Federal Reserve Bank of Minneapolis Quarterly Review
Vol. 19, No. 2, Spring 1995, pp. 2–28

A New Idea for Welfare Reform

Michael P. Keane
Visitor
Research Department
Federal Reserve Bank of Minneapolis
and Associate Professor of Economics and Industrial Relations
University of Minnesota

Abstract
This article analyzes several proposals to build work incentives into the U.S. welfare system. It concludes that the most cost effective way to do that is to offer a work subsidy to all low-income single parents—in other words, to simply pay them for working in the labor market. This conclusion is based on a model of the labor force participation behavior of low-income single mothers that the author developed with Robert Moffitt. Among the proposals evaluated in the article, besides the work subsidy, are proposals to reduce the rate that welfare benefits are reduced when welfare recipients work, to provide wage subsidies to low-wage workers, to expand the earned income tax credit, and to subsidize the fixed costs of working.

The views expressed herein are those of the author and not necessarily those of the Federal Reserve Bank of Minneapolis or the Federal Reserve System.

Welfare reform is now a top priority on the U.S. agenda.[1] A broad consensus has emerged that the current welfare system discourages the very type of behavior it should encourage: the system discourages people who participate in welfare programs from making efforts to find jobs that will also provide income for themselves and their families. The U.S. public wants the system modified in order to get large numbers of welfare recipients completely off the welfare rolls and into the labor market. But what is the most cost effective way to do that?

To be able to build effective work incentives into the current welfare system, we must understand how that system discourages work. Consider Aid to Families with Dependent Children (AFDC), the program that provides income support for single parents—primarily mothers—and their children. If a single mother does not work outside the home, then the AFDC program provides a basic level of income support, one well below the poverty line. But if a single mother receiving AFDC benefits gets a job, then everything she earns (beyond her child care and other work-related expenses) is deducted from those benefits, dollar-for-dollar. Given this, we should not be surprised that only 6 percent of AFDC mothers work.

In this article, I examine several proposals for building work incentives into the AFDC system. I conclude that the most cost effective way to achieve this objective is a new proposal: a work subsidy targeted at all low-income single mothers. The results presented here come from a model of the labor force participation behavior of low-income single mothers that I developed with Robert Moffitt (Keane and Moffitt 1995). Using this model, I show here that a work subsidy can substantially increase the number of single mothers who work, reduce their reliance on welfare, and save the government money while at the same time actually making single mothers better off.

The idea of the work subsidy is, simply, to pay single parents for working outside the home. The plan would provide a weekly earnings subsidy to any single mother who works at least 20 hours per week, regardless of whether or not she is on welfare. The subsidy would save the government money when it induced single mothers to work and get off welfare, provided the size of the subsidy was less than the benefits paid to nonworking mothers. The subsidy would cost the government money when it was paid to mothers who would have worked anyway. My results indicate that the subsidy can be designed so that it is *revenue neutral*—that is, so that the savings roughly offset the costs.

My results also indicate that, in terms of cost effectiveness, the work subsidy idea dominates other ways proposed to build work incentives into the AFDC system. These include reducing the rate at which welfare benefits are taken away when a recipient chooses to work, providing wage subsidies for low-wage workers, and expanding the earned income tax credit.

That last suggestion is of particular interest. The Clinton administration's welfare reform proposal—the Work and Responsibility Act of 1994—adopts an expanded earned income tax credit as the main method to build work incentives into the welfare system, and such an expansion is already being implemented over the 1994–96 period, as laid out in the Omnibus Budget Reconciliation Act of 1993. My model predicts that expansion of the earned income tax credit along the lines planned in that act will increase labor force participation of single mothers, but that it will also dramatically increase government costs. A work subsidy can achieve the same increase in participation at a small fraction of the cost.

The work subsidy idea I propose here is similar in spirit to some recent proposals to subsidize the fixed costs of working (costs like child care expenses and the loss of Medicaid coverage). That sort of subsidy may also be a cost effective way to increase market work effort. But a work subsidy has significant advantages over a fixed costs subsidy. Most important, a work subsidy is much more flexible, so it can be designed to lead to much larger increases in market work effort than would result from a subsidy tied to the fixed costs of working.

The Current Debate

In order to understand the issues involved in welfare reform, we will find it useful to understand something about the history of welfare and welfare reform in America.

Historically, *welfare reform* has usually meant changing the AFDC program, because that program is what most people have in mind when they say *welfare.* The AFDC program was created in 1935 as part of the Social Security Act. At that time, single mothers were usually widows, and the common view was that widows should be able to stay home and take care of their children rather than being forced to leave the home and enter the labor market.

Since 1935, some fundamental changes in American society have changed the nature of the AFDC caseload. Divorce, separation, and births to unmarried women have become more common, so the majority of AFDC recipients no longer are widows. Rather, the majority of these recipients today are women who are divorced or separated or who were never married. Since 1935, mothers working outside the home has also become much more common and acceptable.

The change in the composition of the AFDC caseload, combined with the changed attitude toward mothers working, has changed the public perception of the AFDC program. Today, many people see this program as allowing unwed mothers to avoid work in a world where women are expected to work. Furthermore, many even believe that young unwed women living in ghetto areas have babies so that they can become eligible for AFDC benefits and avoid entering the labor force. Some people go so far as to blame the AFDC program itself for the changes in American society since 1935 that they see as a *disintegration of the family.* As a result of these perceptions, recent polls of the U.S. public indicate that the AFDC program is one of the most unpopular of the federal government programs.[2]

Because social conservatives have adopted the view that the AFDC program causes family disintegration, the current welfare reform debate has focused primarily on changing this program in order to end its presumed role in encouraging divorce, separation, and out-of-wedlock births. The problem of the work disincentive effects of the program has assumed a secondary role.

This emphasis is misguided. The dramatic claims that the AFDC program is causing family disintegration are rather simple to discount. Contrary to widespread public perceptions, there is no empirical evidence that this program causes any of the social changes attributed to it. (See

Ellwood and Bane 1985, Jencks 1992, Moffitt 1992.) AFDC benefits vary dramatically both across states and over time. If high benefits caused family disintegration, we would expect to see higher levels of divorce, separation, and out-of-wedlock births in states and time periods when benefits were higher. But instead we see essentially no correlation, either across states or over time, between the levels of benefits and the levels of divorce, separation, and out-of-wedlock births.[3]

The criticism of the AFDC program that cannot be discounted is that it discourages work in the labor market. Surveys by Danziger, Haveman, and Plotnick (1981) and Moffitt (1992) suggest that the reduction in work hours by single mothers induced by the welfare system is around 30 percent. Therefore, I argue that welfare reform should concentrate on the work incentive effects of welfare programs, rather than being distracted by discussions of any role of welfare in generating divorce, separation, and out-of-wedlock births.

Historically, even when the work disincentive effects of the welfare system were the focus of attention, welfare reform proposals have not focused exclusively, or even primarily, on incentives as a means of inducing welfare recipients to increase their efforts to work in the market. For example, the centerpiece of the last major welfare reform measure, the Family Support Act of 1988, was the Job Opportunities and Basic Skills Training Program, a job training program. Also, although the current Clinton administration proposal calls for expansion of the earned income tax credit, it does not rely solely on tax incentives to induce welfare recipients to work. It also includes a component of job training and job search assistance. Further, it includes a form of negative incentive, or penalty, that would encourage work: a two-year time limit on collecting welfare benefits; after that point, a welfare recipient must start to work. But for those who cannot find work, the Clinton plan calls for guaranteed public jobs.

The training and time limit components of the Clinton plan are likely to be expensive. The notion that a few months of inexpensive job training or job search assistance could get sizable numbers of people off welfare is illusory. Existing studies of the effects of training and job search assistance indicate that inexpensive programs lead to small gains in earnings and employment (Burtless 1989). Studies estimate that a full year of college raises a person's annual earnings only about 7 or 8 percent (Weiss 1986, Willis 1986); thus it would be surprising if an inexpensive job training program could raise the earning capacity of welfare recipients sufficiently to eliminate their dependence on welfare. Turning to the time limit proposal, note that public works jobs are very expensive to create. Haveman (1980) estimates that creation of each such jobs would cost $15,000 per year (in 1994 dollars).

A key difference between the Clinton proposal and the welfare legislation recently passed by the House Republicans—the Personal Responsibility Act of 1995—is that the Republican plan relies on penalties for failure to find market work, as opposed to positive work incentives, as the main way to encourage work. In particular, while both the Clinton proposal and the House bill include two-year time limits on receipt of AFDC benefits, the House bill does not include guaranteed public jobs for single mothers who fail to find work in two years.[4]

The time limit component of the House legislation would certainly force single mothers off the AFDC rolls, and the threat of lost benefits after two years might well induce them to search harder for jobs. But many single mothers receiving AFDC benefits are poorly educated and have access only to low-wage jobs. Hence, many cannot support a family by market work alone. Also, the House legislation begs the question of who will care for the 9.5 million children of the 4.5 million single mothers who currently receive AFDC benefits if these mothers fail to find adequate jobs in two years. Society is unlikely to tolerate a situation in which such children are not supported.

In this context, we should remember that the most cost effective way for society to guarantee support for the children of single mothers is to simply transfer income to the mothers. Contrary to a popular myth, the AFDC program represents a rather small share of the federal budget. In 1992 it cost only $20.4 billion, which was 0.33 percent of the gross domestic product that year, yet the program provided support for roughly 9.5 million children of single mothers—a cost of only about $2,250 per year per child supported. Alternative means of support, like orphanages or publicly run foster care, would be vastly more expensive. The U.S. Department of Health and Human Services estimates that supporting children in orphanages would cost $36,500 per child annually, while providing foster care would cost $4,800 annually (Sample 1994).

Another idea for welfare reform included in the Clinton plan is to place more of the burden of child support on absent fathers and less on the government. This could be done by setting national standards for child support awards and providing better enforcement of awards. [A strong advocate of this idea is Ellwood (1988, p. 163).] Unfortunately, most absent fathers of children in households headed by poor single mothers are themselves poor. Thus improved child support may only put a small dent in the problem of providing support for children in female-headed households (Meyer 1993).

The real challenge of welfare reform is to increase work effort by welfare recipients and reduce welfare caseloads without simultaneously increasing program costs or hurting single mothers and their children. In light of the above discussion, I argue that the best way to achieve the goals of welfare reform is through positive work incentives, rather than through other options like time limits, job training, work requirements, publicly created jobs, or child support assurance. Within the realm of work incentives, I will attempt to show that the key proposals that are currently either being considered or being implemented, such as benefit tax rate reductions, wage subsidies, or earned income tax credit expansions, do not accomplish these goals. But according to my analysis, a work subsidy can substantially increase work effort by welfare recipients and reduce welfare caseloads without simultaneously increasing program costs or hurting single mothers and their children.

Some Survey Data

In order to examine the market work and welfare program participation behavior of low-income single mothers, I will examine data from the Survey of Income and Program Participation (the fourth wave of the first panel), which was administered by the U.S. Department of Commerce in the fall of 1984. These are the same data Moffitt

and I (1995) used in our study of the behavior of single mothers. This survey covers a nationally representative sample of the U.S. population, approximately 20,000 households, and is especially designed to elicit information on income and participation in various transfer programs, including the four I am most interested in here: the AFDC, food stamp, public housing, and Medicaid programs.

From the survey results, I select data for all female heads of household aged 18–64 with children under the age of 18. The survey data include 1,148 such women. In order to look specifically at the behavior of low-income single mothers, I invoke four screens on this sample. First, I exclude families with asset levels over $4,500. Such families are far above the AFDC and food stamp program asset limits. Second, I exclude women with hourly wage rates over $15. Third, I exclude women with nonlabor income more than double the food stamp program's nonlabor income screen ($728 per month for a family of two, with an extra $189 for each additional family member). Fourth, I exclude self-employed women and those for whom data are missing for key variables used in the analysis. The remaining sample consists of 968 women.

The variables used in the analysis are defined as of the month before the individuals were interviewed for the survey. Participation in the AFDC, food stamp, and public housing programs is defined with regard to whether any participation took place in the month. Work status is defined as the average weekly hours of market work in the month, with 1–35 hours defined as *part-time* and more than that defined as *full-time*. Hourly wage rates for those who work are computed from earnings and hours of work in the month before the survey and are used to compute weekly earnings from part-time and full-time work. Nontransfer nonlabor income is computed as the sum of asset income and the income of others in the family. Variables are also constructed for a set of socioeconomic characteristics, including education, age, number of children, regional location, race, residence in a standard metropolitan statistical area, and various state characteristics. The sample means of the variables are shown in Table 1.

Some of the statistics in Table 1 contradict popular notions about low-income single mothers. For example, the typical low-income single mother is thought to be black and very young and to live in a big northern city. In the sample, however, 61 percent of the women are white, the average age is 34 years, 41 percent do not live in a large metropolitan area, and 35 percent live in a southern state. The typical low-income single mother is also thought to be an unwed mother. In the sample, however, the large majority of women were once married and have become single, primarily through divorce (43.4 percent) or separation (22.3 percent). Only about a quarter of the sample were never married. More accurate is the popular notion that the typical low-income single mother is poorly educated. In the sample, the average number of years of education is 11.48, not quite a high school degree. However, for the average to be this high, many women in the sample must have a high school degree. Contrary to popular notions, therefore, a more accurate description of a typical low-income single mother would seem to be a white woman in her thirties without a college degree who is divorced or separated.

Table 1 also shows that the average number of children under 18 among women in the sample is 2.06, and the average nonlabor income is only $4.36 per week. Since 65.7 percent of the sample are divorced or separated, this indicates that alimony and child support payments are typically small.

A striking feature of the data is that the mean hourly wage rate in this population is only $5.20 in 1984 dollars.[5] In 1993 dollars, this translates into $7.23 per hour.[6] For someone working 2,000 hours per year, this would translate into an annual income of $14,460 in 1993 dollars. Given that the 1993 after-tax poverty lines for families of three and four are $11,513 and $14,757, respectively, many of the women in the sample would obviously have trouble supporting families by market work alone (U.S. Bureau of the Census 1994).

Table 2 shows the distribution of the sample across the work and welfare program participation categories. The first row of the table indicates that 516 single mothers (53 percent) participate in no transfer programs. Of these, 440 (85 percent) work in the market at least part-time.[7] The pattern is very different for welfare program participants. Note, for example, that 175 single mothers (18 percent) participate in both the AFDC and food stamp programs, but not in public housing. Among these women, only 7 percent work at least part-time. The pattern is even more striking for those who participate in all three programs. Of these 80 single mothers (8 percent of the sample), only 4 percent work.

Thus we see a striking fact about the population of low-income single mothers: at a point in time (the month for which the survey was taken), of those who are on welfare, few work; and of those who are not on welfare, almost all work. As we will see in the next section, this is exactly the pattern we would expect the current welfare system to generate, given rational economic decision making by single mothers.

The Welfare Benefit Rules

To understand why working and participating in the current welfare programs at the same time is almost never optimal, we will find it useful to look at the type of budget constraints that these welfare programs create. I will describe those constraints under the 1984 welfare benefit rules, the rules in effect when the transfer program survey was taken. The current welfare rules are similar in structure to those in effect in 1984. The only major difference is that AFDC grant levels have not kept pace with inflation since 1984. The U.S. welfare benefit rules are quite complex, so I will only describe their overall structure here. Some details are provided in Appendix A.

The Major Programs

The AFDC rules specify a monthly grant amount for a woman with no income. That amount is state-specific and varies tremendously across states. If a woman works in the market, the AFDC grant is reduced essentially dollar-for-dollar for all income in excess of child care and other work-related expenses. Thus the AFDC program imposes a 100 percent tax rate on earnings. AFDC recipients also receive free medical insurance through the Medicaid program.

The food stamp rules are similar in structure to those for the AFDC program. The major differences are that the

food stamp grant amount is uniform nationally, its tax rate is only 30 percent rather than 100 percent, and the food stamp program treats AFDC benefits as taxable income.

Public housing can take the form of a unit in a housing project built and owned by the government or a voucher for rent in a privately owned housing unit (as described in Section 8 of the U.S. Housing Act of 1937). Basically, the public housing rules specify that a single mother need spend on rent only 30 percent of her net income (including AFDC benefits but with deductions based on the number of children). Any cost beyond that is paid by the program. Unlike the AFDC and food stamp programs, public housing is not an entitlement for women who are eligible based on meeting the income screen. Not all eligible single mothers can get into public housing because space is rationed. Furthermore, as Jencks and Edin (1990) point out, many single mothers say that even if they could move into public housing, they would not, because of the danger involved. Urban public housing projects typically have high incidence of crime, while Section 8 housing tends to be located in high crime areas.[8]

Examples

Table 3 provides some examples of how the welfare benefit rules work. Consider a woman with a wage rate of $5.20 per hour (the mean wage rate in the sample) who has two children under 18 years old. Suppose this woman is facing the choice of working 0, 20, or 40 hours in a week. Table 3 calculates what her net income would be at each hours level under two scenarios: when she participates in all three major welfare programs (when eligible) and when she participates in only the AFDC and food stamp programs, not public housing. These calculations include federal taxes, Social Security taxes, and work expenses, but ignore state taxes. (See Appendix A.) Child care expenses are also ignored. Calculations are reported for three representative states: Minnesota, which among all U.S. states has a relatively high level of benefits; Kansas, which has an average level of benefits; and Alabama, which has relatively low benefits.

□ *Minnesota*

Consider first Minnesota. If a single mother of two in Minnesota doesn't work in the market, she can get $117 per week in AFDC benefits and $19 in food stamps. She also qualifies for a $97 rent subsidy if she can get into public housing.[9] Then, since she has no taxes or work expenses, her net weekly income will be $233. That's $12,116 per year, or $16,853 in 1993 dollars.

Now consider what would happen if this woman in Minnesota decides to work in the market. If she works 20 hours per week, she earns $104, but her AFDC benefit is reduced by $92, her housing benefit is reduced by $6, and she faces $29 in taxes and work expenses (excluding child care). Thus working part-time will actually reduce her weekly net income from $233 to $210. Next suppose she works 40 hours per week. Now she earns $208, but her AFDC and food stamp benefits are eliminated, and her housing benefits fall $27. Furthermore, she has to face $47 in taxes and work expenses. This leaves her with $225 in net income, which is less than if she didn't work at all. Thus the effective tax rate on labor income in moving from 0 to 40 hours exceeds 100 percent.

Consider next the income of this same single mother living in Minnesota if she does not receive public housing benefits. If she doesn't work in the market, her net weekly income from the AFDC and food stamp programs is $136. That's $7,280 per year, or $10,126 in 1993 dollars. This compares to the poverty line for a family of three of $11,513. Obviously, if a single mother is rationed out of public housing or refuses to live in it, then welfare benefits alone will not bring her up to the poverty line, even in a high-benefit state like Minnesota.

If this single mother works part-time in the market, her net weekly income falls from $136 to $119, while if she works full-time, her weekly income rises from $136 to $161. Thus, for a woman not receiving housing benefits, the effective tax rate on labor income in moving from 0 to 40 hours is 88 percent. Looked at another way, since working a 40-hour week raises the woman's net earnings $25, her after-tax average wage rate is only 63 cents per hour. Furthermore, the figures understate the true costs of working. Since the single mother considered here loses all AFDC benefits when she works 40 hours per week, she loses Medicaid eligibility as well. Also ignored here are the child care costs that may arise if she works.

These calculations clearly illustrate why market work is unlikely to be a preferred option for a single mother with two children and a wage rate near $5.20 in Minnesota. Her distaste for collecting welfare benefits would have to be great indeed to make her prefer working 40 hours per week to earn $161 when she could get $136 from the AFDC and food stamp programs if she doesn't work—especially when working would cause her to lose the medical coverage for herself and her children provided by Medicaid and require her to purchase child care. In order to make market work a preferred option, a typical single mother with two children would need a wage rate well above $5.20 per hour. As the wage rate rises, the net income gains a woman can obtain by moving from 0 to 20 to 40 hours naturally rise, making work more attractive.

□ *The Typical Decision Problem*

Chart 1 illustrates the labor supply decision problem faced by a typical single mother. Income is plotted on the vertical axis, and hours of market work are plotted on the horizontal axis. Note that as one moves from right to left along the horizontal axis, hours of work increase.[10]

The budget constraint *ABC* is representative of the type of constraint faced by a single mother of two in Minnesota with a market wage rate of $5.20 who participates (when eligible) in the AFDC and food stamp programs. The segment *AB* (representing income for work between 0 and 20 hours) is flatter than the segment *BC* (for work between 20 and 40 hours) because the average tax rate on labor earnings is greater for part-time work than for full-time work. In fact, segment *AB* is drawn so that it slopes down as it moves to the left, because for most single mothers, income will actually decline if they shift from nonwork to part-time work.

The indifference curve in Chart 1 connects different combinations of income and hours that give the woman equal utility (or satisfaction). As I've drawn this curve, the point at which the woman's satisfaction can be maximized, given her budget constraint *ABC*, is where these two curves meet—at the point *A*. In other words, the wom-

an facing constraint *ABC* will maximize utility by choosing not to work.

Now consider an increase in the woman's wage rate. As the wage rate rises, the budget constraint shifts upward. At a sufficiently high wage rate, constraint *AB′C′* is obtained. With this new constraint, the woman is indifferent between not working at all and working full-time; she will receive the same level of satisfaction from both. Call the wage rate that generates constraint *AB′C′* the *reservation wage* w^R. If the woman was originally in a situation in which she could only get $5.20 per hour jobs and was then offered a job with a wage rate above w^R, she would suddenly shift from not working at all to working full-time. Also, since AFDC and food stamp benefits go to zero with full-time work (Table 3), she would cease participating in both welfare programs.

We see that, given the type of constraints created by the welfare system, a woman would have a decision rule that says to work full-time in the market (driving welfare benefits to zero) if the wage is above some reservation level and to not work at all (and collect full welfare benefits) if the wage is below that level. This is exactly the type of behavior we have seen in Table 2: For the most part, women either work full-time and collect no benefits or do not work at all while collecting both AFDC and food stamp benefits (perhaps along with public housing). Working part-time is rare, and so is working while collecting benefits. Given the type of constraints the welfare system creates, it is rational economic behavior to not work if one is collecting AFDC benefits.

□ *Kansas*

Although AFDC grant levels are much higher in Minnesota than in most other states, the type of budget constraints created by the welfare system are nevertheless similar in other states. Consider the budget calculations for Kansas, a state that is average in terms of the AFDC grant level. If the single mother in the Minnesota example lived instead in Kansas and participated in the AFDC and food stamp programs when she was eligible, her net income levels at 0, 20, and 40 hours of market work would be $114, $106, and $161, respectively. Again, the effective tax rate on earnings is over 100 percent in moving from 0 to 20 hours and 77 percent in moving from 0 to 40 hours.

Note also that the $114 weekly benefit level at zero hours of market work in Kansas translates into an annual income level of $5,928, which is $8,246 in 1993 dollars. Since the 1993 poverty line was $11,513, the combination of AFDC and food stamp benefits does not bring a single mother close to the poverty line in a typical state if she does not work.

□ *Alabama*

An example of a state at the low end of the AFDC benefit scale is Alabama. There the weekly AFDC benefit of a single mother of two who doesn't work in the market is only $23, and together AFDC and food stamp benefits provide $71 in net weekly income. This translates into an annual income of $3,692, which is only $5,136 in 1993 dollars. If this woman works 20 or 40 hours per week, her net income increases to $106 or $161, respectively. The case of Alabama illustrates that with a sufficient cut in the AFDC grant level, the effective tax rate of earnings for part-time work falls below 100 percent. However, the average tax rate on earnings is still 66 percent in moving from 0 to 20 hours and 57 percent in moving from 0 to 40 hours. Since working 40 hours only increases net earnings from $71 to $161, the after-tax average wage rate is still only $2.25 per hour.

The Sample Averages

A final way to look at the welfare benefit rules is to return to the survey data and look at average earnings and benefits across all sample members in all states. This I do in Table 4. For example, the table indicates that the mean weekly AFDC benefit for a member of the sample drops from $63.53 at zero hours to $13.74 at 20 hours to $2.20 at 40 hours. For the average member of the sample, going from nonwork to working full-time in the market would generate $208 in labor income each week, while causing her to lose roughly $61 in AFDC benefits, $26 in food stamp benefits, and $38 in housing benefits. Furthermore, she would incur $24 in federal income and Social Security taxes and lose eligibility for Medicaid benefits that are valued at $28 per week. (For details on the income and Social Security taxes, see Appendix A.) I also estimate that the fixed costs of working (excluding child care costs) average $21 per week. Thus lost welfare benefits, increased taxes, lost Medicaid benefits, and fixed costs of working eat up $198 of the $208 in earnings. On top of this, the typical single mother may face child care costs that I have not included.

All in all, it is easy to see that market work may not be an optimal decision given the constraints that the typical single mother faces. In fact, since at the mean wage in the data, working rather than collecting AFDC and food stamp benefits appears to be a money-losing proposition, the real mystery is, why do so many women in this sample work at all?

A Labor Supply Model

The area of labor economics that studies the effect of wages, nonlabor income, and other factors on individual decisions about how much to work in the market is called *labor supply.* To analyze the various welfare reform proposals, I will construct and use a labor supply model. Here I describe the components of the model. (In Appendix B I estimate the coefficients of the model's equations that represent the relationships between its variables.)

In standard labor supply models, utility is specified as a function of hours of market work (H) and income (Y), giving a utility function of the form $U(H,Y)$. In these models, people are assumed to like income but to dislike working, so that U is increasing in Y and decreasing in H. In static labor supply models, people are assumed to maximize current period utility subject to a current period budget constraint of the form $Y(H) = wH + N$, where w is the hourly wage rate and N is nonlabor income.

Given a parametric specification for $U(H,Y)$, one can derive a labor supply equation, and its coefficients can be estimated using data on hours of work, wages, and nonlabor income of individuals. Given these estimates, one can derive elasticities of labor supply with respect to wages and nonlabor income—that is, how much hours of work will change in response to changes in wages and nonlabor income. A large literature exists in labor economics that derives such elasticities for data on married women and

single women without children (Killingsworth and Heckman 1986).

For the labor supply of single mothers, the simple labor supply model must be elaborated. Most importantly, since such a large percentage of single mothers are poor, the model must include available welfare benefits in the mothers' budget constraint. Also, the fixed costs of working in the market (such as child care expenses) are often substantial relative to potential wage earnings for this group, so these costs must also be part of the budget constraint.

As we have seen, the major welfare programs relevant for single mothers are the AFDC, food stamp, public housing, and Medicaid programs. In a recent paper, Moffitt and I (1995) developed a model of the behavior of single mothers that incorporates all four of these programs, along with taxes and work expenses in the budget constraint. The model I will present here is identical to that one.

Let P_A be an indicator function equal to 1 if a person participates in the AFDC program and 0 otherwise. Let P_F and P_R be the corresponding indicators for food stamp and public housing participation, respectively. Then the budget constraint takes this form:

$$(1)\quad Y(H,P_A,P_F,P_R) = wH + N + B_A(H)P_A + B_F(H)P_F + \gamma_R B_R(H)P_R + \gamma_{Med}B_{Med}P_A + \gamma_{Pri}B_{Pri}(1-P_A) - T(H) - E(H) - C(H).$$

I will describe in turn the various components in this constraint.

The function $B_A(H)$ represents AFDC benefits if the person works H hours. As hours of work increase, income rises, causing AFDC benefits to fall, as was illustrated earlier. The function $B_A(H)$ depends on characteristics of the person, like her wage rate, number of children, and state of residence. (See the benefit formulas in Appendix A.) But these arguments are suppressed here for notational convenience. Similarly, $B_F(H)$ and $B_R(H)$ represent food stamp and public housing benefits as a function of work hours.

While the evidence suggests that households value food stamps as equivalent to cash (Moffitt 1989), it also suggests that public housing benefits are valued less than cash (Smeeding 1982, Jencks and Edin 1990). In addition, housing benefits are rationed. Public housing is available only to those who queue for several years, and Section 8 subsidies are restricted in quantity. These influences are captured in equation (1) by the parameter γ_R, which represents the extent to which housing benefits are discounted relative to cash and the extent to which participation rates respond to changes in housing benefits in the first place (in light of possible rationing).

In equation (1), B_{Med} represents the expected value of Medicaid benefits to the household, as calculated by Moffitt and Wolfe (1992). This value depends on household characteristics like household size and health status. In the budget constraint, this Medicaid value is multiplied by P_A, the AFDC participation indicator, since Medicaid benefits are automatically available to anyone receiving AFDC benefits, and others are rarely eligible. If a household is not receiving AFDC benefits, it may be covered by private health insurance. So, in equation (1), B_{Pri} is the expected value of private health insurance benefits to the household, also constructed by Moffitt and Wolfe. It is equal to the product of the predicted probability of private health insurance coverage and the expected value of benefits if covered, where both depend on household characteristics. Since Medicaid and private health insurance provide in-kind rather than cash benefits, the parameters γ_{Med} and γ_{Pri}, which translate these benefits into cash equivalent values, are also included in (1).

Finally, (1) includes $T(H)$, $E(H)$, and $C(H)$ to represent taxes and work and child care expenses, respectively. Work expenses include directly work-related expenses (like transportation and work clothes). (Construction of taxes and expenses is described in Appendix A.)

One could have a model in which people maximize the utility function $U(H,Y)$ subject to the budget constraint (1). This would find the hours of work and welfare program participation combination that maximizes utility.[11] But such a model would not be adequate to describe the behavior of single mothers because of the problem of *nonparticipating eligibles.* Specifically, the data include many single mothers who have income low enough for them to be eligible to collect benefits from one or more welfare programs, but these mothers do not in fact collect them. This behavior is impossible if people are maximizing a utility function that depends only on hours and income subject to a budget constraint like (1). Such a model cannot account for why these people are passing up free money. Thus the labor supply model must be modified to account for nonparticipating eligibles.

There are several ways to do this. First, we could assume that the data have some degree of measurement error. That is, a nonparticipating eligible may have a true income higher than her measured income, so that she isn't really eligible. Or she may actually be participating, but be miscoded as a nonparticipant in the data. Second, we could assume that participation in welfare programs has real costs—for example, the cost in time and money of going to the Department of Health and Human Services and filling out the necessary forms. Third, we could assume that welfare program participation has psychic costs, sometimes referred to as *welfare stigma.*

Following Moffitt (1983), Moffitt and I (1995) chose to account for nonparticipating eligibles by allowing for direct utility costs of welfare program participation, or welfare stigma. Thus the utility function is specified as $U(H, Y,P_A,P_F,P_R)$, where U is reduced if $P_m = 1$ for $m = A, F, R$. Moffitt and I also make an additive separability assumption, so that $U(H,Y,P_A,P_F,P_R) = U_1(H,Y) + U_2(P_A, P_F,P_R)$, where U_1 is the part of the utility function that depends on hours and income while U_2 is the part that depends on program participation status. For U_1 we assume a quadratic function in H and Y, while for U_2 we assume a form that allows for economies of scale in the costs of program participation. The form of the utility function is

$$(2)\quad U(H,Y,P_1,P_2,...,P_m) = \alpha H + Y - \beta_H H^2 - \beta_Y Y^2 - \lambda(\psi_A P_A + \psi_F P_F + \psi_R P_R) - (1-\lambda)\max(\psi_A P_A, \psi_F P_F, \psi_R P_R).$$

Note that in the $U_1(H,Y)$ function, the coefficient on Y is set to 1. Thus the marginal utility of Y at $Y = 0$ is normalized to 1. The remaining parameters can therefore be interpreted in dollar terms. The parameter α represents the marginal disutility of work at $H = 0$. The quadratic terms β_H and β_Y are critical for determining the elasticity of labor supply with respect to the wage and nonlabor income.

In the $U_2(P_A,P_F,P_R)$ function, each ψ_m denotes the marginal disutility of participating in program m, for $m = A, F, R$. Thus, if ψ_m is sufficiently large, a particular program may not be chosen even though participation increases U_1. The parameter λ falls between 0 and 1. This specification allows participation costs to fall somewhere between perfect additivity (λ=1) and perfect nonadditivity (λ=0), the latter corresponding to a situation where the stigma and other costs of participating in one program are not increased by participating in multiple programs.

It is convenient both analytically and empirically to restrict attention to the case where hours worked can take on a discrete number of values. Therefore, consider the choice of $H = 0$, 20, and 40 hours per week, taken as the choice of nonwork, part-time market work, and full-time market work, respectively. With three hours levels and three programs in which a person is eligible to participate, the choice set has $3 \times 2^3 = 24$ alternatives. (Recall that Medicaid is not included in the choice set, but is included as a benefit automatically conferred by the choice of AFDC.) Let $j = 1, ..., 3 \times 2^3$ index alternatives; then the choice problem is simply to

(3) Choose alternative j if and only if
$U_j \geq U_k$ for all $k = 1, ..., 3 \times 2^3$

where U_j denotes the evaluation of (2) for combination j obtained by inserting (1) evaluated at that combination into (2) and by setting H and the P_m at their appropriate values for combination j.

In order to econometrically estimate the model on the survey data, we must specify a stochastic structure. That is, since single women with identical observed characteristics make different decisions about labor supply and welfare program participation, we must allow for random influences on these decisions. The stochastic structure Moffitt and I (1995) use permits α and the ψ_m to vary in the population conditional on a set of observable socioeconomic characteristics:

$$\alpha = X'\bar{\alpha} + \varepsilon_\alpha \quad (4)$$

$$\psi_m = X'\bar{\psi}_m + \varepsilon_m \quad (5)$$

for $m = A, F,$ or R, where X is a vector of socioeconomic characteristics, $\bar{\alpha}$ and $\bar{\psi}_m$ are vectors of coefficients, and the ε terms are error terms. Recall that the parameter α represents the marginal disutility of work at $H = 0$, and the parameters ψ_m represent the disutilities, or costs, of program participation. Since wage rates are unobserved for nonworkers, we must also specify an equation for the wage determination process so that the unobserved wages of the nonworkers can be inferred. Moffitt and I (1995) specify a log wage equation:

$$\ln(w) = X'\phi + \varepsilon_w \quad (6)$$

where X is a vector of socioeconomic characteristics and ϕ is a parameter mapping those characteristics into wage-earning potential.

The vector X includes the number of children aged less than 18 years, the number of children aged less than 5, a southern residence dummy, the person's years of education, the person's age, an indicator for fair or poor health, a race dummy equal to 1 if a person is white and 0 otherwise, the unemployment rate in the person's state of residence, an indicator for residence in a large metropolitan area, the percentage of the labor force employed in the service sector in the person's state of residence, and AFDC administrative expenses per recipient in the person's state of residence. These variables may affect a person's reservation wage through their effect on α, a person's distaste for welfare program participation (ψ), or her wage-earning potential. Not all of these variables are assumed to affect all three aspects of behavior, as will be seen below.

Consider now how the stochastic structure (4)–(6) influences the labor supply participation choice model (1)–(3). Suppose that two people with identical observed characteristics X live in the same state. Suppose further that person A works in the market and participates in no welfare programs, while person B does not work and participates in the AFDC and food stamp programs. The model has three ways to rationalize this difference in behavior. First, person B may have received a low wage offer (that is, may have a large negative ε_w), so that if person B does work, she will receive a lower wage than person A. Second, person B may get greater disutility from work than does person A (that is, may have a more negative value of ε_α). Third, person A may have a greater distaste for welfare program participation than does B. (That is, person A may have a larger value of ε_m for $m = A, F,$ or R.) Setting this welfare stigma term (ε_m) high for many women lets the model take account of the fact that so many low-income single mothers work in the market even though working doesn't pay compared to welfare program participation.

Ideas for Reform

In this section I simulate the impact of alternative welfare reform proposals, using the model with the parameter estimates described in Appendix B. The purpose of all these proposals, remember, is to increase the number of welfare recipients who work in the market, while also reducing the size of the welfare rolls.

The estimated model's evaluations of the proposals are reported in Table 5. This table shows the model's simulated effect of each proposal on the labor supply and welfare program participation choices of the single mothers in the sample as well as on the average utility level of single mothers. The table also shows the cost of each proposal. Cost is defined as the net increase in welfare benefits paid out (including any change in initial benefits plus any new benefits created by the proposal) plus the net reduction in federal income and Social Security taxes paid as a result of the proposal. Cost increases are measured as percentage changes from the initial program cost, which is initial program benefits net of tax receipts.

At the top of Table 5 (in row 1), I have shown the model's *baseline* simulation—the predicted behavior of the single mothers in the sample given the welfare rules they actually faced. The model predicts that 25 percent of

the sample participate in the AFDC program while 33.5 percent receive food stamps. It also predicts that 34.6 percent do not work in the market while 10.4 percent work part-time and 55.0 percent work full-time. This implies an average weekly hours of work of 24.1. (Note that this is a condensation of the results on model fit presented in Table B2 in Appendix B.) The effect of each reform proposal will be compared to this baseline.

Reduce Benefit Tax Rates

Let's start with the proposal to cut the rate at which welfare program benefits are reduced if participants work in the market. Recall from the examples in Table 3 that welfare benefits fall substantially as labor earnings increase. As a result, the effective tax rate on labor earnings facing single mothers can often exceed 100 percent. Many people have argued that these high tax rates are the reason that welfare recipients rarely work. A forceful exposition of this perspective is that of Moynihan (1973). Those who think that welfare reform should make work pay often advocate reduced AFDC tax rates as a way to give single mothers on welfare an incentive to work.

Row 2 of Table 5 shows the model's predicted effect of reducing the rate at which AFDC benefits are taxed with labor income from 100 percent to 50 percent. Interestingly, the model predicts that such a change would have almost no effect on behavior (which is consistent with results in Levy 1979). Neither the percentages of single mothers predicted to participate in welfare nor the percentages predicted to work full- or part-time change noticeably. Also, this program change leads to only a 1 percent increase in program cost. How can this nonimpact of such a large reduction in the AFDC tax rate be explained? Fairly simply. The typical single mother in the sample who, under the original rules, participates in the AFDC program and does not work in the market, has such a low wage rate that, even with an AFDC tax rate of only 50 percent, her after-tax wage does not exceed her reservation wage. Thus she continues to choose not to work.

Let's try much greater cuts in benefit reduction rates. Row 3 of the table shows the effects of cutting the AFDC tax rate from 100 percent to only 10 percent and the food stamp tax rate from 30 percent to only 10 percent. Such drastic cuts do have a strong effect on market work behavior. The percentage of the single mothers who choose not to work is predicted to drop from 34.6 to only 27.9; this is a 19 percent reduction. However, this increase in work effort is achieved at considerable cost. The percentage of single mothers who participate in the AFDC program is predicted to increase from 25 percent to 32.8 percent, and the total cost of welfare programs is predicted to increase 79 percent. The source of the problem is that with such low benefit reduction rates, many single mothers can work full-time while still collecting substantial welfare benefits.

Clearly, cuts in benefit reduction rates must be drastic in order to have substantial effects on market work effort. This comes at the cost of substantial increases in welfare participation by working single mothers and substantial increases in overall welfare costs. Thus cuts in benefit reduction rates are not a cost effective way to encourage work.

The other problem with this proposal is that it actually increases the AFDC caseload. This same basic problem applies not only to cuts in AFDC benefit tax rates, but also to many proposals aimed specifically at encouraging AFDC participants to work in the market, such as offering them free child care if they choose to work, paying their work costs (for example, transportation costs), or giving them help searching or training for jobs. All such proposals actually increase the benefits of participating in the AFDC program and may therefore lead to increases in the program's caseload (Moffitt 1993).

Subsidize Wages

Another way to encourage single mothers to work in the market has been advocated in recent years: subsidizing their wages. Advocates of this proposal include Lerman (1985) and Haveman and Scholz (1994). These researchers have recognized that a major reason few single mothers work is that they tend to have low wage rates and high costs of work (due to the need to care for children). Thus, even with very low welfare benefit reduction rates, single mothers still have low after-tax wage rates, leaving them with little incentive to work. Wage subsidies are a way to directly attack this cause of low labor force participation.

Row 4 of Table 5 displays the impact of an across-the-board $1 per hour wage subsidy for all single mothers. Consistent with the strong uncompensated substitution effect estimate reported earlier, the model predicts a very strong labor supply response to such a wage increase. The percentage of single mothers who do not work in the market is predicted to drop from 34.6 percent to only 26.5 percent, a 23 percent reduction.

Although it has a strong effect on market work behavior, the across-the-board $1 per hour wage subsidy for all single mothers increases total welfare costs by more than 160 percent. The main problem with this proposal is that higher wage single mothers—who would have worked without the subsidy—receive the subsidy anyway. Thus I am led to consider ways to target wage subsidies toward lower wage single mothers.

Row 5 of Table 5 shows the effects of a targeted subsidy that provides a minimum hourly wage of $5 for all single mothers. In other words, women with wage rates below $5 receive a subsidy to raise their wage rates to $5. The model predicts that this type of wage subsidy would have even stronger effects on market work behavior than the across-the-board version. The percentage of single mothers who do not work is predicted to drop from 34.6 percent to only 22.4 percent, a 35 percent reduction. The cost of this targeted wage subsidy is less than that of the across-the-board subsidy. Nevertheless, it still leads to a substantial 128 percent increase in total program cost.

So I consider yet another type of targeted wage subsidy. Row 6 displays the effects of the type of subsidy proposed by Lerman (1985). This proposal is to provide to any single mother with an hourly wage rate below $6 a subsidy equal to 50 percent of the difference between her wage rate and $6. The model predicts that this type of subsidy would lead to a reduction in the percentage of single mothers who do not work in the market from 34.6 to 24.8 percent, a 28 percent reduction—not quite as much as the last version considered—and the subsidy is predicted to increase total welfare program costs only a bit less: 89 percent.

We see that wage subsidy schemes of the type recently proposed are indeed predicted to have strong effects on market work behavior. However, they are also likely to

cause very substantial increases in program costs. An additional problem with wage subsidies is that they may lead to collusive behavior between employees and employers. For example, if a government subsidy guarantees a minimum wage rate of $5 per hour, why wouldn't an employee agree to work for any wage below $5 per hour in return for an off-the-books side payment from the employer? Overall, the case for wage subsidies is not compelling.

Expand the Earned Income Tax Credit

Next I consider a type of reform that combines features of both the last two types: a cut in benefit reduction rates and a wage subsidy—that is, an expansion in the earned income tax credit. Since the late 1970s, the federal income tax code has given low-income workers a tax credit equal to some fraction of their earned income. However, until recently, this tax credit was a very minor feature of the tax code. For example, in 1984, the tax code specified that, for earned annual income up to $5,000, a person received a tax credit equal to 10 percent of earned income. The credit then stayed flat at $500 for earned annual income up to $6,000. Beyond that, the credit fell 12.5 cents for each additional dollar in annual income and fell to zero at an annual income of $10,000. Thus the earned income tax credit as it existed in 1984 at most reduced the federal tax payment of a low-income worker by $500 and the tax rate that worker faced by 10 percentage points (and only if the worker earned less than $5,000).

The Omnibus Budget Reconciliation Act of 1993 provides for a substantial expansion of the earned income tax credit over the 1993–96 period. For 1994, the law specifies that, for earned annual income up to $8,425, a person with two children receives a tax credit equal to 30 percent of earned income. The credit then stays flat at $2,528 for earned annual income up to $11,000. Beyond that, the credit falls by 17.7 cents for each additional dollar in annual income and falls to zero at an annual income of $25,300. Thus the earned income tax credit as it exists for 1994 can reduce the federal tax payment of a low-income worker by as much as $2,528 and reduce the tax rate such a worker faces by as much as 30 percentage points (provided the worker earns less than $8,425). Planned extensions of the earned income tax credit increase the credit to a maximum of 36 percent of earned income in 1995 and 40 percent of earned income in 1996. Also of key importance is that the credit has been made *refundable.* That means, if a person's federal tax bill is less than the credit, then not only is the person's tax reduced to zero, but the person also receives a payment from the federal government equal to the excess of the credit over the tax bill.

Row 7 of Table 5 considers the impact of an increase in the earned income tax credit from its 1984 level of 10 percent to its 1994 level of 30 percent. The tax credit parameters used in this simulation are the same as those in effect in 1994, but they have been converted into 1984 dollars. The model predicts that this expansion of the earned income tax credit will lead to a reduction in the percentage of single mothers who do not work in the market from 34.6 to only 26.2 percent, a 24 percent reduction. However, the change is predicted to increase total welfare program costs 51 percent. Of course, costs here are defined to include lost federal tax revenue due to the earned income tax credit as well as the increase in expenditures due to the refundable nature of the credit.

Row 8 of Table 5 considers the impact of a further increase in magnitude of the earned income tax credit to the 40 percent level planned for 1996. The model predicts that this would lead to a reduction in the percentage of single mothers who do not work in the market from 34.6 to only 23.9 percent, a 31 percent reduction. However, the resulting increase in total welfare program costs is predicted to be 93 percent.

In addition to its high cost, an expansion of the earned income tax credit can lead to undesirable strategic behavior. As described by Scholz (1993–94), when the credit as a percentage of income is high, the refundable nature of the credit may create an incentive to overreport income on federal tax forms. This problem could have been mitigated by excluding self-employment income from the earned income tax credit calculation. However, that was not done in the latest revision of this credit. Still, even if it had been, the likelihood of collusion between workers and their employers to overreport income when claiming the credit would remain high.

Subsidize the Fixed Costs of Working

Because many single mothers can get only low-paying jobs, these women may see the fixed costs of working in the market, such as child care expenses and the loss of Medicaid coverage, as a formidable barrier to working. Some people have proposed reducing those disincentives to market work by subsidizing some of those particular costs (Lerman 1988). Here I consider the effect of providing a subsidy for all fixed costs of working, taxed away at a rate of 6 cents for every dollar of income in order to limit the subsidy to low-wage women. Since the aim of the subsidy is to cover fixed costs of working, the AFDC and food stamp deductions for such fixed costs are simultaneously eliminated.

As is clear in row 9 of Table 5, the model predicts that this type of work subsidy would lead to a reduction in the percentage of single mothers who do not work from 34.6 to 27.7 percent, a 20 percent reduction. Also, the percentage of single mothers who participate in the AFDC program would drop from 25 to 20.8 percent, while the percentage who participate in the food stamp program would drop from 33.5 to 28.9 percent. Most interestingly, the model predicts that the fixed costs of working subsidy would be cost neutral. This result will be discussed further below.

From this analysis, a fixed costs of working subsidy may seem an ideal mechanism to encourage market work effort by single mothers. However, I see three problems with this type of subsidy. One is that implementation of such a subsidy would be difficult because it would require elicitation of single mothers' true work costs. If a single mother has relatives who could take care of her children while she works outside the home, she would have an incentive to report child care costs anyway in order to collect the subsidy. Such misreporting would be difficult to detect. Another problem with the fixed costs of working subsidy is that it is too broadly targeted. If a goal is to induce the largest possible number of single mothers to start working, the more cost effective way to do that is to target subsidy dollars at mothers who have relatively low fixed costs (that is, those with fewer children). A final problem with the fixed costs of working subsidy is that it is too limited as a policy instrument for getting more sin-

gle mothers to work: the subsidy has a maximum at actual fixed costs of working. All three of these problems point naturally to the next proposal, a direct work subsidy that is independent of the actual fixed costs of working.

Subsidize Work

My new idea for welfare reform which avoids the problems of the fixed costs of working subsidy is to offer a work subsidy to all single mothers. In the experiment I analyze here, all single mothers who work at least part-time receive a $23 per week work subsidy, which is taxed away at a 7 percent rate as earned income increases (and which goes to zero at a weekly income of $329). The subsidy is received regardless of whether or not a woman participates in welfare programs. The experiment assumes no change in the existing AFDC and food stamp benefit rules, with one exception. For women who choose to work in the market and participate in welfare programs, the existing AFDC and food stamp deductions for work-related expenses are eliminated (that is, are replaced by the work subsidy).

The last row of Table 5 shows the effect of this work subsidy. The model predicts that such a work subsidy would lead to a reduction in the percentage of single mothers who do not work in the market from 34.6 to 27.7 percent, a reduction of 20 percent (or 850,000 people). Also, the percentage of single mothers who receive AFDC benefits would drop from 25 to 20.8 percent, while the percentage who receive food stamps would drop from 33.5 to 28.9 percent. The model predicts that such a universal work subsidy would actually reduce total welfare program costs 3 percent. Furthermore, it would increase the average utility of single mothers 3 percent.

You may be surprised that an apparently small work subsidy could induce such a large number of single mothers to enter the labor force. To see why this is reasonable, note that in 1993 dollars, the $23 subsidy amount is roughly equivalent to $32 per week. A single mother with a wage rate of $5 per hour would earn $100 by working 20 hours and receive a $25 subsidy [32 – (0.07 × 100)], which is $1.25 per hour. Thus the subsidy raises her effective hourly wage rate from $5 to $6.25—a substantial increase.

How can a work subsidy save money while also increasing the utility of single mothers? This is illustrated in Chart 2. Line *ABC* is a typical budget constraint created by the AFDC and food stamp programs. Line *EDC* is what the constraint might look like without any programs (the usual linear budget constraint assumed in the labor supply literature). Thus the distances between *AE* and *BD* are the benefit amounts at 0 and 20 hours. At 40 hours (at *C*), benefits go to zero. The introduction of the work subsidy for any single mother who works at least part-time in the market shifts the budget constraint to *ABB′C′*. The distance *B′B* is the amount of the subsidy for part-time work. Since the subsidy is taxed away with earnings, the subsidy amount for full-time work *C′C* is smaller than *B′B*.

In Chart 2, indifference curves are drawn for a woman whose preferences cause her to choose point *A* (nonwork and full benefits) given the original constraint. With the introduction of the work subsidy, she can achieve higher utility by moving to the higher indifference curve through point *B′*. Thus she shifts to part-time market work. The subsidy saves money here because the combination of subsidy and welfare benefits paid to her if she works part-time, *B′D*, is smaller than the benefits she was receiving when she didn't work, *AE*.

Overall, the work subsidy will have two main effects. On the one hand, as shown in Chart 2, some women who were not working in the market before the subsidy are induced to work part-time. For every such woman, there is a net saving on total welfare costs since the magnitude of the subsidy is smaller than the magnitude of welfare benefits for nonworking women.[12] But on the other hand, some women who would have worked in the market anyway now receive a subsidy for doing so. This effect causes costs to increase. In the simulation, these two effects roughly cancel, and a small overall cost saving is achieved.

Note that it is cost effective to target the subsidy to encourage part-time market work because AFDC and food stamp benefits for a typical single mother drop by roughly two-thirds if she goes from nonwork to part-time work. Thus, of the possible savings that accrue to the government from getting welfare recipients to work, most can be achieved by getting them to work just part-time. This suggests targeting most subsidy dollars at encouraging nonworking single mothers to start working part-time. The reason the earned income tax credit is so much more expensive than a work subsidy is precisely that these tax credit payments are proportional to earned income; they are roughly twice as great for full-time as for part-time work.

A work subsidy would be a flexible policy instrument to encourage market work. For the parameters of the subsidy formula can easily be varied to achieve different levels of labor force participation.

Table 6 presents the model's simulated effects of various designs for the work subsidy. In each successive row of the table, both the basic subsidy amount and the rate at which the subsidy is taxed away are increased. Increasing both of these variables keeps most of the subsidy dollars targeted at part-time market workers. Looking down the rows of the table, we see that greater reductions in the number of nonworking single mothers can be achieved in return for modest increases in total government cost. Even the most generous subsidy considered—a $46 per week subsidy ($62 in 1993 dollars) taxed away at a 20 percent rate, which achieves a 32 percent reduction in the number of nonworking single mothers—leads to a much smaller cost increase (17 percent) than that created by the 1994 expansion in the earned income tax credit (51 percent). Yet the reduction in the percentage of single mothers who do not work in the market is substantially greater with the work subsidy (32 percent vs. only 24 percent).

Remember, though, that the simulations in Tables 5 and 6 are based on a model with estimated parameters. The predictions in the tables thus do not account for the parameter uncertainty that arises because these parameters are not known with certainty. Any statistical procedure for estimating model parameters produces not only point estimates, but also standard errors for those estimates that gauge the degree of parameter uncertainty. (See Appendix B.) To gauge this degree of uncertainty, I drew 250 vectors of parameter values from the estimated variance-covariance matrix of the model parameters. For each parameter vector, I simulated both the baseline and the effect of

the $23 work subsidy experiment. Then I calculated the standard errors of the model predictions across the parameter vector draws. Standard errors are reported for the statistics in the first two rows of Table 6.

According to the estimated standard errors, the predicted effects of the work subsidy on market work behavior and welfare program participation are highly statistically significant. The model predicts drops of 4.2 and 4.6 percentage points in AFDC and food stamp participation, respectively, and the standard errors for these changes are 0.39 and 0.45. (These standard errors are not shown in the table.) The model predicts changes of –6.9, 7.4, and 0.5 points in the percentages of single mothers who work zero hours, part-time, and full-time, respectively, and the standard errors for these changes (again, not shown) are 0.87, 0.87, and 0.25, respectively. The standard error for the predicted 3.4 percent utility increase is 0.4, and the standard error for the 3.4 percent cost reduction is 4.8. Thus a two-standard-error band for the cost change includes a cost increase as large as 6.2 percent—but this still leaves the work subsidy much less expensive than proposals to cut benefit tax rates, subsidize wages, or expand the earned income tax credit.[13]

A work subsidy would, of course, have its problems. It would require that employers give workers a form certifying that they usually work at least 20 hours per week. Then the work subsidy could be distributed efficiently through the tax system, as with the earned income tax credit. And as with the tax credit, wage subsidies, and fixed costs of working subsidies, a work subsidy would present opportunities for cheating. For example, in return for a small side payment from employees, employers might be willing to exaggerate worker hours so as to make them appear to work 20 hours per week when in fact they work less. Given the small sums of money that would be involved in most such transactions, however, it seems plausible that creation of a severe penalty, combined with an inexpensive enforcement mechanism that would generate a small probability of being caught, would be sufficient to discourage most firms from such behavior. Note also that with a work subsidy, cheating requires the cooperation of an employer, while with the existing earned income tax credit, one can cheat unilaterally simply by reporting nonexistent self-employment income. With the work subsidy, just as with the earned income tax credit, excluding the self-employed would make sense.

Conclusion

The goals of current welfare reform are to increase market work effort by low-income single mothers and reduce AFDC and food stamp caseloads without increasing the cost of welfare or reducing the well-being of low-income single mothers and their children.

The old ideas for building work incentives into the AFDC program all fail on at least one of these four criteria. In particular, the results presented here indicate that reducing benefit tax rates, subsidizing wages, and expanding the earned income tax credit enough to generate substantial increases in market work also lead to substantial increases in government costs.

In this article, I have considered a new idea for encouraging the work effort of single mothers: a work subsidy that any single mother would receive, as long as she works at least 20 hours per week. According to my simulations, such a subsidy can substantially increase work effort and reduce welfare caseloads. In contrast to other proposals, such a work subsidy can be designed to be roughly cost neutral. For example, a $32 per week subsidy (in 1993 dollars) taxed away at 7 cents for each dollar of income would reduce the number of nonworking single mothers 20 percent (by 850,000 people) and reduce net government expenditures on single mothers 3 percent. More generous subsidies could achieve greater reductions in the number of nonworking single mothers with modest cost increases.

Note that the work subsidy is far more cost effective than the earned income tax credit which is being substantially expanded over the 1994–96 period. My results indicate that the increase in the tax credit planned for 1996 will increase the total government cost of welfare programs for single mothers 93 percent while decreasing the number of nonworking single mothers 31 percent. In contrast, a work subsidy of $62 per week taxed away at a rate of 20 cents per dollar of income would achieve about the same reduction in the number of nonworking single mothers (32 percent), but while increasing total government costs just 17 percent.

The work subsidy also dominates recent proposals to subsidize some of the fixed costs of working (like child care expenses and the loss of Medicaid coverage). The results presented here indicate that such a subsidy would have effects similar to those of a work subsidy. But the work subsidy has several advantages: it doesn't require verification of a recipient's true fixed costs of working, it doesn't create an incentive for single mothers to switch from relatives to commercial child care providers, and its magnitude is not limited to the actual fixed costs of working. The work subsidy thus can be designed to create larger incentives for single mothers to enter the labor market.

Finally, from a political perspective, the work subsidy should be much more popular than existing welfare programs. A work subsidy would encourage people who participate in welfare programs to find market work—which is exactly what the U.S. public wants.

[1]In an NBC News/*Wall Street Journal* poll conducted in January 1995, 46 percent of the respondents listed welfare reform as a top legislative priority. Health care reform was the second most popular topic; it was called a top priority by 29 percent of the respondents.

[2]In a *TIME*/CNN poll conducted in December 1994, 78 percent of the respondents agreed with the statement that the "welfare system needs fundamental reform."

[3]Consider the evidence from variation in AFDC and food stamp benefits over time. In 1990 dollars, for a single mother with two children, the combined value of monthly AFDC and food stamp benefits in the average U.S. state was $615 in 1965 and rose to a peak of $915 in 1972. Since 1972, the average value of these benefits has steadily declined in real terms; the benefits have not been increased sufficiently rapidly to keep pace with inflation. By 1980, their average value had fallen to $785 per month, and by 1990, it had fallen to only $648 per month. Today, real benefits are back to the 1965 level. Yet births to unmarried women as a percentage of all births in the United States rose steadily from 8 percent in 1965 to 11 percent in 1970 to 18 percent in 1980 and to 28 percent in 1990. Note that most of the increase in the out-of-wedlock birth rate occurred after welfare benefits began to fall. Similar patterns hold for divorce and separation rates.

Consider also the evidence from variation in AFDC benefits across states. Ellwood (1988, p. 62) shows that in 1980 the number of children living in a single-parent family in a state was weakly negatively correlated with the AFDC benefit level in the state. Ellwood and Bane (1985, p. 144) find that in 1975 both the out-of-wedlock birth rates and the divorce rates were weakly negatively correlated with state AFDC benefit levels. When sophisticated econometric methods are used to control for omitted factors that may mask a positive relationship between AFDC benefit levels and various measures of family disintegration—using time series data or cross-section data or both—these results do not change: large and significant positive effects are simply not found. See the survey by Moffitt (1992).

[4]The other key difference is that the House bill takes seriously the notion that the AFDC program encourages out-of-wedlock births; the bill thus limits benefits for unwed mothers.

[5]The $5.20 mean for the population was obtained after calculating predicted wages for the nonworking women in the sample. The mean wage among the working women in the sample is $5.73. The predicted mean wage for the nonworking women is $4.40.

[6]Throughout this article, I use the urban consumer price deflator (CPI-U) to convert 1984 dollar amounts into 1993 dollar amounts.

[7]Of the 76 women who do not work in the market or collect any welfare benefits, most have sizable amounts of alimony, child support, or supplemental security income. In the sample, these other sources of income are highly concentrated among these women.

[8]Table 2 indicates that only 172 women, or 17.8 percent of the sample, are in public housing. This compares to 370 women, or 38.2 percent of the sample, who participate in the food stamp program. Since, by the construction of the benefit formulas, anyone who satisfies the income screen for food stamps will also satisfy the screen for public housing, we see that more than half of the single mothers who have low enough income to be eligible for housing benefits are either rationed out of them or refuse to accept them.

[9]The rent subsidy calculation assumes that the woman pays the fair market rent for her state of residence, as discussed in Appendix A.

[10]In the diagrammatic analysis of consumer choice, levels of goods are usually plotted on the vertical and horizontal axes. But market work hours are assumed to be a bad. Thus budget constraints are usually plotted with hours increasing as one moves from right to left, so that leisure, which is a good, is increasing as one moves from left to right.

[11]Estimation of a labor supply model in which $U(H,Y)$ is maximized subject to (1) is a rather difficult problem because of the complex nature of (1). The problems involved in estimation of labor supply models in the presence of such complex budget constraints are discussed by Hausman (1985) and Moffitt (1986).

[12]In Table 4 we saw that the average single mother in the sample receives $105 in AFDC and food stamp benefits if she does not work in the market and $46 in benefits if she works part-time. Since the average woman in the sample has an income of $104 if she works part-time, the average value of the subsidy for part-time work is approximately $16 [23 – 0.07(104)]. Conducting the thought experiment of shifting the average woman from nonwork to part-time work, we see that this would save $59 in benefit costs, a net saving of $43.

[13]Of course, as is typical in econometric work, these standard errors account only for parameter uncertainty and not for model uncertainty. A different functional specification for utility might lead to somewhat different model predictions.

Appendix A
Welfare Benefit Formulas

Here I describe the detailed formulas I use in the preceding paper to estimate the benefits of various U.S. welfare programs as well as the taxes and work expenses that program participants face.

AFDC

The Aid to Families with Dependent Children (AFDC) program is administered by state governments with guidance by the federal government. For my analysis, I use the 1984 formula for the monthly AFDC benefit:

$$\text{(A1)}\quad B_A = \min\{M, r[G_A - \max(0, wH+N-C-E)]\}$$
$$\text{if } wH + N < (1.85)Q \text{ and}$$
$$= 0 \text{ if not.}$$

(All income amounts are converted to weekly for my model estimation.)

In equation (A1), M is the maximum payment permitted in a state, r is the *ratable reduction* (a number between 0 and 1 by which the benefit may be reduced), G_A is the state grant level, w is the hourly wage rate, H is the hours of market work, N is nonlabor income, C is the child care expense deduction (for workers only), E is other deductible work-related expenses, and Q is the needs standard used to determine eligibility. The variables M, G_A, and Q vary by state and family size and are available from unpublished data provided by the Office of Family Assistance of the U.S. Department of Health and Human Services. The ratable reduction, r, is available from the U.S. Department of Health and Human Services (1985, p. 335). The limit on permissible work-related deductions in 1984 is $90 per month ($30 set-aside plus $60 maximum remaining expenses).

The AFDC benefit is reduced in some cases for families in public housing, as discussed below.

Food Stamps

For benefits from the federal food stamp program, I use the formula given in Fraker and Moffitt 1988, p. 27. The formula for the monthly food stamp benefit in 1984 is

$$\text{(A2)}\quad B_F = \max[F, G_F - 0.30Y_{n1}]$$
$$\text{if } wH + N < I_1 \text{ and } Y_{n1} < I_2 \text{ and}$$
$$= 0 \text{ if not.}$$

Here

$$\text{(A3)}\quad Y_{n1} = \max(0, 0.82wH + N + B_A - 95 - S)$$

$$\text{(A4)}\quad S = \min[134, \max(0, R - 0.5Y_{n2})]$$

$$\text{(A5)}\quad Y_{n2} = \max(0, 0.82wH + N + B_A - 95)$$

where G_F is the food stamp guarantee, F is a minimum benefit, Y_{n1} and Y_{n2} are two types of net income, I_1 and I_2 are the gross net income screens, S is a shelter deduction, and R is rent paid. The variables G_F, I_1, and I_2 vary with family size and are obtained from unpublished data provided by the Food and Nutrition Service of the U.S. Department of Agriculture. No parameters vary by state since the food stamp program is a national program.

Public Housing

Public housing in the United States takes the form of either private rental housing subsidized by the government (the Section 8 program) or housing owned by the government. In both programs, families with sufficiently low income and assets are eligible, and in both programs, the tenant is obligated to pay rent according to a formula set by the government. In Section 8 housing, the tenant pays the landlord the government-stipulated rent, and the government pays the landlord the increment necessary to bring the total up to an amount known as the *fair market rent* for the unit. (If the landlord charges a rent greater than this, the tenant must pay the landlord directly for the excess.) In government-owned housing, the government simply collects the rent and provides the housing itself.

For my analysis, the housing subsidy is taken as the difference between the tenant rental payment and the fair market rent. The latter is taken to be the same value for both government housing and private rental housing since no data are available on the fair market value of public housing. Fair market rents by county and by bedroom size for 1984 are obtained from the July 5, 1984, issue of the *Federal Register.* The data are linked to families by assuming that required bedroom size is one fewer than the number of family members (up to 3 rooms).

For participants not receiving AFDC benefits or for AFDC recipients in all but 10 states, the monthly rental payment (R) in 1984 is determined by the formula

$$\text{(A6)}\quad R = \max(0.10Y_g, 0.30Y_n)$$

where

$$\text{(A7)}\quad Y_g = wH + N + B_A$$

$$\text{(A8)}\quad Y_n = Y_g - 40K - C$$

where Y_g is gross income, Y_n is net income, K is the number of children, and C is the child care expense (calculated as described below).

The rental formula for families on AFDC in the remaining 10 states is

(A9) $R = \max(0.10Y_g, 0.30Y_n, rV)$

where r, again, is the ratable reduction in the state AFDC program and V is the shelter expense assumed by the state in calculating the AFDC grant level. This formula says that the federal housing agency assumes that in these states AFDC recipients will automatically receive r percent of V toward their rent, so they should pay at least that much. Values for V are taken from U.S. Department of Health and Human Services 1985, pp. 337–38.

In these 10 states, the AFDC benefit may be reduced as well. If $R < V$ in these states, then the AFDC benefit is reduced by $r(V–R)$. This secondary benefit reduction arises because the AFDC rules in these states do not permit the payment of the maximum shelter allowance, V, if the actual shelter payment of public housing participants is less than this amount (even though the housing agency assumes in its calculation that the maximum shelter allowance is provided).

In all states, families are ineligible for any type of public housing if $Y_g > L$, where L is a low-income limit set by the U.S. Department of Housing and Urban Development (HUD). The value of L varies by area; 1984 values are obtained from unpublished data provided by HUD.

Federal Taxes

All the women in the sample are assumed to have filed their income tax forms as heads of household in the calendar year 1984, to have taken the standard deduction, and to have taken one exemption per person in the family. AFDC benefits, food stamps, and housing subsidies are not included in income for tax purposes. Marginal tax rates and bracket endpoints are available from standard Internal Revenue Service sources. The earned income tax credit in 1984 is also assigned. The 1984 Social Security tax rate was 0.067 up to $37,800 of annual earnings.

General Work-Related Expenses

For my analysis, work-related expenses (E) are set at $90 per week, the sum of a standard $30 deduction for all market workers and a mean of $60 of extra deductions for AFDC recipients who work in the market (U.S. House of Representatives 1987, p. 435, Table 25). Child care expenses (C) are estimated for the AFDC and other programs as follows.

Nationally, in 1984 average child care deductions for women receiving AFDC benefits were $93 per month for those who had positive deductions (U.S. House of Representatives 1987, p. 435, Table 25). If we assume that these were generated by children aged less than 5 years old and that on average these families had two such children, then the deduction was approximately $46 per child per month.

AFDC agencies generally assume that child care expenses for part-time workers are roughly half of those for full-time workers, so I assume the same in order to apportion the $46 average across part-time and full-time workers. My data have 14 part-time working AFDC recipients for every 10 full-time working recipients, which implies that mean deductions are $33 per child per month for the former and $66 per child per month for the latter, for children under 5. The maximum allowable amount for part-time work, though not for full-time work, also varies by state. To capture cross-state variation, the $33 amount for part-time work is multiplied by the ratio of the state maximum for child care expense for part-time work to the national average across states of all such maximums. (State maximums for part-time work are taken from the individual state tables in U.S. Department of Health and Human Services 1985.)

Finally, since only 20 percent of working AFDC recipients take a deduction (U.S. House of Representatives 1987, Tables 23 and 25), I assume there is a 20 percent probability of a woman having a child care expense. (Otherwise, the woman may obtain child care from family members, for example.)

Appendix B
Model Estimation Results

Here I report the results of estimating the labor supply model used in the preceding paper to analyze the effects of various welfare reform proposals. This model is slightly different from the one described in the paper. The results of estimating that model suggest that it can predict nothing about public housing participation.* Therefore, the model estimated here (and simulated to produce the predictions in the paper) excludes public housing.

In order to estimate the model, I must assume a distribution of the model's error terms. Here the five error terms (ε_α, ε_A, ε_F, ε_R, and ε_w) are assumed to be distributed multivariate normal with an unrestricted covariance matrix with diagonal elements σ_j^2, $j = \alpha, A, F, R, w$, and with off-diagonal elements $\rho_{jk}\sigma_j\sigma_k$, $j, k = \alpha, A, F, R, w$. The complete set of parameters in the behavioral model is, then,

$$\theta = \left(\bar{\alpha}, \beta_H, \beta_Y, \bar{\phi}, (\psi_m, m = A,F,R), \lambda, \gamma_R, \gamma_{Med}, \gamma_{Pri}, (\sigma_j, j = \alpha,A,F,R,w), (\rho_{jk}, j,k = \alpha,A,F,R,w)\right).$$

The model parameters are estimated using the method of simulated maximum likelihood. See Keane and Moffitt 1995 for a detailed description of the estimation procedure.

Table B1 displays the estimation results. I will first discuss the estimates of the elements of the $\bar{\alpha}$ vector. The coefficients on the number of children aged less than 18 years (–0.16) and the number of children aged less than 5 (–0.31) indicate that having more children increases a mother's disutility of market work. Given the form of equation (2), the estimates imply that having an additional child younger than 18 increases the disutility involved in working 40 hours per week by $0.16 \times 40 = \$6.40$. If the child is under 5, there is an additional cost of $0.31 \times 40 = \$12.40$ (for a total of $18.80).

The positive coefficient on the southern residence dummy (0.90) implies that women who live in the southern part of the country have lower disutility of market work. Interestingly, neither education nor age nor race is statistically significant. This implies, for instance, that the disutilities from work for white and black single mothers are not significantly different. The fair or poor health coefficient is significantly negative (–0.59), implying that women in poor health have greater disutility from work. The coefficient on the state unemployment rate is close to zero, implying that women in states with higher unemployment rates do not have significantly greater distaste for work.

I turn next to the AFDC and food stamp disutility equations. In both of these, the coefficient on the number of children less than 18 is negative but insignificantly different from zero. This implies that women with more children do not have significantly less disutility from welfare program participation. In both equations, education is significantly positive (3.4 and 4.4). These estimates imply that an additional year of education increases the disutility from participation in the AFDC program by $3.40 and in the food stamp program by $4.40. The coefficients on age are also significant and positive in both equations (1.8 and 1.4). These estimates imply that an additional 10 years of age increases disutility from participation in the AFDC program by $18 and in the food stamp program by $14. The health variable is not significant in the disutility of participation equations. The white dummy is significant and positive in both equations (11.3 and 14.5), indicating that for whites the disutility of AFDC participation is $11.30 greater than for nonwhites, while for food stamps the corresponding figure is $14.50. This racial difference in preferences may well stem from the fact that blacks are more likely than whites to live in poor neighborhoods where

welfare participation is more common, so the stigma associated with welfare use is smaller.

Finally, state AFDC administrative expenses are significant and positive in the AFDC disutility equation but insignificant in the food stamp disutility equation. This makes sense, since AFDC administrative costs often go toward attempts to purge people from the AFDC rolls. Recall from the paper's Table 1 that for this program the mean state annual administrative expense per recipient is $479, with a standard deviation of $173 in the sample. The estimates imply that a $100 annual increase in administrative expense per recipient would increase disutility of AFDC participation $4.40 per week.

The estimates imply that for a typical 30-year-old black single mother of two with 12 years of education living in a northern state with average AFDC administrative expenses, the disutility derived from AFDC participation is $73 per week, while the disutility from food stamp participation is $37.30 per week. Compare these with AFDC and food stamp benefits at zero hours of market work in a typical state like Kansas, which are $76 and $38. Strikingly, the model implies that for a typical woman of this description, the distaste for AFDC and food stamp participation is roughly equal to the monetary benefit. This is how the model explains the fact that so many women in this population work despite the fact that, because of their low wages and the welfare benefit rules they face, work is often not a money-making proposition.

Finally, I turn to the wage equation estimates. Since the dependent variable is in log form, the coefficients in the wage equation can be interpreted (approximately) in percentage terms. The coefficient on education in this equation is 0.08 and highly significant, implying that each additional year of school raises the wage rate 8 percent. This is right in the ballpark of wage equation estimates typical in the human capital literature. The coefficients on age and age-squared imply a quadratic pattern, which is as expected. The estimates imply that wages are rising at a rate of 1.9 percent per year for a woman aged 30 and that they peak when she reaches age 42. This implies a much slower rate of wage growth with age and a much earlier peak than is observed for men. The estimates also indicate that poor health has a significant negative effect on wages, while race has no significant effect. Previous research has not found significant racial wage differentials among single mothers. The coefficient on the percentage of the labor force in the state that is employed in the service sector is positive and significant. Since single mothers would seem to be most likely to work in the service sector, this is presumably a labor demand effect.

Table B1 also contains estimates of additional utility function parameters, budget constraint parameters, and error covariance parameters. The estimate of β_H is 3.92 and that of β_Y is 3.19. Although interpreting these parameters directly is difficult, we will find it is useful to consider what such utility function estimates would imply in a standard labor supply model in which continuous hours were chosen subject to a linear budget constraint. In such a model, the uncompensated elasticity of hours with respect to the wage is $\eta_w = (w/H)[1–2\beta_Y N–4\beta_Y wH]/(2z)$, while the elasticity of hours with respect to nonlabor income is $\eta_Y = –\beta_Y w/z$, where $z = (\beta_H + \beta_Y w^2)$. Thus, at the mean value of wages, hours, and nonlabor income in the sample, the estimates imply that the uncompensated wage elasticity is 1.94, while the income elasticity is –0.18.

This is a strong uncompensated substitution effect and a weak income effect relative to the estimates in the labor supply literature that are typically obtained for married women and single women without children (Killingsworth and Heckman 1986). Thus the estimates imply that the labor supply of low-income single mothers should be very responsive to changes in wages (provided, of course, that the wage exceeds the reservation wage).

The estimate of λ is 0.05. This implies that the disutility associated with participation in both the AFDC and food stamp programs is only slightly greater than the disutility associated with AFDC participation alone. This helps to explain why those who receive AFDC benefits almost always receive food stamps too, even though in states with more-generous AFDC grants (like Minnesota) the value of food stamp benefits is typically small (Table 3 in the paper).

The estimate of γ_{Med} is 0.50 while that of γ_{Pri} is 0.73. Given the standard errors, this difference is not significant. Recall from the paper's Table 4 that the average person in the data has an expected value of Medicaid benefits equal to $28.01 if the person participates in the AFDC program and an expected value of private health insurance benefits equal to only $7.37 if she does not (where much of this divergence results from a low probability of private coverage for nonparticipants). Thus the point estimates imply that a value of $8.63 per week is assigned by the average sample member to expected extra medical coverage that is received by AFDC participants. [Note that $(0.50 \times 28.01) – (0.73 \times 7.37) = 8.63$.]

Finally, two of the estimated error correlations are significant. One is the estimated correlation between ε_A and ε_F, which is 0.58, implying that those who have a large disutility of AFDC participation (after observed socioeconomic factors are controlled for) also tend to have a large disutility of food stamp participation. The other significant correlation is that between ε_F and ε_w, which is 0.24, indicating that those with high wages (after observed socioeconomic factors are controlled for) also tend to have high disutility from food stamp participation.

Table B2 presents evidence on the fit of the model to the observed choice distribution. The model slightly underestimates the number of nonworkers (34.6 percent predicted vs. 40 percent actual), while overestimating the number of full-time workers (54.9 percent predicted vs. 49.6 percent actual). The chi-squared statistic for fit of predicted to actual choice frequencies in the 12-program participation–work status cells is 28.1 compared to a 5 percent critical value of 19.7. This type of mild rejection of model fit is rather common for structural models like this one because of all the theoretical restrictions the model imposes on the data. The reason this model cannot fit the choice distribution perfectly is that it also must fit the observed wage data.

Despite this mild rejection by the chi-squared fit test, Moffitt and I (1995) found that this model does very well in a stringent external validity test. Specifically, we used this model to backcast choice behavior in 1980, before substantial changes in the welfare benefit rules that included an increase in the AFDC benefit reduction rate from 66 percent to 100 percent. We found that the model predicts the differences in program participation and market work behavior in 1980 vs. 1984 quite accurately.

*When the model described in the paper was estimated with public housing participation included as an option in the individual choice sets, the estimate of γ_R was only slightly larger than zero, and it was statistically insignificant. Also, σ_R was estimated to be very large. The small value of γ_R implies that the magnitude of public housing benefits has little effect on whether a person collects them. The large value of σ_R implies that collection of public housing benefits is essentially a random process. Presumably, these results stem from two facts about public housing that were mentioned earlier. Public housing benefits are rationed, so collecting them is not really a choice, and many people have intense distaste for collecting them because it often implies living in a dangerous public housing project or in an undesirable neighborhood where Section 8 housing is available.

References

Burtless, Gary. 1989. The effect of reform on employment, earnings, and income. In *Welfare policy for the 1990's*, ed. Phoebe H. Cottingham and David T. Ellwood. Cambridge, Mass.: Harvard University Press.

Danziger, Sheldon; Haveman, Robert; and Plotnick, Robert. 1981. How income transfer programs affect work, savings, and the income distribution: A critical review. *Journal of Economic Literature* 19 (September): 975–1028.

Ellwood, David T. 1988. *Poor support: Poverty in the American family.* New York: Basic Books.

Ellwood, David, and Bane, Mary Jo. 1985. The impact of AFDC on family structure and living arrangements. In *Research in labor economics*, ed. Ronald Ehrenberg, Vol. 7. Greenwich, Conn.: JAI Press.

Fraker, T., and Moffitt, R. 1988. The effect of food stamps on labor supply: A bivariate selection model. *Journal of Public Economics* 35 (February): 25–56.

Hausman, Jerry A. 1985. The econometrics of non-linear budget sets. *Econometrica* 53 (November): 1255–82.

Haveman, Robert. 1980. Direct job creation. In *Employing the unemployed*, ed. Eli Ginsberg. New York: Basic Books.

Haveman, Robert H., and Scholz, John Karl. 1994. The Clinton welfare reform plan: Will it end poverty as we know it? *National Tax Journal* 47 (June).

Jencks, Christopher. 1992. *Rethinking social policy: Race, poverty and the underclass.* Cambridge, Mass.: Harvard University Press.

Jencks, Christopher, and Edin, Kathryn. 1990. The real welfare problem. *American Prospect* (Spring): 31–50.

Keane, Michael P., and Moffitt, Robert. 1995. A structural model of multiple welfare program participation and labor supply. Research Department Working Paper. Federal Reserve Bank of Minneapolis.

Killingsworth, Mark R., and Heckman, James J. 1986. Female labor supply: A survey. In *Handbook of labor economics*, ed. Orley Ashenfelter and Richard Layard, Vol. 1, 103–204. Amsterdam: North-Holland.

Lerman, Robert I. 1985. Separating income support from income supplementation. *Journal of the Institute for Socioeconomic Studies* 10 (Autumn): 101–25.

_____. 1988. Nonwelfare approaches to helping the poor. *Focus* 11 (Spring): 24–28. Institute for Research on Poverty, University of Wisconsin, Madison.

Levy, Frank. 1979. The labor supply of female heads, or AFDC work incentives don't work too well. *Journal of Human Resources* 14 (Winter): 76–97.

Meyer, Daniel R. 1993. Child support and welfare dynamics: Evidence from Wisconsin. *Demography* 30 (February), 45–62.

Moffitt, Robert. 1983. An economic model of welfare stigma. *American Economic Review* 73 (December): 1023–35.

_____. 1986. The econometrics of piecewise-linear budget constraints: A survey and exposition of the maximum likelihood method. *Journal of Business and Economic Statistics* 4 (July): 317–28.

_____. 1989. Estimating the value of an in-kind transfer: The case of Food Stamps. *Econometrica* 57 (March): 385–409.

_____. 1992. Incentive effects of the U.S. welfare system: A review. *Journal of Economic Literature* 30 (March): 1–61.

_____. 1993. The effect of work and training programs on entry and exit from the welfare caseload. Discussion Paper 1025-93. Institute for Research on Poverty, University of Wisconsin, Madison.

Moffitt, Robert, and Wolfe, Barbara L. 1992. The effect of the Medicaid program on welfare participation and labor supply. *Review of Economics and Statistics* 74 (November): 615–26.

Moynihan, Daniel P. 1973. *The politics of a guaranteed income: The Nixon administration and the family assistance plan.* New York: Random House.

Sample, Herbert A. 1994. Battle shapes up on GOP's plan to overhaul welfare. *Sacramento Bee,* December 30: A1.

Scholz, John Karl. 1993–94. Tax policy and the working poor: The earned income tax credit. *Focus* 15 (Winter): 1–12. Institute for Research on Poverty, University of Wisconsin, Madison.

Smeeding, Timothy M. 1982. Alternative methods for valuing selected in-kind transfer benefits and measuring their effect on poverty. Technical Paper 50. Washington, D.C.: U.S. Department of Commerce, Bureau of the Census.

U.S. Bureau of the Census. 1994. *Statistical abstract of the United States: 1994.* 114th ed. Austin, Texas: Reference Press.

U.S. Department of Health and Human Services. 1985. *Characteristics of state plans for Aid to Families with Dependent Children: 1985 edition.* Washington, D.C.: U.S. Government Printing Office.

U.S. House of Representatives. 1987. *Background material and data on programs within the jurisdiction of the Committee on Ways and Means.* Washington, D.C.: U.S. Government Printing Office.

Weiss, Yoram. 1986. The determination of life cycle earnings: A survey. In *Handbook of labor economics*, ed. Orley Ashenfelter and Richard Layard, Vol. 1, pp. 603–40. Amsterdam: North-Holland.

Willis, Robert J. 1986. Wage determinants: A survey and reinterpretation of human capital earnings functions. In *Handbook of labor economics*, ed. Orley Ashenfelter and Richard Layard, Vol. 1, pp. 525–602. Amsterdam: North-Holland.

Table 1

The Sample*

Characteristics of Low-Income Single Mothers in the United States in the Fall of 1984

Variable	Average (Mean)	Standard Deviation
Income		
Hourly Wage** (1984 $)	5.20	2.39
Weekly Nonlabor Income (1984 $)	4.36	15.46
Personal Characteristics		
Education (Years)	11.48	2.50
Age (Years)	33.81	8.93
Number of Children		
Younger Than 18 Years	2.06	1.24
Younger Than 5 Years	.53	.76
White (%)	61	—
Health Poor or Fair (%)	14	—
Marital Status (%)		
Never Married	24.4	—
Married, But Husband Not in Home	3.2	—
Widowed	6.7	—
Divorced	43.4	—
Separated	22.3	—
Location		
Southern State (%)	35	—
Large Metropolitan Area (%)	59	—
State Characteristics		
Unemployment Rate (% of Labor Force)	7.71	1.83
Service Sector (% of Employment)	21	3
Annual AFDC Administrative Expenses per Recipient (÷ 100) (1984 $)	4.79	1.73

*These data are from a survey taken in the fall of 1984. The sample used here includes 968 women aged 18–64 with children younger than 18 years. It excludes women with asset levels over $4,500, wage rates over $15 per hour, and nonlabor income more than double the limit for participation in the food stamp program. It also excludes women who are self-employed or for whom some data are missing.

**The hourly wage includes predicted wages for women who do not work.

Source of basic data: U.S.Commerce Department, Bureau of the Census

Table 2

Work and Welfare Program Participation in the Sample*

Welfare Program Participation	Number of Women Who			In Each Level of Program Participation		
		Work				
	Don't Work	Part-Time**	Full-Time	Total Number of Women	% of Sample	% Who Work
No Programs	76	57	383	516	53%	85%
One Program						
Aid to Families with Dependent Children (AFDC)	9	1	7	17	2	47
Food Stamps	36	20	32	88	9	59
Public Housing	10	6	46	62	6	84
Two Programs						
AFDC and Food Stamps	162	11	2	175	18	7
AFDC and Public Housing	3	0	0	3	0	0
Food Stamps and Public Housing	14	4	9	27	3	48
Three Programs	77	2	1	80	8	4
Total Number of Women	387	101	480	968	100%	60%
% of Sample	40%	10%	50%	100%		

*For a description of the sample, see the note to Table 1.

** *Part-time* work is defined as an average of 1–35 hours of work per week.

Source of basic data: U.S. Commerce Department, Bureau of the Census

Table 3

Under Current Welfare Programs, Why Work?

Income and Tax Rates Faced by a Woman Eligible for Welfare Programs* in States With High, Average, and Low Benefits (in 1984 Dollars)

State	Type of Income and Tax	Weekly Income ($) From Optional Hours of Work: 0	20	40	Tax Rate (%)** in Changing Work Hours From: 0 to 20	0 to 40
All States	Earnings From Work	0	104	208	—	—
Minnesota: A High-Benefit State	Welfare Program Benefits					
	AFDC	117	25	0	88	56
	Food Stamps	19	19	0	0	9
	Public Housing	97	91	64	6	16
	Taxes	0	–8	–26	8	13
	Work Expenses	0	–21	–21	20	10
	Net Income					
	With Housing	233	210	225	122	104
	Without Housing	136	119	161	116	88
Kansas: An Average-Benefit State	Welfare Program Benefits					
	AFDC	76	0	0	73	37
	Food Stamps	38	31	0	7	18
	Public Housing	68	64	31	4	18
	Taxes	0	–8	–26	8	13
	Work Expenses	0	–21	–21	20	10
	Net Income					
	With Housing	182	170	192	112	95
	Without Housing	114	106	161	108	77
Alabama: A Low-Benefit State	Welfare Program Benefits					
	AFDC	23	0	0	22	11
	Food Stamps	48	31	0	16	23
	Public Housing	94	67	34	26	29
	Taxes	0	–8	–26	8	13
	Work Expenses	0	–21	–21	20	10
	Net Income					
	With Housing	165	173	195	95	86
	Without Housing	71	106	161	66	57

*The calculations assume an hourly wage of $5.20 and no child care expenses.

**For each type of income or tax variable, the tax rate in changing from 0 to 20 hours of work is calculated by taking the difference between the weekly income with 20 hours and that with 0 hours of work; dividing by $104, the earnings from 20 hours of work; and subtracting this quotient from 1. The tax rate in changing from 0 to 40 hours is calculated in an analogous way, with $208, the earnings from 40 hours of work, as the divisor.

Table 4

How Work Changes Income and Taxes in the Sample*

Type of Income and Tax	Hours of Work	Dollar Value: Average (Mean)	Dollar Value: Standard Deviation
Earnings From Work	20	104.00	47.80
	40	208.00	95.60
Welfare Program Benefits			
AFDC	0	63.53	41.01
	20	13.74	25.65
	40	2.20	11.83
Food Stamps	0	41.49	17.67
	20	31.91	19.69
	40	15.45	19.10
Public Housing	0	94.67	24.08
	20	81.39	27.53
	40	56.58	34.39
Medicaid**	—	28.01	22.22
Private Health Insurance Benefits†	—	7.37	8.19
Positive Taxes	20	8.01	5.98
	40	23.94	20.98

*All variables are weekly. The AFDC, food stamp, and housing benefits are means over the sample if a person participates in all three programs. For nonworkers, variables are evaluated at the person's expected wage.

**This is an estimate of the person's typical value of medical insurance benefits if she is receiving AFDC benefits. It equals the expected value of Medicaid benefits.

†This is an estimate of the person's typical value of medical insurance benefits if she is not receiving AFDC benefits. It equals the product of the probability of private coverage and the expected benefits if she is covered.

Source of basic data: U.S. Commerce Department, Bureau of the Census

Table 5

The Model's Predicted Effects of Alternative Welfare Reform Proposals...

Row	Proposal	% Who Participate in a Welfare Program		% Who Don't or Do Work			Mean Hours Worked Weekly*	% Change in		
					Work					
		AFDC	Food Stamps	Don't Work	Part-Time	Full-Time		Number Not Working	Welfare Program Cost	Woman's Utility
1	Baseline: Current Rules	25.0	33.5	34.6	10.4	55.0	24.1	—	—	—
	*Reduce Benefit Tax Rates***									
2	Decrease AFDC Tax Rate From 100% to 50%	25.7	33.7	33.7	11.5	54.8	24.3	–3	1	0
3	Decrease AFDC and Food Stamp Tax Rates to 10%	32.8	40.0	27.9	14.4	57.7	26.0	–19	79	5
	Subsidize Wages									
4	Increase Wage Rate $1	20.9	28.9	26.5	9.7	63.8	27.5	–23	162	17
	Use Targeted Subsidies									
5	Set Minimum Wage at $5	19.1	26.8	22.4	10.8	66.8	28.9	–35	128	13
6	Subsidize Wage Below $6 [0.5($6 – Wage)]	20.3	28.3	24.8	10.6	64.6	28.0	–28	89	11
	Expand the Earned Income Tax Credit									
7	Increase Credit to 30%†	19.6	28.1	26.2	16.9	56.9	26.1	–24	51	8
8	Increase Credit to 40%‡	18.5	27.5	23.9	19.7	56.4	26.5	–31	93	12
9	*Subsidize the Fixed Costs of Working*§	20.8	28.9	27.7	17.1	55.2	25.5	–20	0	4
10	*Subsidize Work*§	20.8	28.9	27.7	17.8	54.5	25.4	–20	–3	3

*Mean Hours Worked = 20(Part-Time Hours) + 40(Full-Time Hours).

**Here the tax applies only to earned income. All income screens are simultaneously eliminated. (See Appendix A.)

†This is the increase adopted for 1994. It is a refundable tax credit equal to 30% of earned income up to $6,000 (in 1984 dollars). The credit stays flat at $1,800 for earned income up to $7,850. Beyond that, there is a 17.7% phaseout rate.

‡This is the increase adopted for 1996. It is a refundable tax credit equal to 40% of earned income up to $5,750 (in 1984 dollars). The credit stays flat at $2,300 for earned income up to $7,500. Beyond that, there is a 21.1% phaseout rate.

§For the last two proposals, all AFDC and food stamp program deductions for work expenses are eliminated and replaced by a work subsidy that is also offered to people not participating in welfare programs. In row 9, the fixed costs of working subsidy = Fixed Costs – 0.06(income). In row 10, the work subsidy = $23 – 0.07(income).

Table 6

. . . And Alternative Work Subsidy Designs

(Numbers in Parentheses = Standard Errors.)

Work Subsidy		% Who Participate in a Welfare Program		% Who Don't or Do Work			Mean Hours Worked Weekly*	% Change in		
					Work					
Weekly Amount ($)	Income Tax Rate (%)	AFDC	Food Stamps	Don't Work	Part-Time	Full-Time		Number Not Working	Welfare Program Cost	Woman's Utility
Baseline: No Subsidy		25.0 (1.1)	33.5 (1.2)	34.6 (1.1)	10.4 (.9)	55.0 (1.2)	24.1 (.4)	—	—	—
Subsidy Alternatives										
23	7	20.8 (1.1)	28.9 (1.2)	27.7 (1.4)	17.8 (1.5)	54.5 (1.3)	25.4 (.5)	–19.9	–3.4 (4.8)	3.4 (.4)
29	10	20.3	28.5	26.4	19.9	53.6	25.4	–23.7	1.1	4.0
31	11	20.1	28.3	26.0	20.7	53.3	25.5	–24.9	3.1	4.2
33	12	19.9	28.2	25.6	21.4	53.0	25.5	–26.0	5.6	4.5
35	13	19.8	28.1	25.2	22.1	52.7	25.5	–27.2	8.2	4.7
40	16	19.3	27.7	24.4	23.8	51.8	25.5	–29.5	12.3	5.1
46	20	18.9	27.3	23.5	25.8	50.7	25.4	–32.1	16.8	5.4

*Mean Hours Worked = 20(Part-Time Hours) + 40(Full-Time Hours).

Chart 1

How a Wage Increase Can Affect the Decision to Work

Preferred and Possible Combinations of Work and Income

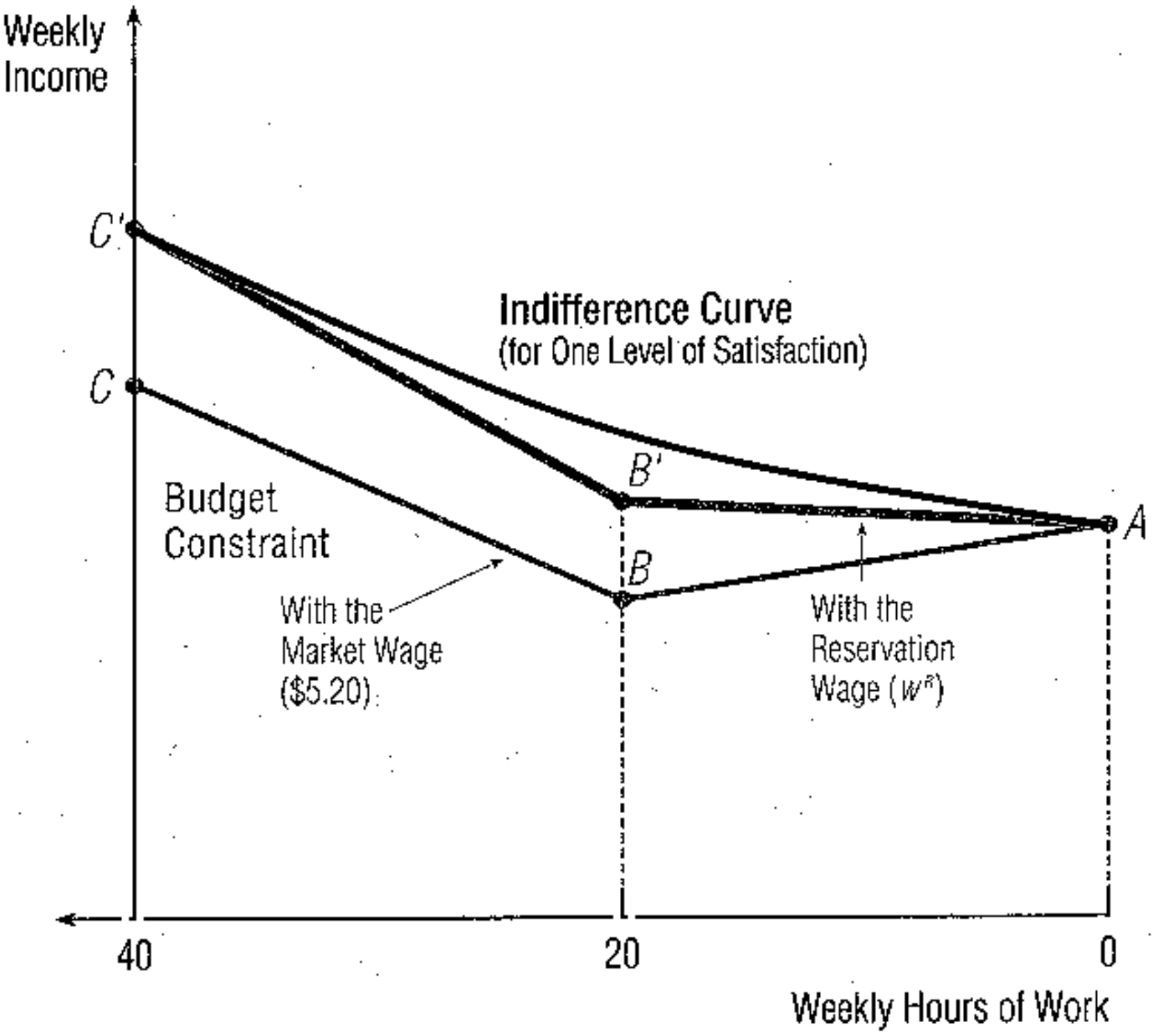

Chart 2

How a Work Subsidy Can Affect the Decision to Work

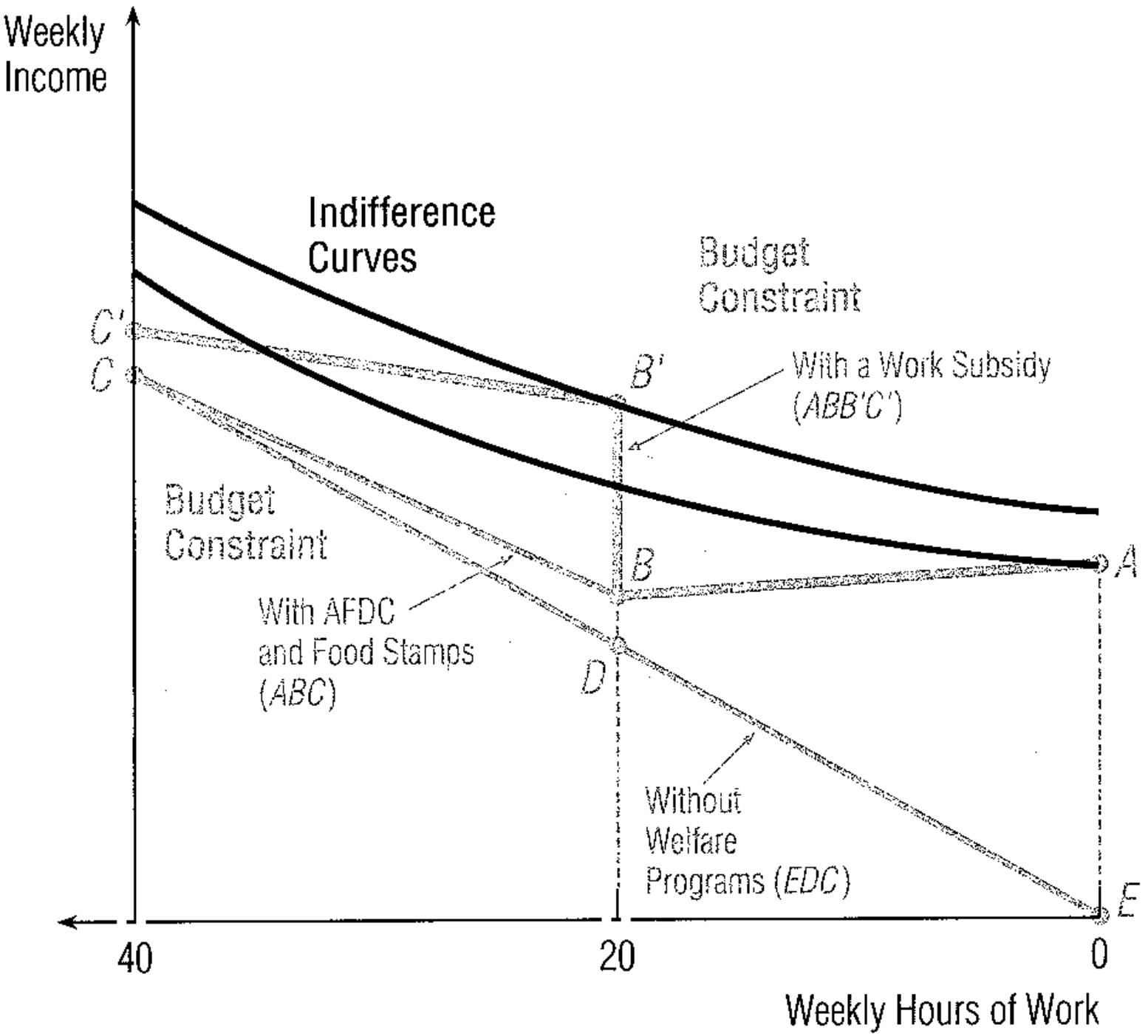

Table B1

The Estimated Model

Estimated by Simulated Maximum Likelihood, After Excluding Public Housing

(Numbers in Parentheses = Standard Errors.)

Variable	Value of Variable's Relationship to: Taste for Work (α)	Costs of Program Participation: AFDC (ψ_A)	Costs of Program Participation: Food Stamps (ψ_F)	Wages (w)
Personal Characteristics				
Education	.02 (.05)	3.4* (1.2)	4.4* (1.3)	.08* (.01)
Age	.10 (.09)	1.8* (.4)	1.4* (.4)	.10* (.02)
Age-Squared (÷ 100)	–.13 (.11)	—	—	–.12* (.02)
Number of Children Younger Than 18 Years	–.16* (.10)	–1.5 (2.2)	–2.0 (2.2)	—
Younger Than 5 Years	–.31* (.14)	—	—	—
White	.33 (.18)	11.3* (5.2)	14.5* (5.3)	.03 (.04)
Health Poor or Fair	–.59* (.27)	2.6 (7.1)	–4.1 (6.9)	–.18* (.07)
Location				
Southern State	.90* (.22)	–16.0* (5.2)	–2.5 (5.0)	.04 (.05)
Large Metropolitan Area	—	—	—	.03 (.04)
State Characteristics				
Unemployment Rate	–.01 (.04)	—	—	—
Service Sector	—	—	—	2.19* (.78)
Annual AFDC Administrative Expenses per Recipient (÷ 100)	—	4.4* (1.4)	–1.7 (1.3)	—
Constant	–2.36 (1.78)	–39.9* (20.7)	–45.4* (21.4)	–2.03* (.33)
Error Standard Deviation (σ)	1.65* (.27)	41.0* (4.4)	46.7* (6.9)	.51* (.01)

Other Parameters

Utility Function†

Hours of Work Squared	$\beta_H = 3.92^*$ (.47)
Income Squared	$\beta_Y = 3.19^*$ (1.49)
Extra Disutility From Second Program	$\lambda = .05^*$ (.02)

Budget Constraint

Medical Insurance Benefits Medicaid	$\gamma_{Med} = .50^*$ (.25)
Private Health Insurance	$\gamma_{Pri} = .73$ (.70)

Labor Supply Elasticities

Wages	$\eta_w = 1.94$
Income	$\eta_Y = -.18$

Correlation Matrix of Errors (ε)

	AFDC	Food Stamps	Wages
Work	–.00 (.07)	.06 (.08)	–.07 (.12)
AFDC	—	.58* (.06)	–.01 (.07)
Food Stamps	—	—	.24* (.06)

Simulated Log Likelihood = –1,826.5

Choices-Only Simulated Log Likelihood = –1,391.4

Chi-Squared Statistic = 28.1

* = Significant at 10% Level.

Sample Size = 968.

Normalization $\tau = 2$.

†The value for β_H has been multiplied by 100 and that for β_Y by 10,000.

Table B2

How Well the Model Fits the Sample Data

Fitted and Actual Distributions of Labor Supply and Welfare Program Participation, Percentages of Total*

Welfare Program Participation	Model or Actual	Labor Supply Participation			Total for Each Level of Welfare Program Participation
		Don't Work	Work		
			Part-Time	Full-Time	
No Programs	Model	7.3	7.4	48.9	63.6
	Actual	8.9	6.5	44.3	59.7
One Program					
AFDC	Model	1.7	.2	.9	2.8
	Actual	1.2	.1	.7	2.1
Food Stamps	Model	5.1	2.0	4.2	11.3
	Actual	5.2	2.5	4.2	11.9
Both AFDC and Food Stamps	Model	20.5	.8	.9	22.2
	Actual	24.7	1.3	.3	26.4
Total for Each Level of Labor Supply Participation	Model	34.6	10.4	55.0	100.0
	Actual	40.0	10.4	49.6	100.0

*Columns and rows may not sum to totals due to rounding.