) and (3) of Table 3. However, this procedure introduces the well-known problem of sample selection bias: estimates of the determinants of hours worked will be biased unless we take explicit account of the sample selection rule. We follow a two-step procedure proposed by Heckman (1978, 1979) to eliminate this bias. First, we use the probit coefficients (B) from the PA regression reported in Table 2 to construct

(6) LAMPA =PA*f(XB)/F(XB) - (1-PA)*f(XB)/(1-F(XB))

where X is the vector of determinants of PA, f is the standard normal density function and F is the standard normal cumulative distribution function. Second, we include LAMPA as an additional regressor in the hours regressions. These results appear in cols. (2) and (4) of Table 3. Finally it should be noted that in the presence of sample selection bias, OLS-generated standard errors are biased. Heckman (1979) suggests a correction factor, which was itself corrected by Green(1981). However, in view of the preliminary nature of our analysis, we make no attempt to implement this cumbersome procedure.

The labor supply behavior of welfare participants is not well explained by the vector of independent variables in cols. (1) and (2). First, compared with the full-sample estimates reported in Table 1, few personal characteristics are now significant. Second, nonwage income appears to have either no effect or a positive effect on hours worked. Women due child support (CSDUE) work significantly more than women not due support. However, one important determinant of hours worked is LAMPA itself. From equation (6) notice that LAMPA is a decreasing function of F(XB), the probability of being on welfare. Thus the positive coefficient on LAMPA suggests that women on welfare who are the least likely to be in the welfare sample work longer hours than women who are the most likely to be in the welfare sample.

These same variables explain the labor supply of women not receiving welfare much better, judging by the greater number of significant coefficients and higher adjusted R^2 in cols. (3) and (4). All forms of nonwage income appear to reduce hours worked, although the coefficient on child support income received is not significant. As before, women due child support (CSDUE) are likely to work longer hours than those not due support. The large negative coefficient on LAMPA suggests that women not on welfare who are the most likely to be welfare participants (and thus have the smallest LAMPA values) work more hours than women who are the least likely to be welfare participants. In

other words, these potential welfare mothers are not on AFDC because they have a high taste for work and income and/or a low taste for welfare.

Heckman has argued that sample selection bias can be viewed as the bias that arises from an omitted variable (where LAMPA is the omitted variable in our case). Thus, the estimated coefficients in cols (1) and (3) are biased, while those in cols. (2) and (4) are unbiased. Our results indicate that in a sample of AFDC participants the effect of child support on hours worked will be biased upward unless we account for the probability of being in the sample. The bias is positive because women with child support income are also the ones least likely to be in the sample (with the largest values of LAMPA), and most likely to be working. Similarly, in the sample of AFDC nonparticipants, the effect of child support on hours worked will be biased downward unless we include LAMPA. From the probit results in Table 2 we know that women who do not have child support are the most likely ones to be on AFDC, and thus from equation (6), to have the smallest values of LAMPA. But, these women are in the sample of AFDC nonparticipants because, ceteris paribus, they also are the women most likely to work. Thus, ignoring LAMPA, we underestimate the true effect of child support on hours worked.

C. Estimates of Hours Worked and Child Support Income With Welfare Participation Assumed to be Exogenous

In this section we assume that welfare participation is given, but that hours worked and child support are jointly determined. Following Beller and Graham (1985) we use maximum likelihood probit to estimate the determinants of whether or not a woman is due child support in the year prior to the survey. Let CSDUE equal one if child support is due and zero otherwise. Determinants of CSDUE include a vector of characteristics of each woman to capture her financial needs and her ex-husband's ability to pay, and measures of the legal environment at the time of the marital disruption. Table 4 reports probit coefficients, asymptotic T-ratios, and estimated partial derivatives.

According to these results, women are significantly more likely to be due child support if they are more highly educated, have previous work experience, have older children or more children, live in the northcentral states, or live in the suburbs. They are less likely to be due support if they are black, are separated but not divorced, live in the south, live in a central city, or are members of a subfamily. The coefficients on TIME and LAW suggest that since 1960 there has been a secular increase in the probability of being due child support, but that since 1975 the increase has abated. Finally, the probability of being due child support is affected by some forms of nonwage income. The greater the amount of alimony received (ALIMONY), the more likely a woman is also due child

support. ALIMONY is probably an indicator of her ex-husband's ability to pay and of her degree of specialization in home production. Living in a state that offers more generous AFDC income guarantees (AFDCMAX) reduces the probability of being due child support. Generous AFDC guarantees may discourage a woman from seeking an award. Other forms of nonwage income appear to have no effect on the probability of child support being due.

If CSDUE is determined by some of the same omitted variables that determine HOURS, then the coefficient on CSDUE in an hours regression will be biased. To obtain consistent estimates of the effect of a "treatment" variable (CSDUE, in our case) on a "choice" variable (HOURS) when treatment is itself a matter of choice, Barnow et al (1980) propose including LAMCS as an additional regressor in the full-sample hours regression, where LAMCS equals:

(7) LAMCS = CSDUE*f(YA)/F(YA) - (1-CSDUE)*f(YA)/(1-F(YA))

and Y is the vector of determinants of CSDUE and A their probit coefficients. Thus LAMCS is negatively related to F(YA), the probability of being due child support.

Cols. (1) and (2) of Table 5 present regression estimates of hours worked that take account of the endogeneity of child support, by including the variable LAMCS. The negative coefficient on LAMCS means that, ceteris paribus, women whose characteristics assign them the highest probability of being due child support (and thus the smallest LAMCS values) work less than other women. These

regression results can be compared to the otherwise identical (but biased) regressions in cols. (2) and (4) of Table 1 that omit LAMCS. The most obvious difference is that the unbiased estimate of the coefficient on CSDUE in Table 5 is larger than the biased estimate in Table 1. The bias occurs because we fail to control for the probability of being due child support. From the coefficient on LAMCS, we know that women not due child support who share similar characteristics with women due support are already likely to work long hours, so the actual receipt of child support appears to have only a small positive impact on hours worked in Table 1. But controlling for the probability of being due child support, as in Table 5, we see that a woman due support works up to 652 more hours annually than an otherwise identical woman not due support.

It is important to add a caution in interpreting the coefficient on CSDUE in Table 5. We are not controlling for the probability of being on public assistance, as we did in Table 3. Thus, part of the explanation for the seemingly large effect of CSDUE on hours worked may be that women not due child support are much more likely to obtain welfare which reduces their incentive to work or to seek child support.

To investigate the impact of dollars of child support income received (CS) on hours worked, we estimate an hours regression in col. (3) that is restricted to the sample of women due support. While this introduces the possibility of

sample selection bias, notice that LAMCS in equation (7) is exactly the "omitted variable" that Heckman's procedure would add to the regression to eliminate this bias. We implement this procedure and report the results in col. (4). Consistent with earlier findings, the large negative coefficient on LAMCS suggests that, ceteris paribus, the more likely a woman is to be due child support (the smaller is LAMCS), the more she works.

Theory predicts that the coefficient on CS in col. (3) will be biased, but in practice the bias appears to be rather small. Since LAMCS and CS are negatively correlated, and since the coefficient on LAMCS in col. (4) is negative, the direction of the bias is negative. In either column the coefficient on CS, although negative, is extremely small and statistically insignificant.

D. Simultaneous Equation Estimates of Hours Worked, AFDC, and Child Support Income

Economic theory suggests that hours worked, AFDC participation and child support income are jointly determined, either because each decision is directly affected by the other two, or because all three decisions are affected by a commom set of variables. In this section we estimate jointly the determinants of hours worked (HOURS), annual welfare payments received (PAAMT), and dollars of child support income received (CS). Each of these variables is continuous, but truncated at zero. Nevertheless, as a first-approximation, we ignore the

truncation and employ conventional two-stage least squares to estimate the simultaneous-equation system.

We postulate the following model:

(8.1) HOURS = h(Z, PREVWORK, CS, PAAMT)

(8.2) PAAMT = p(Z, AFDCMAX, CS, HOURS)

(8.3) CS = c(Z, PATERNITY, CSVOL, SEPARATED, TIME, LAW, PAAMT, HOURS)

where Z is a vector of variables common to all three decisions such as a woman's age, education, race, and residential location, and her nonwage income excluding AFDC and child support. The complete list of variables contained in Z appears in the footnote to Table 6. According to equations (8.1) to (8.3), hours worked also depends upon previous work experience (PREVWORK), child support income and public assistance income. In turn, public assistance income is also a function of the state's income guarantee for the given family size (AFDCMAX), child support and hours worked. Finally, child support income received also depends upon the number of children from the absent father (PATERNITY), whether the child support award was voluntarily agreed to or not (CSVOL), whether the couple is divorced or separated (SEPARATED), the length of time since the marital disruption (TIME and LAW), public assistance income, and hours worked.

PAAMT equals actual AFDC benefits received, not potential benefits at zero hours of work--AFDCEXP or AFDC in our previous tables. For women on welfare who do not work, all three variables should be the same. For women on

welfare who do work, however, PAAMT is less by the value of earnings times the tax rate on earned income. Thus, while PAAMT is clearly affected by HOURS, our theoretical discussion in section II shows that HOURS are affected by AFDCEXP, not PAAMT. This means that the hours regression postulated above is incorrect. However, this specification is used since it simplifies the analysis considerably.

Table 6 presents two sets of estimates of the system of equations in (8) using two-stage least squares (TSLS). The odd number columns exclude the variable CSDUE from the vector Z, while the even number columns include it. That is, while the amount of child support income received is clearly endogenous, whether or not any support is due is assumed to be exogenous. Cols. (1) and (2) report estimates of hours worked which can be compared with the OLS results in Tables 1, 3 and 5 that include an almost identical set of independent variables (the difference being that PAAMT replaces either AFDCEXP or AFDC and PA, as discussed above). Cols. (3) and (4) report estimates of public assistance income received which can be compared with the probit estimates in Table 2 of AFDC participation. Cols. (5) and (6) report estimates of child support income received which can be compared with the probit estimates in Table 4 of whether or not child support is due.

With a few notable exceptions, the results in cols. (3) to (6) are consistent with the earlier probit results. Factors that increase the likelihood of participating in

AFDC or being due child support also increase the amount of such income received. Only one variable--CSDUE--changes sign: according to the probit estimates, women due child support are significantly less likely to be on public assistance, but according to the simultaneous equation estimates these women receive significantly more AFDC income. Notice, however, because of the large negative coefficient on CS in col. (4), women due child support who receive more than $845 in payment (that is, 395.89/468.48) will receive smaller AFDC benefits. One additional result of some note based on the estimates of child support income in cols. (5) and (6): although the estimated coefficients on HOURS and PAAMT are negative, they are not statistically significant. In otherwords, there is at best slight evidence that ex-husbands pay less child support to women who work more or receive higher welfare benefits.

There is a remarkable consistency between the OLS and TSLS coefficients in the HOURS regressions. OTHER INC and ALIMONY significantly reduce hours worked, and their estimated coefficients remain quite stable with changes in econometric technique. In the TSLS estimates the coefficient on PAAMT is large and negative, indicating that a woman on AFDC who receives the average amount of public assistance income ($2514) works 515 to 566 fewer hours per year than an otherwise similar woman who receives no such income. This effect is somewhat smaller than that suggested by the OLS coefficients on PA and AFDC.

It is instructive to compare the various estimates of the coefficients on the two child support variables. In the TSLS the coefficient on CSDUE is larger than its Table 1 or 3 estimates, but smaller than the estimate in Table 5. In col (2) of Table 6, a woman due child support works 220 hours more per year than her otherwise identical counterpart due no support. The most significant difference from previous findings is that the coefficient on CS in col. (2) of Table 6 is no longer positive or statistically insignificant, but negative and significant at a 10 percent level: Each $1000 increase in child support payments received reduces labor supply by 88 hours, or roughly three times as much as OTHER INC. This finding is consistent with the hypothesis that child support income should have a stronger effect than other nonwage income since child support receipts are nontaxable. Finally, taking the coefficients on CSDUE and CS together, a woman due child support who receives the average amount ($1328) works 102 hours more per year than an otherwise identical woman not due child support.

V. Policy Implications

The goal of this paper was to attempt to answer two basic policy questions. First, how will the labor supply of women already due child support (and consequently the economic well-being of their families) change if current efforts to increase their receipt of child support payments succeed? Second, how might the labor supply of women without a child support award change if a support order is obtained on their behalf? We conclude the paper by summarizing our answers to these two questions.

The first question is much easier to answer than the second. According to our estimates, among women due support, a $1000 increase in the amount of child support income received would reduce annual labor supply by as much as 88 hours (Table 6), as little as 4 hours (Table 1), or among women on public assistance, actually increase it by 24 hours (Table 3). We place our greatest confidence in the TSLS estimate in Table 6 since the result is consistent with predictions of economic theory and the estimation technique simultaneously accounts for the endogeneity of public assistance and child support. Thus, we conclude that efforts to increase child support payments will ultimately increase the financial well-being of the woman and her family by less than the amount of child support received since hours worked and consequently earnings will decline.

It is more difficult to predict the labor supply response of women who have no child support award to their

being awarded (and then receiving) child support. If women who are not due child support do not differ in unobservable ways from women who are due child support, then we can use our coefficients on CSDUE and CS to predict their effect on HOURS. Suppose that a woman without a child support award suddenly obtains one and receives $1328 in payment, the average amount received among those due any. We would predict that her annual labor supply increases by anywhere from 102 hours (Table 6) to 192 hours (Table 1).

What if women who are not due child support differ in unobservable ways from women who are due child support? Indeed, in attempting to explain who is due and who is not due child support in Table 4, a large unexplained variation remains: the reported R^2 between observed and predicted values of CSDUE is only .207. Furthermore, based upon an F-test comparing the labor supply of women due child support (Table 5) to the labor supply of women not due child support (results not shown), we can reject the hypothesis of equality of the corresponding coefficients. In other words, the two groups appear to be drawn from different populations. This means that we may not be able to use the experience of the first group (women due child support) to predict the behavior of the second.

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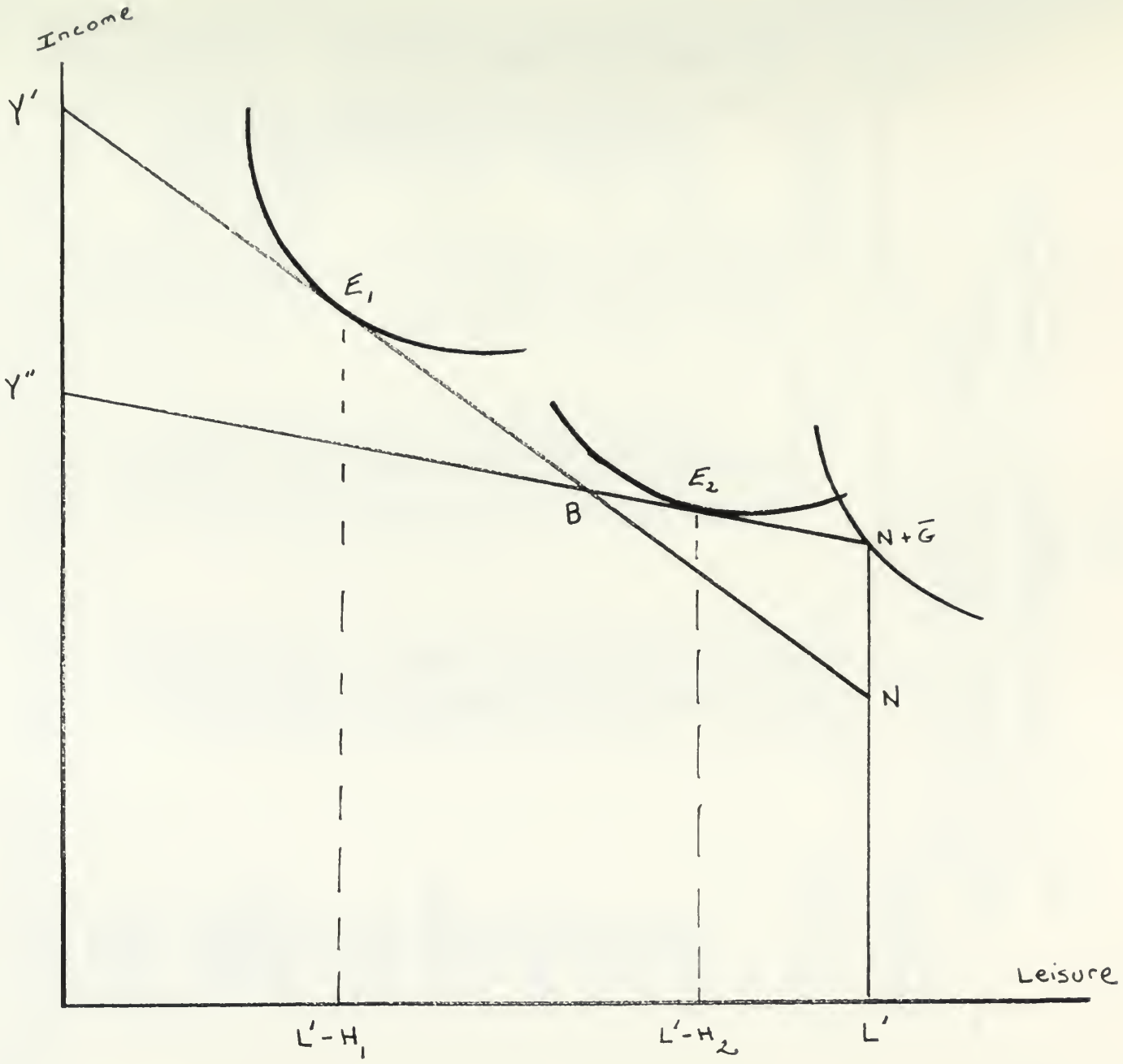

Figure 1

Table 1

OLS Estimates of the Effect of Selected Factors on Hours Worked (with T-Ratios in Parentheses)

Independent Variables	(1)	(2)	(3)	(4)
EDUC	52.17	50.74	78.60	76.75
	(10.25)	(9.98)	(14.07)	(13.76)
AGE	21.25	20.62	29.85	28.77
	(2.47)	(2.40)	(3.11)	(3.01)
AGESQ	-0.34	-0.32	-0.40	-0.38
	(3.19)	(3.05)	(3.43)	(3.24)
KIDS<3	-127.76	-124.03	-167.05	-164.13
	(3.40)	(3.30)	(3.98)	(3.93)
KIDS<6	-51.85	-49.74	-104.31	-100.87
	(1.93)	(1.85)	(3.49)	(3.39)
KIDS<18	-27.03	-29.53	-86.44	-92.29
	(2.20)	(2.40)	(6.25)	(6.68)
BLACK*	-122.77	-100.74	-211.34	-183.51
	(3.76)	(3.07)	(5.84)	(5.04)
PREVWORK*	510.40	504.78	667.43	659.45
	(21.16)	(20.96)	(25.43)	(25.19)
CSDUE*	..	125.60	..	166.32
		(4.70)		(5.51)
PA*	-912.01	-919.36	..	..
	(18.79)	(18.99)		
OTHER INC (/1000)	-24.39	-24.10	-16.36	-15.17
	(6.79)	(6.73)	(4.00)	(3.72)
ALIMONY (/1000)	-63.69	-61.50	-52.17	-47.83
	(5.20)	(5.03)	(3.81)	(3.50)
CS (/1000)	12.05	-3.65	35.45	19.26
	(1.42)	(0.40)	(3.34)	(1.76)
AFDCEXP (/1000)	..	..	-3.63	8.92
			(0.31)	(0.76)
AFDC (/1000)	6.88	12.22	..	..
	(0.47)	(0.83)		
Adj R^2	.451	.454	.320	.325
Sample Size	3827	3827	3827	3827

* Indicates a dummy variable with yes=1 and no=0.
Note: Each regression also includes the variables YEAR82, NCENTR, NEAST, SOUTH, SMSA, CC, AGESQ, SPANISH, NADULT, and SUBFAM. Variable definitions appear in Appendix Table A.

Table 2

Maximum Likelihood Probit Estimates of the Effect of Selected Factors on the Probability of Welfare Participation

Independent Variable	Probit Coefficient	Asymptotic T-Ratios	Partial Derivative**
YEAR82*	.017	0.32	.004
SPANISH*	.026	0.27	.006
BLACK*	.351	5.12	.076
NEAST*	.209	2.90	.045
NCENTR*	.122	1.69	.026
SOUTH*	-.201	2.12	-.044
SMSA*	-.198	3.09	-.043
CC*	.322	4.70	.070
KIDS<3	.037	0.49	.008
KIDS<6	.234	4.24	.051
KIDS<18	.173	6.09	.038
EDUC	-.141	12.15	-.031
NADULT	-.091	2.09	-.020
AGE	-.053	2.83	-.012
AGESQ	.0004	1.73	.00009
AFDCMAX(/1000)	.218	6.91	.047
INCEXCS(/1000)	-.167	6.78	-.036
CS(/1000)	-.096	4.58	-.021
CSDUE*	-.150	2.66	-.033
SUBFAM*	-.473	5.21	-.103
CONSTANT	1.571	4.18	..

* indicates a dummy variable with yes=1 and no=0.
** Probit coefficient times .217 which equals F(BX) where B is the vector of probit coefficients, X is the vector of sample means of the independent variables, and F is the standard normal cumulative distribution function.

Table 3

The Effect of Selected Factors on Hours Worked by Welfare Status (with T-Ratios in Parentheses)

Independent Variables	AFDC Participants (1)	AFDC Participants (2)	Not on AFDC (3)	Not on AFDC (4)
EDUC	40.31	14.21	53.73	69.14
	(4.63)	(0.95)	(8.66)	(9.49)
AGE	-18.84	-30.90	29.47	39.98
	(1.24)	(1.92)	(2.77)	(3.66)
AGESQ	0.13	0.22	-0.42	-0.52
	(0.68)	(1.14)	(3.33)	(4.00)
KIDS<3	-96.54	-93.56	-175.86	-172.28
	(1.94)	(1.88)	(3.30)	(3.24)
KIDS<6	-61.97	-24.93	-69.11	-91.91
	(1.69)	(0.62)	(1.86)	(2.45)
KIDS<18	2.69	41.58	-37.54	-64.20
	(0.13)	(1.55)	(2.42)	(3.82)
BLACK*	-56.11	11.62	-124.39	-168.80
	(1.06)	(0.19)	(3.00)	(3.95)
PREVWORK*	388.61	385.54	536.56	536.56
	(8.82)	(8.76)	(18.75)	(18.80)
CSDUE*	118.91	103.99	132.88	155.26
	(2.80)	(2.43)	(3.95)	(4.57)
OTHER INC (/1000)	-3.35	-5.99	-27.47	-23.42
	(0.36)	(0.64)	(6.94)	(5.75)
ALIMONY (/1000)	151.53	138.59	-61.38	-53.99
	(1.58)	(1.44)	(4.79)	(4.19)
CS (/1000)	24.29	9.99	-14.42	-6.43
	(1.42)	(0.54)	(1.33)	(0.58)
AFDC (/1000)	32.59	61.29	..	..
	(1.87)	(2.80)		
LAMPA	..	316.49	..	-459.49
		(2.16)		(4.00)
Adj R^2	.164	.167	.230	.234
Sample Size	1084	1084	2743	2743

See footnotes to Table 1.

Table 4

Maximum Likelihood Probit Estimates of the Effect of Selected Factors on the Probability That Child Support Is Due

Independent Variable	Probit Coefficient	Asymptotic T-Ratios	Partial Derivative**
YEAR82*	-.132	2.49	-.079
SPANISH*	-.111	1.26	-.067
BLACK*	-.476	7.53	-.286
NEAST*	-.010	0.15	-.006
NCENTR*	.166	2.47	.100
SOUTH*	-.164	1.97	-.099
SMSA*	.132	2.34	.079
CC*	-.157	2.59	-.094
KIDS<3	-.035	0.48	-.021
KIDS<6	-.066	1.27	-.040
KIDS<18	.097	3.40	.058
EDUC	.056	5.73	.034
NADULT	-.079	1.72	-.047
AGE	.026	1.56	.016
AGESQ	-.0004	2.00	-.0002
SUBFAM*	-.161	1.97	-.097
ALIMONY(/1000)	.110	3.54	.066
OTHER INC(/1000)	.004	0.60	.002
AFDCMAX(/1000)	-.077	2.58	-.046
PREVWORK*	.094	2.03	.056
PATERNITY	.077	2.42	.046
SEPARATED*	-.792	15.77	-.476
TIME	.051	6.10	.031
LAW	-.061	3.62	-.037
CONSTANT	-.970	2.68	..

* indicates a dummy variable with yes=1 and no=0.
** Probit coefficient times .601. See notes to Table 2.

Table 5

Estimates of the Effect of Selected Factors on Hours Worked For All Women and Women Due Child Support (with T-Ratios in Parentheses)

Independent Variables	All Women (1)	All Women (2)	Women Due Child Support (3)	Women Due Child Support (4)
EDUC	41.76	64.79	54.94	44.99
	(7.71)	(10.88)	(7.90)	(6.06)
AGE	16.55	24.11	16.40	8.99
	(1.92)	(2.54)	(1.32)	(0.72)
AGESQ	-0.25	-0.30	-0.23	-0.11
	(2.39)	(2.52)	(1.46)	(0.69)
KIDS<3	-108.03	-146.10	-182.23	-168.56
	(2.87)	(3.50)	(3.52)	(3.26)
KIDS<6	-38.05	-84.03	-22.58	-7.54
	(1.42)	(2.82)	(0.63)	(0.21)
KIDS<18	-40.93	-109.08	-20.32	-32.52
	(3.28)	(7.73)	(1.20)	(1.89)
BLACK*	-11.82	-66.12	-190.61	-86.14
	(0.31)	(1.58)	(3.98)	(1.56)
PREVWORK*	485.46	634.69	460.58	438.31
	(19.92)	(23.97)	(14.97)	(14.03)
CSDUE*	488.23	652.09	..	..
	(5.98)	(7.12)		
PA*	-917.10	..	-921.67	-917.84
	(18.99)		(14.41)	(14.39)
OTHER INC (/1000)	-24.46	-14.98	-24.25	-24.60
	(6.85)	(3.70)	(5.22)	(5.31)
ALIMONY (/1000)	-73.04	-62.02	-64.74	-76.13
	(5.87)	(4.48)	(4.83)	(5.56)
CS (/1000)	-2.82	23.58	-4.80	-4.41
	(0.31)	(2.15)	(0.51)	(0.47)
AFDCEXP (/1000)	..	17.86	..	..
		(1.50)		
AFDC (/1000)	13.52	..	23.97	27.10
	(0.92)		(1.12)	(1.27)
LAMCS	-237.80	-315.58	..	-280.36
	(4.70)	(5.60)		(3.76)
Adj R^2	.457	.330	.411	.415
Sample Size	3827	3827	2266	2266

See footnotes to Table 1.

Table 6

Two-Stage Least Squares Estimates of Hours Worked, AFDC Income, and Child Support Payments (with T-Ratios in Parentheses)

Independent Variables	HOURS (1)	HOURS (2)	PAAMT (3)	PAAMT (4)	CS (5)	CS (6)
OTHER INC	-23.15	-21.41	-36.81	-34.73	12.09	12.23
(/1000)	(6.00)	(5.53)	(6.74)	(5.85)	(1.48)	(1.58)
ALIMONY	-81.10	-27.49	3.17	66.07	313.13	300.11
(/1000)	(4.85)	(1.40)	(0.13)	(2.12)	(12.68)	(12.92)
CSDUE	..	219.59	..	395.89	..	1059.30
		(3.77)		(4.21)		(21.20)
HOURS	..	..	-58.52	-63.55	-13.85	-14.06
(/100)			(11.18)	(11.00)	(1.27)	(1.37)
PAAMT	-204.65	-225.02	..	..	-86.29	-41.67
(/1000)	(4.58)	(5.05)			(0.80)	(0.41)
CS	77.82	-88.29	-259.75	-468.48	..	..
(/1000)	(2.31)	(1.84)	(5.74)	(6.46)		
PREVWORK	570.92	550.92	..	..	..	..
	(17.92)	(17.14)				
AFDCMAX	..		257.09	264.96	..	..
(/1000)			(11.32)	(10.71)		
PATERNITY	..		..	..	206.54	188.58
					(6.93)	(6.71)
CSVOL	..		..	..	747.75	461.01
					(13.60)	(8.82)
SEPARATED	..		..	..	-210.21	74.80
					(3.95)	(1.44)
TIME	..	..	..	..	30.69	16.10
					(3.82)	(2.13)
LAW	..	..	..	..	-21.41	3.53
					(1.28)	(0.22)

Note: Each regression also includes the variables YEAR82, SPANISH, BLACK, NEAST, NCENTR, SOUTH, SMSA, CC, KIDS<3, KIDS<6, KIDS<18, EDUC, SUBFAM, NADULT, AGE, and AGESQ.

Appendix Table A

Definition of Variables

EDUC = number of years of school completed by the women.

SPANISH = 1 if woman is of Spanish origin and 0 otherwise.

BLACK = 1 if the woman is Black and 0 otherwise.

NEAST = 1 if woman lives in the northeast and 0 otherwise.

NCENTR = 1 if woman lives in the northcentral states and 0 otherwise.

SOUTH = 1 if woman lives in the south and 0 otherwise.

SMSA = 1 if woman lives in an SMSA and 0 otherwise.

CC = 1 if woman lives in the central city of an SMSA and 0 otherwise.

PATERNITY = number of children under 21 fathered or adopted by ex-husband living with their mother.

AGE = woman's current age.

AGESQ = age squared

CSVOL = 1 if child support was awarded voluntarily and 0 otherwise.

YEAR82 = 1 if observation is from the 1982 Match File and 0 if from the 1979 Match File.

SEPARATED = 1 if woman is currently separated and 0 if she is divorced

TIME = last two digits of divorce or separation year minus 60, or 0 if marital disruption occurred before 1961.

LAW = last two digits of divorce or separation year minus 74, or 0 if marital disruption is before 1975.

KIDS<i = number of children less than i years old (i=3,6,18).

PREVWORK = 1 if woman was working in 1975 (1979 Match File) or if woman was working at the time of her marital disruption (1982 Match File); else 0.

PA = 1 if AFDC income was received and 0 otherwise.

CSDUE = 1 if child support is due and 0 otherwise.

SUBFAM = 1 if woman and her children live as a subfamily and 0 otherwise.

NADULT = number of adults in the household in which the woman and her children reside.

HOURS = annual hours worked in 1978 or 1981

LAMPA = correction for public assistance sample selection bias. See equation (6) in the text.

LAMCS = correction for child support sample selection bias. See equation (7) in the text.

INLFNOW = 1 if the woman was in the labor force during the March survey week and 0 otherwise.

[Note: the following variables are measured in 1978 dollars by deflating the 1981 values by 1.40]

OTHER INC = total family income in year prior to the survey excluding a woman's own earnings, AFDC income, child support and alimony.

CS = child support income received in year prior to survey.

ALIMONY = alimony income received in year prior to survey.

PAAMT = AFDC income received in year prior to survey.

INCEXCS = total personal income in year prior to survey excluding earnings, AFDC income and child support.

AFDCMAX = maximum AFDC benefits paid by the state, adjusted for family size. See appendix C.

AFDCEXP = expected AFDC benefits at zero hours of work. See appendix C.

AFDC = AFDC * PA

Appendix Table B

Means (and Standard Deviations) of Selected Variables

Variable	Full Sample (N=3827)	Non AFDC Women (N=2743)	AFDC-Women (N=1084)	Women Due Child Support (N=2266)
YEAR82	.55	.57	.50	.55
	(.50)	(.49)	(.50)	(.50)
SPANISH	.08	.06	.12	.06
	(.27)	(.24)	(.33)	(.24)
BLACK	.21	.17	.31	.13
	(.41)	(.38)	(.46)	(.34)
NEAST	.21	.19	.28	.20
	(.41)	(.39)	(.45)	(.40)
NCENTR	.23	.22	.26	.27
	(.42)	(.42)	(.44)	(.44)
SOUTH	.31	.34	.21	.27
	(.46)	(.47)	(.41)	(.44)
SMSA	.61	.60	.63	.59
	(.49)	(.49)	(.48)	(.49)
CC	.32	.28	.42	.26
	(.47)	(.45)	(.49)	(.44)
KIDS<3	.17	.11	.30	.14
	(.42)	(.34)	(.56)	(.39)
KIDS<6	.42	.31	.71	.39
	(.68)	(.56)	(.86)	(.65)
KIDS<18	1.72	1.51	2.24	1.74
	(1.13)	(1.03)	(1.22)	(1.03)
EDUC	11.87	12.30	10.77	12.29
	(2.53)	(2.44)	(2.42)	(2.34)
NADULT	1.37	1.41	1.27	1 32
	(.71)	(.74)	(.64)	(.66)
AGE	35.80	36.89	33.05	35.37
	(9.28)	(9.32)	(8.60)	(8.36)
AGESQ	1367.61	1447.29	1165.98	1320.69
	(731.04)	(749.17)	(640.47)	(640.98)
CS	786.61	937.62	404.50	1328.49
	(1484.46)	(1529.93)	(1286.38)	(1732.67)
SUBFAM	.08	.09	.07	.07
	(.28)	(.29)	(.25)	(.26)
CSDUE	.59	.64	.48	
	(.49)	(.48)	(.50)	
ALIMONY	159.11	213.76	20.82	228.22
	(970.04)	(1133.95)	(205.01)	(1149.91)
OTHER INC	2044.70	2438.38	1048.54	1964.76
	(4064.80)	(4416.70)	(2755.98)	(4017.94)
PREVWORK	.50	.59	.28	.54
	(.50)	(.49)	(.45)	(.50)

Appendix Table B (continued)

Variable	Full Sample (N=3827)	Non-AFDC Women (N=2743)	AFDC-Women (N=1084)	Women Due Child Support (N=2266)
AFDC	818.94	0	2891.20	577.00
	(1548.40)	(0)	(1572.62)	(1290.59)
AFDCEXP	1945.08			
	(1572.31)			
PA	.28			.23
	(.45)			(.42)
HOURS	1262.33	1594.13	422.74	1415.61
	(943.53)	(818.00)	(683.02)	(902.06)
AFDCMAX	3005.7			
	(1294.5)			
INCEXCS	822.20			
	(2302.50)			
PATERNITY	1.86			
	(.94)			
SEPARATED	.33			
	(.47)			
TIME	15.46			
	(5.11)			
LAW	2.94			
	(2.65)			
LAMCS	.00			.54
				(.30)
LAMPA		—.31	.88	
		(.22)	(.48)	
INLFNOW	.74	.87	.41	
	(.44)	(.34)	(.49)	
CSVOL	.24			
	(.18)			
PAAMT	704.13			
	(1373.79)			

Appendix C

Description of the AFDC Variables Used in the Analysis

The variables AFDCMAX and PAYSTD for 1978 were obtained from U. S. Department of Health, Education and Welfare (1979), Tables 6 to 10. AFDCMAX equals the monthly amount of the largest payment for AFDC (times 12) by number of recipients and state. The number of recipients is determined by adding one adult plus the number of children under the age of 20. PAYSTD equals the monthly amount of the payment standard (times 12) by number of recipients and state. For 1981 AFDCMAX and PAYSTD were obtained from U. S. Department of Health and Human Service (1981), Tables 17 and 18.

The following procedure was used to create AFDCEXP, potential AFDC benefits at zero hours of work:

Let AFDCPOT = (PAYSTD -(INCEXCS + CS))

If AFDCPOT < 0, then AFDCPOT = 0

IF AFDCPOT < AFDCMAX, then AFDCEXP = AFDCPOT

IF AFDCPOT > AFDCMAX, then AFDCEXP = AFDCMAX

where INCEXCS equals total personal income excluding personal earnings, public assistance income received, and child support received. CS equals child support received.

PAAMT equals actual public assistance income received. If PAAMT exceeds zero, then PA equals 1. If PAAMT equals zero, then PA equals zero.

Finally, AFDC = AFDCEXP*PA. In otherwords, AFDC equals potential AFDC benefits at zero hours of work for those who receive some public assistance income.

All 1981 figures were deflated by 1.40.