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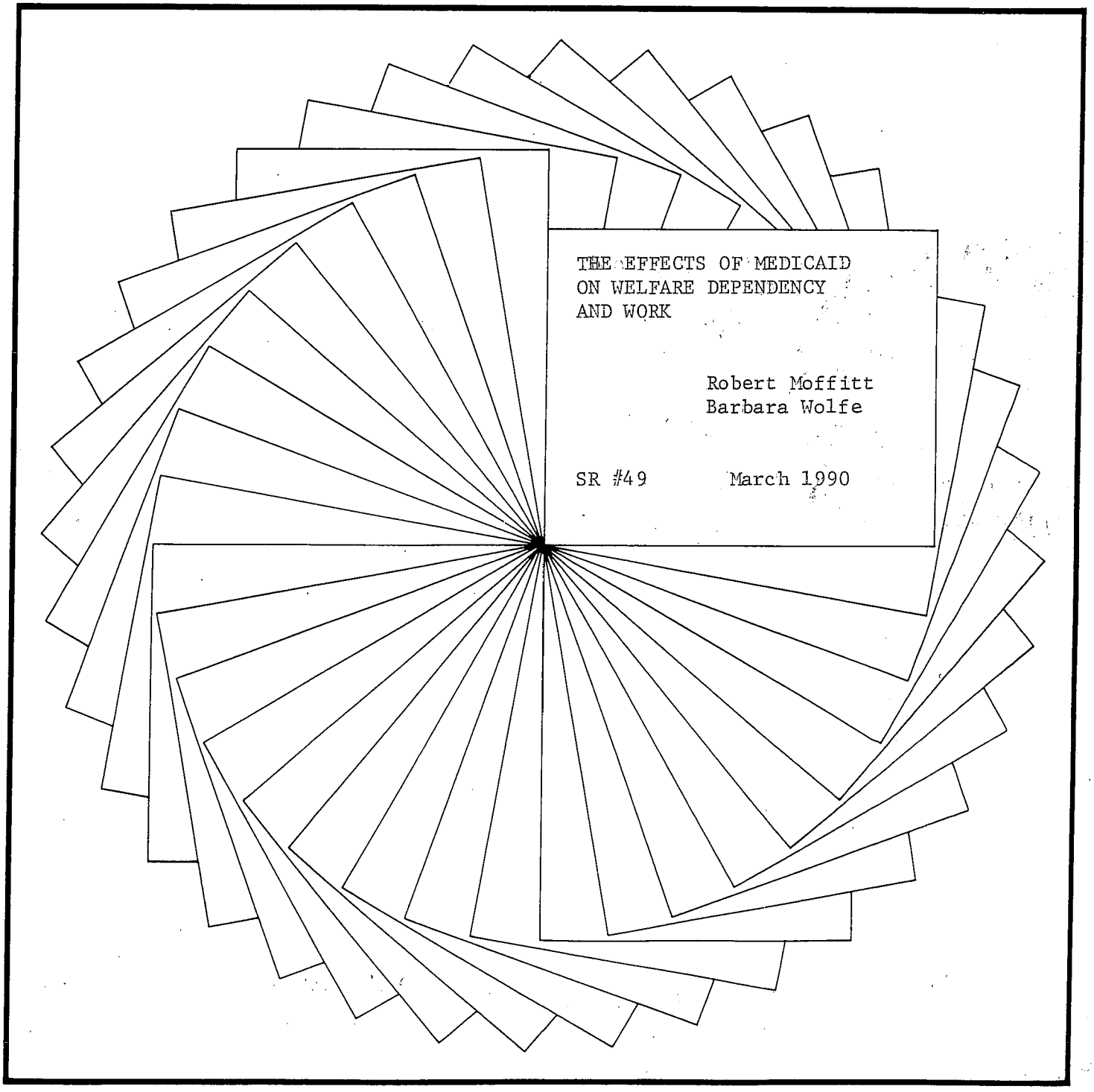

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The Effects of Medicaid on Welfare Dependency and Work

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Executive Summary

In the United States over the last twenty years, the provision of subsidized or free medical services to certain members of the low-income population has become a central component of the package of benefits for the poor. In 1988, 53 percent of all means-tested transfers were in the form of in-kind transfers. The Medicaid program, providing health coverage to the poor, accounted for 70 percent of those transfers. The major group eligible for Medicaid services consists of female-headed families on AFDC, for Medicaid eligibility is closely tied to AFDC eligibility even after recent expansions in Medicaid coverage. Because Medicaid is a substantial component of the package of benefits to such families, it has long been suspected that it may provide a strong incentive to enter the AFDC rolls or a disincentive against leaving the rolls. The study described here provides an empirical examination of this issue.

Using data from the Survey of Income and Program Participation, a survey of the U.S. population conducted by the Census Bureau from 1984 to 1986, the relation between AFDC recipiency and the Medicaid program is examined. The closely related issue of whether Medicaid discourages participation in the work force is also studied. Using data from the survey on health conditions and medical utilization of female heads of family and their children, an index of the importance of Medicaid to each family in the sample is developed. Families with high expected medical expenditures have a higher expected value for the Medicaid program than do families with low expected medical expenditures. Using

data from the survey on private health insurance coverage, indexes of the value of private coverage as well as the probability of private coverage are similarly constructed for each family in the sample.

The first finding from the study is that the suspected disincentives of the Medicaid program are strongly present:

- An increase in the level of expected Medicaid benefits to a family strongly increases its likelihood of being on AFDC and reduces the likelihood that the head will participate in the work force.
- The magnitudes of the effects are not small. A one-third increase in Medicaid benefits would increase the AFDC caseload by 6 percent and would reduce the percentage of female heads who work by more than 5 percentage points.

Nevertheless, closer examination of these effects for families with different levels of expected medical expenditures reveal that the effects do not appear for the majority of families:

- Only a minority of families are affected by the Medicaid program. Only the families with quite high expected medical expenditures respond to the program by staying on the AFDC rolls and failing to participate in the work force. Among a majority of female-headed families, the program does not appear to affect decisions.

The second set of findings from the study relates to the importance of private health insurance. Since most private insurance requires copayment, we find that the value of private coverage for those covered by private health insurance is lower than for Medicaid, even for families with the same health characteristics. We also find, as have many other studies, that private coverage is not universal among working female heads. Our examination of the effects of different levels of coverage and private health insurance benefit levels reveals strong incentive effects in the opposite direction to those of the Medicaid program:

- Higher levels of expected private health insurance benefits exert strong incentives to join the work force and to leave the AFDC rolls.

- The magnitude of the effects are much larger than those exerted by the Medicaid program. Increases in private insurance benefit levels have almost tripled the effects of Medicaid on the AFDC caseload and have more than doubled the effects of Medicaid on the likelihood of participating in the work force. Specifically, an increase in private health insurance equivalent to that for Medicaid would lower the AFDC caseload by 16 percent and raise employment probabilities by almost 12 percentage points.

The results also show that the extension of coverage in the working female-head population would have strong effects:

- Private health coverage for all working female heads would lower the AFDC caseload by 10 percent and would increase employment probabilities among female heads by almost 8 percentage points.

- If all female workers were covered by private insurance, an increase in the benefit level in private insurance plans to bring them up to Medicaid levels would reduce the AFDC caseload by one-fourth and would raise employment probabilities by 18 percentage points.

Acknowledgments

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I. INTRODUCTION

The provision of subsidized or free medical services to the low-income population has become a central component of the package of benefits for the poor in the United States over the last twenty years. Prior to 1965, when Congress enacted the Medicaid program, most benefits to the poor were provided in the form of cash payments, notably those provided in the Aid to Families with Dependent Children (AFDC) program and in the General Assistance (GA) program. However, since 1965 both the Medicaid program and the Food Stamp program, as well as the various housing programs for the poor, have grown in terms of caseloads and expenditures, and have grown in absolute size and relative to cash payments. In 1988, 53 percent of all federal means-tested transfers were in the form of in-kind payments; Medicaid accounted for 70 percent of those (U.S. House of Representatives, 1989, p. 1225).

The role of health-related programs has been particularly important in this expansion. The soaring price of medical care from the late 1960s through the 1980s and the associated growth in the percentage of GNP spent on medical care has made health care a leading domestic policy issue and has intensified debate on various forms of federal intervention in the health care market. One of the major issues in this debate is the low rate of private health insurance coverage in the low-income population. For example, from one-quarter to one-third of poor families in the United States are uninsured (Starr, 1986, p. 115). The majority of the uninsured are in the labor force or in a family with a labor force participant. In such a situation, the Medicaid program assumes an important role because it is the major program providing financing for health services to the low-income population.

This report investigates the effects of the Medicaid program on welfare dependency and work. As program caseloads and expenditures have grown and as Medicaid benefits have become a larger proportion of the total welfare package provided to low-income families, it becomes increasingly likely that families will be attracted to the welfare rolls because of the availability of such benefits. Since Medicaid benefits are provided primarily to AFDC recipients--non-AFDC female-headed families are sometimes eligible and some states offer Medically Needy benefits as well--families can often obtain Medicaid benefits only by enrolling in the AFDC program. This possibility is particularly strong when private health insurance coverage is difficult, less comprehensive, or very expensive for low-income families to obtain when off the welfare rolls. Thus, the problem is intrinsically and closely related to the problem of the uninsured among poor families. In addition, the lack of private health insurance provides families with an incentive to remain on the welfare rolls for long periods of time, possibly contributing to the high rates of welfare dependency that have been increasingly recognized of late.

A related issue concerns the effects of Medicaid on work effort among the low-income population. If the lack of private health insurance coverage when off the welfare rolls and the provision of Medicaid only when on the rolls leads to increased reliance on AFDC, there is a danger that the well-known work disincentives of AFDC will be heightened. In particular, since AFDC recipients historically have lost eligibility for Medicaid benefits when leaving AFDC--for example, by obtaining a job with sufficiently high earnings--an extra work

disincentive is provided. The problem of the Medicaid "notch," as it is generally termed, is related to this issue because recipients face, effectively, tax rates in excess of 100 percent at the point where their earnings rise just above the eligibility point--an extra dollar of earnings can lead to a reduction in effective consumption because all Medicaid benefits are lost.

There has been significant policy movement in the last few years designed to address this issue, most of which has been intended to allow AFDC recipients to continue to receive Medicaid benefits for some period after leaving the rolls. Since the late 1970s, for example, AFDC recipients who lose eligibility because of increased earnings are entitled to retain Medicaid eligibility for 4 months. In addition, since 1984 AFDC recipients who lose eligibility as a result of the earnings-related changes in the 1981 Omnibus Budget Reconciliation Act (OBRA) are entitled to retain Medicaid eligibility for at least 9 months and possibly more at state option. Most important, the Family Support Act of 1988 requires states, by the spring of 1990, to allow recipients losing eligibility for either reason to retain benefits for 12 months, although there may be an income-related premium charged for the second 6-month period.

The research conducted for this report is designed to provide evidence of the effects of Medicaid on welfare dependency and work among single mothers. Despite the importance of the question there has been relatively little research on this issue, and far less research than has been conducted on other programs such as AFDC and Food Stamps. In our work we use the Survey of Income and Program Participation (SIPP) to

analyze the issue. We first use a single wave of this survey in 1986 to determine the extent to which Medicaid leads to increased participation in the AFDC program and lower levels of work among female heads of family, the primary eligibility group for AFDC. Second, we use two waves of the survey, one in 1984 and one in 1986, to analyze the extent to which Medicaid benefits decrease the movement of female-headed families off AFDC and into the work force and increase such movement onto AFDC and out of the work force.

A major goal in the analysis is to measure as accurately as possible the attractiveness of Medicaid benefits to different families. Our aim in this regard is to recognize that Medicaid should be of much more importance to families with health problems and high expected medical expenditures than to other families, and that we should not be surprised if those families which need medical care the most are more affected by the incentives in the program than others. To this end we construct what we term a Medicaid "heterogeneity" index to measure the differences across families--the heterogeneity--of expected medical expenditures. We then determine whether families with higher levels of this variable are more attracted to AFDC than other families. In addition, we follow the same procedure for private health insurance by constructing a variable for the probability of receiving private health insurance if off the AFDC rolls and the expected value of family medical expenditures if covered by such insurance.

The outline of the report is as follows. In Section II the Medicaid program is reviewed and the research literature on the effects of Medicaid on welfare dependency and work is reviewed. In Section III

we discuss the theoretical effects of the Medicaid program on welfare dependency and work effort. We discuss the data set we will use and the overall plan of analysis in Section IV and the results of our construction of the heterogeneity indexes in Section V. The results of the static analysis (one SIPP wave) and of the dynamic analysis (two SIPP waves) are presented in Sections VI and VII, respectively. A summary is provided in Section VIII.

II. BACKGROUND AND REVIEW OF PRIOR RESEARCH

A. The Medicaid Program

The Medicaid program provides health care for certain low-income families in the U.S. Authorized under Title XIX of the Social Security Act, the program provides benefits to the aged, blind, disabled, families with dependent children, and certain other pregnant women and children. The most important characteristic of the program is that eligibility is closely tied to actual or potential receipt of cash transfers, in most cases AFDC or Supplemental Security Income (SSI). However, there are some exceptions to this connection. Eligibility has also been extended to a wide variety of other groups, particularly in the last few years, including pregnant women and children whose income and resources exceed those of the state AFDC programs, some children under the age of 7 in low-income families not receiving AFDC, and some individuals under the age of 21 who would be eligible for AFDC if they met the family status provisions (i.e., those living in two-parent families).

Eligibility for benefits can also be retained by former AFDC families if they qualify under one of the transitional rules. Since the late 1970s families who were on AFDC for 3 of the last 6 months and who lose eligibility for benefits because of increased earnings or hours of work (or increased child support) have been entitled to retain eligibility for Medicaid benefits for 4 months after leaving the AFDC rolls. In addition, 1984 Congressional legislation permitted recipients who had been made ineligible for benefits by the 1981 legislative removal of the AFDC earnings disregards (which had deducted the first $30 and thereafter one-third of recipients' earnings, permitting them to keep the rest) to retain Medicaid eligibility for 9 months. Congress also allowed states to add, at their option, up to 6 months of eligibility on top of this. As of early 1987, 13 states had done so. Finally, it should be noted that the Family Support Act of 1988 requires states to allow AFDC recipients who lose eligibility for either earnings-related reasons or loss of disregards to retain eligibility for 12 months. The legislation, scheduled to take effect in April of 1990, also permits states to charge income-related premia and to experiment with the service provision in other ways for the second 6 months of the period.

Table 1 shows several historical trends in the program. The total caseload has been essentially static for the last 15 years, after an enormous growth in its first 10 years (1965-1975). Female heads and their children constitute about two-thirds of the caseload, and although this percentage has grown slightly since 1974, it has not changed dramatically. The majority of the remaining recipients are the aged and

Table 1

Historical Trends in the Medicaid Program

Year	Unduplicated No. Medicaid Recipients (thousands) Total (1)	Female Heads and Children (2)	Percent (2)/(1)	Average Monthly AFDC Recipients (thousands) (4)	Medicaid-AFDC Percent (2)/(4)	Real Federal and State Expenditures (millions)[a] (5)
1974	21,462	13,870	64.6	10,845	128	18,104
1976	22,815	14,698	64.4	11,330	130	22,917
1978	21,965	14,019	63.8	10,663	131	26,465
1980	21,605	14,210	65.8	10,597	134	29,770
1982	21,603	14,919	69.1	10,431	143	32,446
1984	21,607	15,284	70.7	10,866	141	34,779
1986	22,515	15,676	69.6	10,995	143	39,240

Source: U.S. House of Representatives (1989, pp. 559, 1139-1141).

[a]1982 dollars.

the disabled, who constitute a much larger percentage of expenditures because of the high cost of their medical treatments and nursing home care. The AFDC caseload, shown in Table 1, has also remained static since 1974. However, the ratio of female-head Medicaid recipients to AFDC recipients has grown somewhat, no doubt reflecting the extensions of eligibility to non-AFDC female heads referred to above.[1]

Table 1 also shows the growth rate of real expenditures in the program, which has been enormous. Between 1974 and 1986, expenditures grew by over 100 percent, reflecting the surge in the cost of medical care in the United States.

Eligibles in the Medicaid program are generally classified according to whether they are categorically needy or medically needy and, if the former, whether their eligibility is based upon receipt of cash assistance or not. Sometimes the categorically needy are also subclassified by whether their eligibility is mandatory or optional on the part of the states. In any case, the categorically needy are those made eligible by their family composition or structure, or eligibility for AFDC or SSI. The medically needy are those who incur large medical bills and who meet all criteria for categorically needy assistance except for income. To be eligible for benefits, their income and resources may be above the state categorically needy standard but must be below a state-defined need level, which can be no more than 133.33 percent of the maximum AFDC payment for a similar-sized family. Since eligibility for the medically needy program requires that income after medical expenses fall below the standard, families must "spend down" their income in order to gain eligibility. In 1987, 39 states had a

medically needy program in place covering some or all of the "categorical" groups. The spend-down period, or the accounting period to determine eligibility, varies from 1 to 12 months across states.

Table 2 shows the distribution of Medicaid payments across different types of eligibility category for female heads under age 65 in 1987. The table shows clearly the continuing importance of the connection to AFDC, for almost 80 percent of all expenditures go to such families. The remaining expenditures are roughly equally divided between those going to recipients of medically needy benefits and recipients who are categorically needy but not receiving AFDC or other cash assistance. Thus the latter two categories are by far the exception rather than the rule. Furthermore, in 1986, 92 percent of Medicaid recipients who were not aged, blind, or disabled were AFDC recipients.

Table 3 shows a simple description of the relation between Medicaid coverage and receipt of AFDC benefits in the SIPP sample (analyzed below). For present purposes, it is only necessary to note that the data constitute a random sample of 550 female heads from the U.S. population, all of whom have at least one child under 18 and who were interviewed in the Spring of 1986. As the table shows, there are no families on AFDC not covered by Medicaid, as should be expected. A little over half of all female heads (58 percent) are neither on AFDC nor are covered by Medicaid and about one-third (33.6 percent) receive AFDC and are therefore covered by Medicaid. The remaining 8.4 percent are non-AFDC families covered by Medicaid, which include the non-AFDC categorically needy, the medically needy, and families receiving

Table 2

Medicaid Payments for Female Family Heads and Children, 1987

	Total	Percentage Distribution
Categorically needy		
With cash assistance	$8,848,000	79.4
Without cash assistance	899,000	8.1
Medically needy	1,390,000	12.5

Source: U.S. House of Representatives (1989, p. 1145).

Table 3

Percentage Distribution of Female-Headed Families with Children under 18, 1986, by Program Participation Status

	Off AFDC	On AFDC
Not covered by Medicaid	58.0	0.0
Covered by Medicaid	8.4	33.6

Source: Survey of Income and Program Participation (see Section IV). Data apply to the month preceding the Wave 9 SIPP interview.

transitional benefits. The data do not allow us to distinguish between these categories.

The major conclusion to be drawn from this review of the program and the associated tables is that Medicaid recipiency for female heads is still so closely tied to AFDC that female heads remain faced with what is essentially a two-fold choice, to be on AFDC with Medicaid coverage or to be off AFDC without it. Transitional coverage is just that--coverage for a limited period of time. Table 2 shows that the vast majority of program expenditures goes toward AFDC families and very little toward the other groups, implying that an AFDC family cannot have a reasonable expectation of long-term support under either the Medically Needy program, which is by and large only catastrophic coverage in any case, or under the various categorically needy provisions for those without cash assistance. Table 3 shows as well that only a small fraction of all non-AFDC female heads are covered by Medicaid in a given month.

To be sure, the transition rules currently in effect provide temporary extension of coverage. However, the available program statistics indicate that the number of families receiving 9-month transitional benefits is extremely small and that almost four-fifths of recipients of such benefits are eligible only under the 4-month provisions. Perhaps more important, it is known from prior work (e.g., Bane and Ellwood, 1983) that most female heads lose eligibility for AFDC through marriage or the loss of demographic eligibility rather than increased earnings, which generally will also imply a loss of Medicaid eligibility.

B. Prior Research

The issue addressed in this report is the extent to which the Medicaid program affects the probability of being on AFDC and also the level of work effort of female heads. There has been a tremendous amount of economic research studying the effect of AFDC benefits themselves on both of these outcome measures (see Moffitt, 1987, for a review), though more on the latter than on the former. Studies of the effect of AFDC benefits on program participation divide up into those which study the static determinants of participation at a point in time in a cross-sectional sample of female heads, and those which examine the effects of the program on turnover in AFDC and the lengths of welfare spells. The larger number of studies of work effort effects has arisen because the work disincentives of welfare in general and AFDC in particular have been one of the main objects of economic research on the welfare system. There have also been a much smaller number of studies of the Food Stamp program, although here there are quite a few more addressing participation-related issues than labor supply issues.

In any case, the opposite is the case for the Medicaid program, for which there have been only two econometric studies of effects on AFDC participation and employment (Blank, 1989; Winkler, 1989). To be sure, Medicaid has been extensively discussed in the research literature, although mostly in terms of the effects of the Medicaid notch. However, the notch problem is logically separable from the more general question of the effects of Medicaid on AFDC participation and work effort; that is, the two can be studied separately. The latter is studied empirically by Blank but not the former. Hence, despite the extensively

discussed problem of the Medicaid notch, there have been no studies of its effects on either AFDC participation or work effort. Our efforts to study this issue, reported below, will indicate some of the difficulties that are encountered in addressing it.

Blank used the 1980 National Medical Care Utilization and Expenditure Survey (NMCUES) to study the effect of Medicaid on AFDC participation. The NMCUES contains information on both AFDC receipt as well as a variety of health measures. To develop a measure of the level of Medicaid benefits, Blank used information from Smeeding (1982) to construct a state-specific mean Medicaid insurance value for a family of four. The insurance values of Smeeding were calculated by dividing state Medicaid expenditures for different groups by their numbers on the AFDC rolls. Blank entered this state-specific measure into a probit equation for AFDC participation, along with a number of other sociodemographic and health variables. The coefficient on the Medicaid variable was highly insignificant, implying that Medicaid has no appreciable effect on the probability of participating in the AFDC rolls (the AFDC and Food Stamp benefits had significantly positive effects, however). Blank also tested in her equations a variable for the income eligibility level in the Medically Needy program, and found its coefficient to be likewise insignificant. Thus the study found no evidence of Medicaid effects.[2]

Winkler used the 1986 Current Population Survey (CPS) for her analysis of the effect of Medicaid on work effort. She did not examine AFDC participation. Her Medicaid variable was closely related to that of Blank, for Winkler constructed a state-specific average Medicaid

expenditure variable derived from published aggregate statistics on Medicaid expenditure for AFDC families. Using female heads in the CPS, Winkler found that the Medicaid benefit had a negative and significant effect on employment status. Thus her results are not consistent with those of Blank. The differences could arise from a number of sources, such as the differences in samples used by Blank and by Winkler. To date, the difference is not resolved.

Aside from estimating a similar model on different data, our report will also examine whether the results of Blank and Winkler are likely to have been affected by the crudeness of the Medicaid benefit variable used, which is the same one used by almost all prior analysts in other contexts. We hypothesize that different families are affected by the Medicaid program in different ways, depending upon the level of medical need of the family. Therefore, rather than use a state-specific average, which is unlikely to be an accurate measure of benefits for most recipients in the state, we construct a family-specific index of expected medical expenditures to capture the across-family heterogeneity in the probable response to the Medicaid program. We report the results of using this variable below.

III. THE THEORETICAL EFFECTS OF MEDICAID, THE MEDICAID NOTCH, AND THE MEDICAID TRANSITIONAL RULES ON AFDC PARTICIPATION AND WORK EFFORT

The best framework for analyzing the effects of Medicaid on AFDC participation and work effort is the standard static labor supply model of economics. In that model, means-tested transfers of all types provide incentives to collect benefits and to reduce work effort. This

basic hypothesis has been tested in many studies of the AFDC and Food Stamp programs, and the evidence is strongly consistent with the hypothesis (Moffitt, 1987). For AFDC participation in particular, the studies show quite uniformly that higher benefits lead to greater AFDC participation rates. The same theoretical effects should be expected for the Medicaid program; it is means-tested, and provides benefits only to families with low income and resources, hence, similar incentives are produced. As noted in the last section, the one study examining its effect did not find support for the theory, for Medicaid was found to have no significant effect on AFDC participation.

A different issue that has not been addressed is whether Medicaid benefits have the same or different effects than AFDC benefits. This issue is of some interest because, as noted in the Introduction, Medicaid benefits have grown drastically relative to AFDC benefits over the last 15 years. On the one hand, there is evidence from Smeeding (1982) and others indicating that recipients do not value a dollar of Medicaid benefits as highly as a dollar of cash benefits, for the former must be spent on medical care whereas the latter may be spent on other goods as well. Hence one might expect Medicaid benefits to have a smaller effect than regular AFDC benefits. On the other hand, to the extent that families value insurance at a value greater than actual expenditures, the more likely it is that Medicaid benefits would have a greater effect on AFDC participation rates than cash benefits. We will provide some evidence on this issue in our empirical work.

The most frequently-discussed issue in the theoretical literature on the Medicaid program is that of the Medicaid notch and its presumed

work disincentive effects. However, a simple analysis of the notch problem indicates that no work disincentives need necessarily arise. In fact, the notch could provide work incentives, in principle. This can be seen in Figure 1(a), which shows several different budget constraints for a female head. Line ABD shows the relation between earnings and take-home income if the woman is not on AFDC and has no private health insurance. Line AJ shows a hypothetical constraint that would arise if she were able to obtain private health insurance when off AFDC under the assumption that such insurance equals a fixed proportion of earnings (many private plans provide greater benefits to those with higher earnings). An alternative assumption is that such insurance is the same at all earnings levels, but this would not alter the example significantly. Line EB shows the constraint available to a woman on AFDC who receives the maximum payment (guarantee) of P, assuming the benefit-reduction rate is less than 100 percent.[3] Finally, line FG shows the constraint that would arise if the cash equivalent value of Medicaid benefits were added on. AFDC benefits are terminated at points B and G.

Work disincentives arise from the Medicaid "notch" at point G because an additional dollar of earnings results in a significant drop in income. However, the elimination of the notch could generate work disincentives as well, as illustrated in Figure 1(b). Elimination of the notch would require extending segment FG upward to the right, as shown by the dotted line. In practice, this could be effected by allowing families with income above the AFDC breakeven point to retain Medicaid eligibility but by paying a premium positively related to

Figure 1

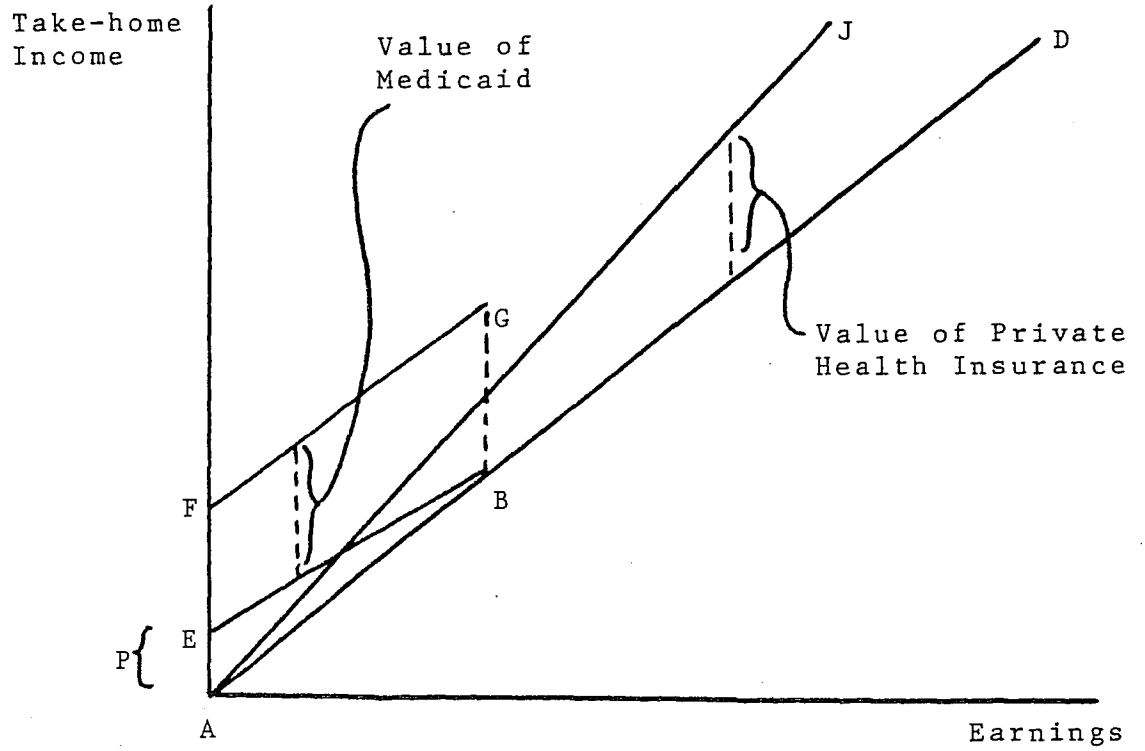

Figure 1(a). Effect of Medicaid on Budget Constraint.

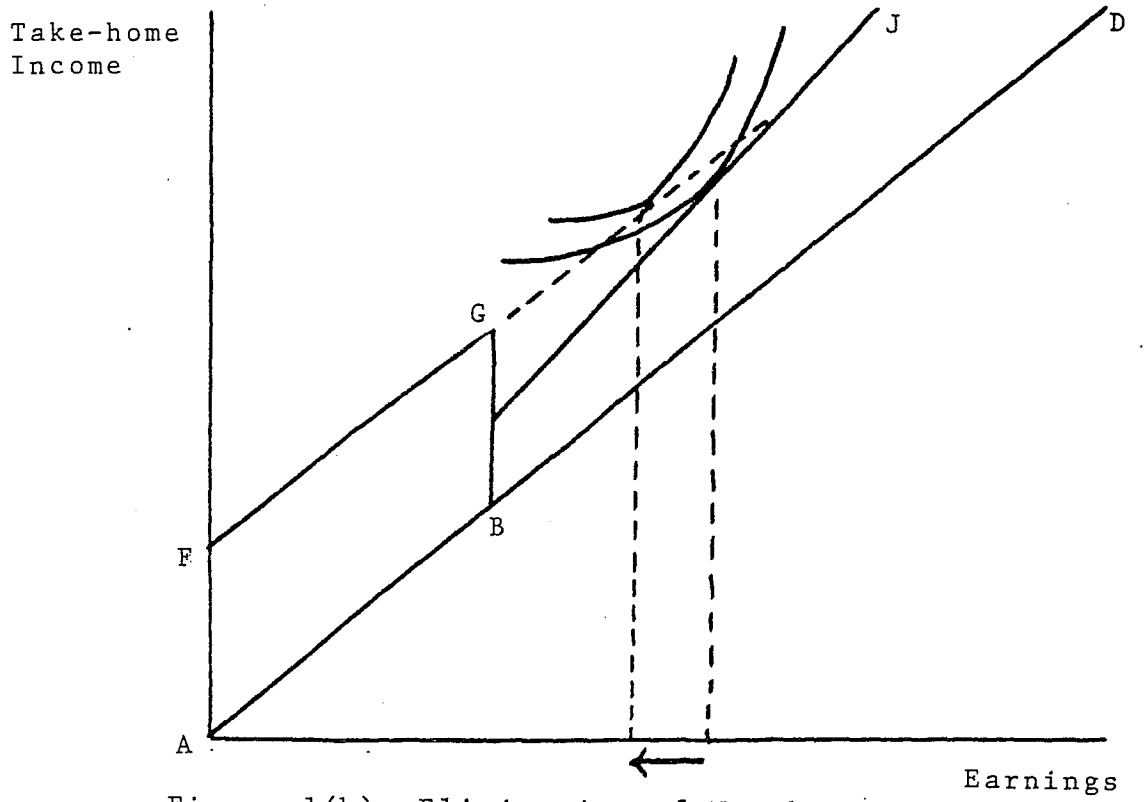

Figure 1(b). Elimination of Notch Decreases Earnings.

income. Some women would be induced to leave the AFDC rolls and work while paying the income-related premium for Medicaid. However, as shown by the hypothetical indifference curves in Figure 1(b), some women may choose to enter the AFDC rolls to obtain Medicaid benefits, and such women would face work disincentives if they did so. Thus the provision of Medicaid benefits to women with higher earnings and income than had been possible before the new provision induces some women who were not initially on the AFDC rolls to come onto the rolls. The net effect of elimination of the notch is, therefore, ambiguous in theoretical terms and can only be resolved empirically.[4]

It may be thought that one method of preventing new workers coming onto the rolls would be to allow Medicaid benefits above the breakeven point to be received only if the woman was initially on the AFDC rolls; those off the rolls could not come on for that purpose. This policy is, in fact, exactly that followed by the Medicaid transitional rules currently in effect and those which will be implemented following the Family Support Act; that is, transitional benefits are only available to women who have been on the rolls for some minimum length of time. Unfortunately, the countereffect cannot be eliminated because women considering newly applying for AFDC may be aware--or cannot be prevented from being aware--of the potential for transitional benefits should they later leave the rolls, even if they had not planned on enrolling for that purpose. Consequently, the availability of such benefits must in principle have some positive effect on the likelihood of applying for benefits. Of course, the magnitude of the effect may be trivial or large, and only empirical analysis can resolve the issue and thereby

determine its practical importance. Note that these effects apply to the AFDC caseload as well as to work effort levels--transitional benefits have a priori ambiguous effects on both.

IV. OVERVIEW OF DATA AND ANALYSIS PLAN

The data we use for the analysis are drawn from the 1984 panel of the Survey of Income and Program Participation (SIPP). The 1984 SIPP panel began in October 1983 by interviewing a nationally representative sample of the civilian noninstitutional population of approximately twenty thousand households. The sample was divided into four rotation groups, each of which was interviewed every 4 months thereafter until July 1986, the last interview month. At each interview respondents were asked retrospective questions covering information for each month since the last interview, so that in principle a fairly long monthly time series of information could be obtained.

Aside from its monthly nature, the primary advantages of SIPP for our purposes are that it was designed to collect detailed information on program recipiency, and it contained a special set of questions on health status and medical utilization. The collection of data on program recipiency is important because it allows us to determine whether the family was or was not receiving AFDC, Food Stamps, and whether they were covered by the Medicaid program or by private health insurance (all were asked in every interview). The health-status data allow us to construct a family-specific medical heterogeneity index, which is a main feature of our analysis.

Our analysis will proceed in three sequential steps. In the first, detailed in the next section of this report, we will use the health information to construct a medical heterogeneity index. The health information was collected from a set of special questions administered in the first SIPP topical module, which took place in the third wave of interviewing from May to August of 1984. A series of questions were asked of all families and individuals, including information not only on health status but also medical utilization in the form of inpatient and outpatient days over the prior 12-month period. Using these data along with information obtained from the NMCUES as described in the next section, a variable representing expected medical expenditures is constructed. Separate values are calculated for expected expenditures if the family is covered under Medicaid and if the family is covered under private health insurance. As part of the analysis, a variable is also constructed for the probability of receiving private health insurance if employed, and this probability is multiplied by the private health insurance expenditure variable to obtain a new variable taking into account the probability of coverage.

In the second step of the analysis, reported in the subsequent section, a single cross section of the SIPP is analyzed using the heterogeneity indexes. For this purpose a sample from the ninth wave of the SIPP, administered from April to July of 1986, is drawn. The ninth wave was chosen because it is the latest wave of the SIPP and therefore provides the most recent and presumably most policy-relevant data. Using all female heads with children under the age of 18 in the sample, equations for the probability of AFDC receipt and for the probability of

employment are estimated, including as regressors the Medicaid and private health insurance heterogeneity variables, among others. Attempts to estimate the effects of the Medicaid notch are also reported in this section.

The third step in the analysis, reported in the subsequent section, is based upon an analysis of the ninth wave of SIPP in conjunction with the interviews of the same families 2 years prior, in April to July of 1984. These two samples are then used to estimate the determinants of moving onto or off of the AFDC rolls, and onto or out of the work force between the two periods. As regressors we once more enter the Medicaid and private health insurance heterogeneity variables to determine their effects.

The results of the analysis are then summarized in the final section.

V. CONSTRUCTION OF THE HETEROGENEITY INDEXES

A. Background

Valuing in-kind benefits such as those for medical care, food, and pensions is a difficult task. Many problems arise even in the valuation of medical benefits in the private sector, much less the public sector. For example, in the private sector most medical benefits are provided through the work place and are valued differently than on the open market for individual purchase because of differences in tax treatment, risk pooling, overhead, and coverage options.

In the case of public coverage, the valuation task is even more difficult because recipients do not pay for coverage. Three methods for valuing such coverage, especially medical coverage, have been suggested (Smeeding and Moon, 1980). The first, and most common, is the method of "government cost." Here a value of Medicaid benefits, for example, is obtained by dividing government expenditures, including administrative costs, by the number of recipients. This method overvalues benefits because it fails to address their in-kind nature--that is, the recipients cannot sell the coverage--and for other reasons. A variant of this method divides expenditures by the number of eligibles rather than the number of users, for presumably even nonrecipient eligibles receive an implicit insurance benefit from the program. The second method calculates a cash-equivalent value of in-kind care by assuming a particular utility function and then imputing to broad groups of individuals--by income, for example--an average willingness-to-pay amount. The second method is most preferable but requires estimation of the parameters of the utility function, a difficult task. The third method values in-kind benefits by the amount of funds released for the purchase of other goods should the in-kind program be eliminated, and undervalues such benefits.

In our work we do not follow any of these three approaches and do not attempt to calculate an insurance value per se. Our main object is to address a major difficulty with all three approaches, which is their use of average values over large groups to calculate benefit values. While none of the approaches requires such large-group averages in theory, the available data require such averaging. In the first method,

statistics for Medicaid expenditures are only available by state and sometimes for the aged and nonaged, and in the second and third methods, values can be generally calculated for only two or so demographic characteristics. The values so obtained miss many important interfamily differences that affect valuations--health status, the number of persons covered, expected utilization of medical care, the cost of medical care in the community (and to those with particular forms of coverage), and intensity of coverage.[5] For the AFDC population, with which we are concerned, these differences are particularly important. Recipients of AFDC are often high users of medical care because their health status is lower than that of the nonpoor (Kaspar, 1986). For example, of children less than 6, 26.4 percent of those covered by Medicaid report only poor or fair health levels compared to 16.2 percent of the nonpoor (among adults the respective percentages are 27.1 and 6). This is also important if one is to compare the behavior of those with private health insurance, who are generally not on AFDC, to the behavior of AFDC Medicaid recipients. Within the AFDC population, those with relatively good health levels are, of course, likely to value Medicaid less highly than others.

The SIPP data allow us to take such differences into account because information is provided on health status, utilization of medical care, Medicaid and private health insurance coverage, and many economic and demographic characteristics of the family. Using this information we can construct with regression methods an "expected" level of utilization of medical care under Medicaid for a family with a given set of health and other characteristics. In conjunction with outside

information on prices of care, we can translate this family-specific value of expected utilization into a value of expected expenditure. This Medicaid "heterogeneity" index will be the primary variable we use in our analysis of welfare dependency and work effort.

It should be stressed that this index is not equal to an insurance value for many reasons. It does not include loading factors and other administrative costs; it does not represent an attempt to gauge the open-market price of the bundle of services provided by Medicaid; and it does not attempt to gauge the cash-equivalent value of the care. Among the three traditional methods of valuation mentioned above, it comes closest to the method of government cost using eligibles as the population base; nevertheless, there are important conceptual differences between that measure and ours as well. Our measure should be thought of as a proxy for the true value of Medicaid benefits, a proxy that should be highly positively correlated with that true value. Because it captures interfamily heterogeneity to such a greater extent than have past measures, we believe that it is a better proxy than those measures.[6]

We also construct a similar family-specific index for the value of private health insurance. This index combines the probability of being covered by such insurance if working with the expected medical expenditure of the family if so covered. This private health insurance heterogeneity value will also differ by family characteristics.

B. Design of the Variables

Data. The major data set we employ is Wave 3 of the 1984 panel of the Survey of Income and Program Participation (SIPP), as discussed previously. In conjunction with it we employ data from the 1980 National Medical Care Utilization and Expenditure Survey (NMCUES) survey, which has better information on medical expenditures than SIPP. The NMCUES is used to provide estimates of medical expenditures for children and to convert the SIPP utilization measures into values of Medicaid and private insurance expenditures (see below). Finally, we also use certain state variables from published sources, including medical supply (beds per 1000, physicians per 1000, hospital occupancy rates), relative cost (average per diem cost for a hospital day), and welfare program characteristics (whether state has a medically needy program and the AFDC basic needs standard for a family of four).

We employ several different components of Wave 3 of the SIPP. We use the Wave 3 topical module Part B, administered in the late spring and summer of 1984 to all four rotation groups, to obtain information on health status and medical usage. As described in detail below, we use the information in this module to estimate a family-specific Medicaid index. Second, we use the core data and the topical modules to obtain work and welfare histories, respectively, in order to construct right-hand-side variables for the analysis.

NMCUES is based on interviews of 6000 randomly selected households who were interviewed five times at approximately 3-month intervals during 1980-81 to obtain information on health, use of medical services,

charges and sources of payment for services and health insurance coverage. We use single mothers with at least one child under 18 and their children as our sample. They number 554 and 1033 respectively.

From the SIPP Wave 3 we draw our main sample, including all single mothers with children under 18. The sample includes 1701 mothers and 3016 children. Of the mothers, 644 are on Medicaid from 1 to 4 months over the 4 months (January to July 1984, depending on the rotation group), while 520 are on AFDC from 1 to 4 months during the same period. Tables 4 and 5 provide more information on the SIPP sample, describing the variables, and their means and standard deviations, for mothers and children. Appendix Tables A-1 and A-2 do the same for the NMCUES data. The NMCUES data set is defined to include the same subpopulation as SIPP--single mothers and their children under 18. Several variables are included in the tables to allow comparison of the samples. These means suggest that the samples are similar in regard to mean age of the mother (33), proportion white (.6), proportion head of household (.8), proportion divorced-widowed (.5), and proportion never married (.2-.3). The SIPP sample has a somewhat higher percentage on Medicaid (.4 vs. .32) than the NMCUES data. In general the samples appear quite similar.

The SIPP data from the third wave contain an extensive battery of health information, as well as data on the number of outpatient and inpatient days of the female head over a 12-month period. We initially stratify the sample into the uninsured, those covered by private health insurance, and those covered by Medicaid, as of the fourth month, and estimate a multinomial logit regression for the type of coverage with an equation of the following type:

Table 4

Variable Definitions and Means
SIPP Data
Mothers
N-1701

Variable	Definition	Mean	Standard Deviation
Dependent Variables			
Nights	Nights in hospital in last 12 months (inpatient utilization)	1.4	5.0
Visits	Outpatient visits in last 12 months (outpatient utilization)	4.5	9.0
Medicaid	1 = Covered by Medicaid	0.4	0.5
Private	1 = Covered by private insurance	0.5	0.5
Family coverage	1 = Family covered by private health insurance	0.3	0.5
Individual coverage	1 = Individual covered by private health ins.	0.1	0.3
Health Variables			
Needs help	Needs help--housework	0	0.1
Poor or fair health	1 = poor or fair health	0.5	0.5
Socioeconomic Variables			
Mean income	Mean personal income	830.7	744.3
Coeff. of variation	Coefficient of variation of mean personal income	0.1	0.1
Relative income	Family income divided by poverty line	3.0	2.8
Income ratio	Ratio of mean personal income to mean household income	0.7	0.3
One employer	1 = one job	0.5	0.5
Gov. employee	1 = government worker	0.1	0.3
Age	Age	32.8	9.1
Education	Years of education	11.9	2.6
Training	1 = Ever in vocational training program	0.3	0.4
No. kids < 18	No. kids less than 18	1.8	1.0
Disabled child	1 = disabled child	0.1	0.3
Own home	1 = owns home	0.4	0.5
Rents home	1 = rents home	0.6	0.5
Divorced-widowed	1 = divorced or widowed	0.5	0.5
Never married	1 = never married	0.3	0.4
Child support	1 = receives child support	0.3	0.4

- Table, Continued -

Table 4, Continued

Variable	Definition	Mean	Standard Deviation
White	1 = white	0.6	0.5
Head	1 = head	0.8	0.4
Manufacturing	1 = works in manufacturing	0.1	0.3
Sales	1 = works in wholesale or retail sales	0.1	0.3
Personal services	1 = works in personal services	0.0	0.2
Finance-business	1 = works in professional or related services	0.1	0.3
State Variables - 1984			
Health expends.	Per capita expends. on health	1215.9	192.1
Average cost/day-hosp.	Average per diem cost-hospital	418.7	78.9
Has Med. Needy prog.	1 = has medically needy program	0.2	2.2
AFDC benefit	AFDC Basic Needs, 4 persons, over maximum AFDC Benefit in U.S.	0.6	0.2
Regions			
Northeast	1 = Northeast	0.2	0.4
Midwest	1 = Midwest	0.3	0.4
South	1 = South	0.4	0.5
West	1 = West	0.2	0.4

Table 5

Variable Definitions and Means
SIPP Data

Children
(N=3016)

Variable	Mean	Standard Deviation
Age of child	8.8	5.2
Medicaid = 1 for child	0.4	0.5
Private = 1 for child	0.5	0.5
Disabled = 1	0.1	0.2
White = 1	0.6	0.5
Child lives below poverty = 1	0.5	0.5
Age of mother	33.0	8.2
No. children < 18	2.4	1.4
Family income/poverty line	2.8	2.7

$$L = X\beta + Z\delta + S\xi + \epsilon \tag{1}$$

where L is a dummy variable for type of medical care coverage (Medicaid, private, or none); X is a vector of health characteristics; Z is a vector of other variables, including individual characteristics such as education, number of children, age, headship, marital status, income, home ownership, and race; and S is a vector of state variables, including Medicaid variables such as AFDC basic needs level for a family of four, relative AFDC basic needs level, presence of a medically needy program, and state variables such as per capita health expenditures. We use the estimates of this equation to create instrumental (i.e., predicted) variables for the probability of medical insurance coverage, $\hat{L}_1$(Medicaid) and $\hat{L}_2$(private health insurance). We use these variables to estimate equations for the two measures of utilization we have for the mother:

$$I_1 = X\beta_1 + Z\delta_1 + S\xi_1 + \hat{L_1}\gamma_1 + \hat{L_2}\phi_1 + \epsilon_1 \tag{2}$$

$$I_2 = X\beta_2 + Z\delta_2 + S\xi_2 + \hat{L_1}\gamma_2 + \hat{L_2}\phi_2 + \epsilon_2 \tag{3}$$

where I_1 is her number of inpatient days (nights in hospital), I_2 is her number of outpatient days (outpatient visits), X is the same as in equation (1), and Z is a subset of Z in equation (1) as is the S vector.

The NMCUES data are then used to convert utilization into expenditures. The NMCUES contains information on medical expenditures over calendar year 1980, which we group into three types of medical care: expenditures for inpatient care (hospital stays), outpatient care, and other medical care. The expenditure variable obtainable from

NMCUES is total medical charges incurred minus out-of-pocket costs.[7] Using these three expenditure variables for each NMCUES observation, plus NMCUES data on utilization (hospital nights, outpatient visits, etc., over the year), we estimate the following three "value" equations:

$$V_1 = a_1 I_1 + b_{11} L_1 + b_{12} L_2 + c_1 S \quad (4)$$

$$V_2 = a_2 I_2 + b_{21} L_1 + b_{22} L_2 + c_2 S \quad (5)$$

$$V_3 = a_3 I_1 + a_4 I_2 + b_{31} L_1 + b_{32} L_2 + c_3 S \quad (6)$$

where V_1 is a value of inpatient care, V_2 is a value of outpatient care, and V_3 is a value of other medical care. Expenditures of each type are thus assumed to be affected by actual utilization (I_1 and I_2--both are entered for V_3), the type of coverage (L)--included to capture the influence of insurance coverage on value of care via the coinsurance rates for inpatient and outpatient care, respectively, as well as differential charges to Medicaid, private, and uninsured patients--and S, regional variables included to reflect differential prices by region.

Using the results from the estimation of equations (4)-(6), a "total" value amount is predicted for each mother by inserting her predicted values of I_1 and I_2 into equations (4)-(6) and by summing the resulting predicted values of $\hat{V}_1$, $\hat{V}_2$, and $\hat{V}_3$. A separate calculation is performed setting $L_1 = 1$ and then $L_2 = 1$ in both (2)-(3) and (4)-(6), thereby permitting us to obtain an "expected" total value of Medicaid and private insurance, respectively, for each mother. These two total values will be the major variables in the econometric analyses reported in subsequent chapters.

An advantage to each index, in addition to its capturing individual heterogeneity, is that it predicts a positive value even for those who happen not to have had care in the last 12 months (those eligible but not current recipients). It is undesirable to assume that a woman with no utilization in the last 12 months assigns zero value to health insurance; our index assigns her an expected value dependent upon her characteristics. Another advantage is that the index is a function of state Medicaid and supply characteristics, and so will be partly state-specific and partly individual-specific.

For the children, no utilization data are available in SIPP, although information is provided on whether the children are covered by private health insurance or Medicaid. For children, we use NMCUES data on children of single mothers to directly estimate the value of Medicaid and private coverage, which is again defined as total charges minus out-of-pocket costs. The independent variables in these equations are health insurance, health status and age of the child, and those characteristics of the mother available in both the SIPP and NMCUES data--region, age, health status, headship, marital status, education, income relative to the poverty line, utilization of medical care, and family size.[8] We use the results of this equation to assign expected values of coverage under Medicaid, private or no insurance to each child in our SIPP data on the basis of his or her characteristics.[9] We aggregate across children and the head to obtain a family-specific index of the value of medical care coverage for each of the three insurance categories.

Private Health Insurance. The major difficulty in the health care system for low-income families is the inadequate coverage of private health insurance. Almost three-quarters of the uninsured are workers and their dependents, for many employers do not sponsor insurance. Many characteristics affect a female head's probability of having private insurance available--her characteristics, especially health characteristics, her geographic location, industry of choice, degree of unionization, size of firm, and others. However, it should be noted that the presence of publicly-provided care also may be partially responsible for low private coverage, as a woman who is periodically on AFDC may choose Medicaid to be a substitute for private insurance, especially if her wage income is higher in a firm not offering insurance to its employees than in one that does offer coverage.

For our purposes, we require a good estimate of the exogenous probability that a woman can find a job with private coverage if she is off AFDC. When multiplied by the proxy for expected value of medical care if privately covered, an expected value of private insurance is obtained. We wish also to construct a probability of receiving insurance that is amenable to policy simulation.

To this end, we estimate a multinomial logit model for the probability of three events: no insurance at all, private health insurance coverage for the individual, and private health insurance coverage for the family. The independent variables that we use to explain the probability of falling into one of the three categories are a dummy for having only one job; a dummy for government employment; average health care costs per capita in the state; the characteristics

of the state Medicaid plan (presence of a medically needy program); personal characteristics such as education, age, race, health status, as well as variables for the presence of other adults in the family (who may have insurance), and for whether there is a disabled child in the family. The estimates are then used to predict the probabilities of having private insurance for family or individual and of being uninsured, and will be used as well to predict alternatives for policy simulation. State industry and occupation characteristics are used in the predictions to represent employment opportunities.

C. Results

The first step in creating the indexes or values of Medicaid and private insurance is to estimate equation (1), a multinomial logit equation on the type of insurance coverage among single women with children less than 18. The results are presented in Table 6. "No medical insurance coverage" is normalized to zero. The results suggest that younger women are more likely to be participating in Medicaid than to be uninsured or privately covered while older women are more likely to be covered by private insurance. Race only is significantly associated with private coverage, holding all other variables constant; white women appear less likely to have private coverage than to be uninsured or covered by Medicaid. Education is significantly associated with type of coverage; more years of education negatively with Medicaid participation and positively with private coverage. Having received job training programs, frequently associated with AFDC, is also associated positively with Medicaid participation. Being a head of household is

Table 6

Multinomial Logit Estimation of Insurance Coverage
(Mothers with No Insurance Normalized to Zero)

	Medicaid		Private Insurance	
INDEPENDENT VARIABLES				
Constant	-.09	(.1)	-1.56	(1.9)
Personal Characteristics				
Age	-.02	(1.9)*	.002	(2.0)**
White	.02	(.1)	-.56	(3.0)**
Education	-.09	(2.4)**	.07	(12.0)**
Training	.62	(2.5)**	.26	(1.3)
Head	-.31	(1.1)	.67	(2.7)**
Poor or fair health	-.15	(.8)	-.34	(2.0)**
Needs help	11.00	(.3)	10.5	(0.2)
Never married	.63	(2.5)**	.21	(0.8)
Divorced or widowed	-.28	(1.3)	-.31	(1.6)
Child Characteristics				
No. children < 18	.24	(2.6)**	-.25	(2.8)**
Disabled child	.64	(2.0)**	.33	(1.1)
Income				
Mean income	-.003	(8.9)**	.002	(10.3)**
Income ratio	1.81	(5.3)**	-.38	(1.2)
Coeff. of variation	-2.64	(3.2)**	1.37	(1.9)*
Child support	-1.92	(6.6)**	-.02	(.1)
Own home	.57	(1.1)	.64	(1.3)
Rents home	1.31	(2.7)**	.60	(1.3)
State Characteristics				
Has Medically Needy program	.77	(3.9)**	-.19	(1.1)
Health expenditures	.0003	(1.0)	-.0004	(1.2)
AFDC benefit	1.30	(2.9)**	-.08	(.2)

Notes: t-statistics in parentheses.
2x log likelihood = 2028.
No. of observations = 1598.
*Significant at 10% level.
**Significant at 5% level.

positively and significantly associated with having private insurance coverage; being never married is positively associated with participating in Medicaid. Perhaps surprisingly, own health status, as captured by two indicators (poor or fair health, and needs help doing household) has only limited significant association with type of coverage; women who report they are in fair or poor health are less likely to be covered by private insurance. In comparison, number of children and children's health are both significantly associated with mother's type of insurance coverage--having more children is positively associated with Medicaid participation and negatively with private coverage, while having a disabled child (physical or mental disability) is also positively associated with Medicaid participation; but not statistically associated with private coverage.

Turning to income and related measures, the pattern is as expected, given the income requirements for AFDC-Medicaid: greater personal income is negatively associated with Medicaid participation and positively associated with private coverage; the larger the share a woman's income is as a percentage of household income, the more likely she is to be a Medicaid participant; the more a woman's income varies over 4 interviewing months, the less likely she is to be a Medicaid participant and more likely to have private coverage; if the woman receives child support, she is less likely to be a Medicaid participant; and if the woman rents rather than owns a place to live, she is more likely to be a Medicaid participant.

Finally, the results for state characteristics suggest that women living in states which have a medically needy program are more likely to

be Medicaid participants as are women living in states with higher basic standards.[10] None of the included state characteristics are significantly associated with private insurance coverage. Health expenditures per capita are not significantly associated with type of coverage although the results suggest women in states with higher expenditures are somewhat more likely to be Medicaid participants than to have private coverage. These results then are generally consistent with expectations.

These results are used to create predicted values for Medicaid coverage, private coverage, and no coverage for each woman in the sample. For those women who are Medicaid participants, the mean predicted coverage of such participation is .74 (and .11 for private coverage). For those women with private insurance coverage, the predicted probability of such coverage is .69 (and .13 for Medicaid participation). For those with both types of coverage over the four waves, the predicted probabilities are .47 for Medicaid and .29 for private while the uninsured have .33 and .38 probabilities, respectively (see Table 9). These predicted values are used in the utilization equations discussed below. Their use avoids the potential endogeneity of type of coverage and utilization.

The equations to be estimated are (2) and (3) for inpatient and outpatient utilization respectively. The results are reported in Table 7.[11] The most significant determinant of both inpatient and outpatient utilization is health status. Health status is captured by two indicators: poor or fair health and needs help doing housework--both indicators work in the expected direction, increasing utilization of

Table 7

Mother's Utilization Equations

Outpatient Visits Per Year--Mother		
Independent Variables		
Constant	-4.81	(2.0)
Personal Characteristics		
Age	-.005	(.2)
White	-.10	(.2)
Education	.15	(1.6)*
Head	.68	(.9)
Poor or fair health	2.69	(5.8)**
Needs help	15.01	(9.3)**
Never married	-.34	(.5)
Divorced or widowed	.33	(.6)
Child Characteristics		
No. children < 18	-.21	(.9)
Disabled child	3.34	(4.6)**
Income		
Mean income	-.001	(2.1)**
Coeff. of variation	3.96	(1.8)*
Income ratio	-1.14	(1.3)
Insurance		
Medicaid[a]	3.67	(1.93)*
Private[a]	4.48	(1.94)**
State Characteristics		
Health expenditures	.003	(2.8)**
R squared	.12	
N	170	

Notes: t-statistics in parentheses.

[a]Probabilities or instrumental variables; see Table 5.

Table 7, Continued

Nights in Hospital Per Year--Mother		
Independent Variables		
Constant	-1.07	(.8)
Personal Characteristics		
Age	-.02	(1.1)
White	-.35	(1.3)
Education	.03	(.6)
Head	-.06	(.2)
Poor or fair health	1.68	(6.5)**
Needs help	3.74	(4.1)**
Never married	-.03	(.1)
Divorced or widowed	.38	(1.2)
Child Characteristics		
No. children < 18	-.002	(.0)
Disabled child	1.11	(2.7)**
Income		
Mean income	-.0003	(1.1)
Coeff. of variation	-.92	(.7)
Income ratio	-.20	(.4)
Insurance		
Medicaid[a]	.34	(.3)
Private[a]	.65	(.3)
State Characteristics		
Health expenditures	.002	(2.3)**
R squared	.6	
N	1701	

Notes: t-statistics in parentheses.

[a]Probabilities or instrumental variables; see Table 5.

medical care. The coefficient on "needs help doing housework" means those women on average have 15 more visits per year and nearly 4 more hospital nights per year than women who do not require such help. Women in fair or poor health have 2.7 more visits and 1.7 more hospital nights than women with good or excellent health, controlling for the many other factors in the equation. Having a disabled child (and the associated stress) is also significant and positively associated with both measures of medical care utilization. The only other variable that is significant in both equations is average health expenditures per capita in the state, which is positively associated with utilization.[12] The positive and significant coefficients on the instruments for insurance coverage in the outpatient equation suggest greatest use for those with private coverage and least use for those without coverage (the omitted category). The finding of no significance for type of coverage in the inpatient equation is of interest for it suggests no substitution of inpatient for outpatient care (except, possibly, indirectly through health status).[13] The small negative coefficient on mean income in the outpatient equation is consistent with expectations of low income elasticity (since insurance is controlled for) and suggests that this variable may partly proxy for work--and a higher value of time.

These equations are used to create six predicted utilization values for each woman in the sample; $\hat{I}_{2M}$, $\hat{I}_{2M}$, $\hat{I}_{1P}$, $\hat{I}_{2P}$, $\hat{I}_{1N}$, $\hat{I}_{2N}$ where the subscripts 1 and 2 refer to inpatient and outpatient care while M, P and N refer to Medicaid, private, and no coverage, respectively.

To obtain some idea of the variation in these predictions, the predicted values are presented by actual insurance coverage, by health

status and income relative to the poverty line in Table 9. The most striking patterns are the much lower predicted number of visits for these women if they were to have no insurance; the relatively high use of those with both types of coverage (see last column)--suggestive that many of these women receive Medicaid under the medically needy program--the much higher use of women in poor or fair health, and the inverse relationship between both measures of predicted utilization and income relative to the poverty line.

The next step in creating the indexes is to use the NMCUES data set to estimate a set of coefficients that will convert the expected utilization measures into dollar values. This is performed separately for outpatient visits and inpatient nights and also for other medical care (expenditures other than outpatient or inpatient stays such as pharmaceuticals, equipment, etc.). As discussed above, a sample from NMCUES that has the same characteristics as the SIPP data set are used (see Appendix Table A-1). The dollar value or dependent variable(s) is VALUE, which is defined as total charges minus out-of-pocket costs. This measure is designed to capture the <u>value</u> of the coverage as perceived by the consumer. This takes into account deductibles, copayments and coinsurance as well as a plan using a fixed fee schedule which requires the consumer to pay any difference between charges and fees. In other words, <u>value</u> captures the depth of insurance as well as extent of benefits or breadth. The results are presented in Table 8. Besides the utilization variables specified as linear-splines, region--to capture price differentials--and type of coverage are also included as independent variables.

Table 8

Mother's Value Equation
(NMCUES Data)
(Annual expenditures, 1980 dollars)

Value of Visits		
Constant	39.64	(1.6)
2 + visits	36.27	(1.4)
3 + visits	-23.81	(.5)
4 + visits	11.57	(.3)
7 + visits	7.56	(.5)
13 + visits	-15.13	(7.2)**
Northeast	-38.27	(1.6)*
Midwest	-62.09	(2.7)**
South	-83.73	(3.9)**
Medicaid	91.11	(4.3)**
Private	.801	(.0)
R^2	.57	
N	553	
Value of Hospital Care		
Constant	135.99	(1.5)
2 + nights hospital	326.52	(3.8)**
4 + nights hospital	-21.06	(.1)
7 + nights hospital	-178.32	(2.2)**
Northeast	-300.69	(3.2)**
Midwest	-150.07	(1.6)*
South	195.74	(2.2)**
Medicaid	-75.88	(.9)
Private	159.87	(2.0)**
R^2	.47	
N	553	
Value of Other Medical Care		
Constant	-1.87	(.2)
2 + visits	4.88	(.5)
3 + visits	-4.29	(.2)
4 + visits	1.19	(.1)
7 + visits	.63	(.1)
13 + visits	-1.71	(.7)
2 + nights	3.79	(.5)
4 + nights	-20.31	(1.5)
7 + nights	35.3	(4.8)**
Northeast	-3.74	(.4)
Midwest	-1.5	(.2)
South	4.58	(.6)
Medicaid	9.60	(1.3)
Private	-7.57	(1.1)
R^2	.33	
N	553	

Note: t-statistics in parentheses.

These resulting coefficients are then applied to the six expected utilization measures for each woman in the sample to create expected values of outpatient, inpatient, and other medical care. The expected values for ambulatory care range from 0 to 644; those for inpatient care from 0 to 2133 and for other medical care 0 to 69. The range for the total value (the sum of ambulatory, inpatient, and other) is 2.18 to 2740. The expected values by insurance coverage, poverty status, and health status are presented in Table 9. Looking at panel 1 by insurance coverage, the greatest expected total value is for private insurance for those who have both private and Medicaid types of insurance, 708.30 (in 1980 dollars), the smallest expected value is for Medicaid coverage among those with private coverage. For all groups, the expected total value is greater under private coverage than under Medicaid (even though the majority of private insurance requires coinsurance payments). Behind this pattern, is a more complex picture; expected utilization is greater under private coverage than under Medicaid or none for both ambulatory and inpatient care. Expected value of inpatient care is much higher under private coverage than under Medicaid coverage but the reverse holds for outpatient and other medical care. This may reflect differential (greater) private coverage for inpatient than outpatient care and differential reimbursement by private versus Medicaid payers to hospitals.

The total expected values for this population stratified by poverty (below the poverty line, one to two times the poverty line, and more than two times the poverty line) is greatest for those below the poverty line and much greater under private coverage than under Medicaid. Again

Table 9

Predicted Utilization, Health, and Predicted Value of Coverage
by Current Insurance Coverage

	1. Insurance Coverage			
	None	Medicaid	Private	Both
Health Status				
No. days ill in last 4 months	1.86	3.75	2.29	9.24
Fraction in poor or fair health	.54	.58	.38	.75
Predicted Variables				
Predicted insurance:				
Medicaid	.33	.74	.13	.47
Private	.38	.11	.69	.29
Predicted utilization:				
Private, visits	5.72	6.38	4.98	7.54
Medicaid, visits	4.9	5.57	4.16	6.73
None, visits	1.24	1.90	.5	3.06
Private, nights	1.67	2.08	1.30	2.28
Medicaid, nights	1.35	1.77	.99	1.97
None, nights	1.01	1.43	.65	1.63
Expected value of coverage:				
Private, total	458.05	602.21	379.86	708.30
Medicaid, total	303.53	433.57	263.09	546.11
Private, ambulatory	100.30	122.49	85.07	140.43
Medicaid, ambulatory	171.01	192.88	155.70	210.95
Private, nights	351.84	473.75	291.28	559.83
Medicaid, nights	112.86	221.40	90.96	313.97
Private, other	5.91	5.96	3.51	8.04
Medicaid, other	19.66	19.30	16.43	21.20
N	317	578	774	33

- Table, Continued -

Table 9, Continued

	2. Poverty Status		
	Below Poverty Line	Between One and Two Times Poverty Line	Greater than Twice the Poverty Line
Health Status			
No. days ill in last 4 months	3.05	3.86	2.33
Fraction in poor or fair health	.56	.49	.36
Predicted Variables			
Predicted insurance:			
Medicaid	.59	.33	.08
Private	.21	.45	.75
Predicted utilization:			
Private, visits	6.17	6.08	4.78
Medicaid, visits	5.36	5.26	3.97
None, visits	1.69	1.59	.30
Private, nights	1.96	1.73	1.18
Medicaid, nights	1.64	1.42	.87
None, nights	1.30	1.08	.53
Expected value of coverage:			
Private, total	547.83	498.68	366.25
Medicaid, total	388.68	354.57	249.25
Private, ambulatory	112.65	110.90	154.31
Medicaid, ambulatory	183.21	181.40	279.18
Private, nights	429.28	382.74	279.18
Medicaid, nights	186.07	154.48	78.87
Private, other	5.90	5.04	3.32
Medicaid, other	19.40	18.69	16.06
N	944	120	638

- Table, Continued -

Table 9, Continued

	3. Health Status	
	Excellent Health or Good	Poor or Fair Health
Health Status		
No. days ill in last 4 months	1.12	4.69
Predicted Variables		
Predicted insurance:		
Medicaid	.31	.46
Private	.51	.33
Actual insurance:		
Private	.56	.38
Predicted utilization:		
Private, visits	4.0	7.42
Medicaid, visits	3.18	6.61
None, visits	0	2.94
Private, nights	.73	2.64
Medicaid, nights	.42	2.33
None, nights	.08	1.99
Expected value of coverage:		
Private, total	203.91	770.67
Medicaid, total	165.21	516.43
Private, ambulatory	62.94	143.57
Medicaid, ambulatory	135.64	211.80
Private, nights	139.96	618.04
Medicaid, nights	15.35	282.32
Private, other	1.01	9.06
Medicaid, other	14.21	22.31
N	884	818

the underlying composition is not straightforward: the highest income group has a higher expected value of ambulatory care than the lower income groups but the reverse is true for inpatient care; the calculated values for ambulatory care are much greater if covered by Medicaid than private coverage (this is likely to reflect deductibles and coinsurance of private insurance, compared to the full coverage of Medicaid); inpatient care shows a very different pattern; the lowest income group has the highest expected value under each type of coverage but the expected value under private coverage is much greater than under Medicaid. (Recall that these values differ because both predicted utilization and value differ by insurance.) All of these factors combined result in the highest expected total value for the lowest income group under private coverage.

Finally, the last panel presents these expected values by health status. Expected value is much greater for women in poor or fair health than those in good or excellent health; and greater under private coverage ($771, $204) than under Medicaid ($516, $165). Again the value for ambulatory care is greater under Medicaid than under private coverage while the reverse is true for inpatient care.

For all of the subgroups the value of other medical care is quite small and consistently greater under Medicaid than private coverage. This is likely to reflect differential coverage of pharmaceuticals, eye glasses, and other benefits.

Next, we turn to children's value of Medicaid and private insurance coverage. This estimation is more straightforward for we directly estimate value rather than utilization and then value, and do so for all

medical care together rather than inpatient, outpatient and other medical care. We follow this procedure because SIPP has no utilization data for children. Instead we use NMCUES (see Appendix Table A-2 for a description of the data--essentially a sample with the same characteristics as SIPP children) and use independent variables available in both data sets. These are primarily data on mothers and/or the family.

The results are presented in Table 10. They suggest higher values for white children, for children whose mothers have more inpatient nights, for disabled children, and for children covered by Medicaid. There is also an indication that children whose mothers report fair or poor health have lower values of medical care and that children living in families whose incomes are below the poverty line have lower values of medical care; these are likely to reflect lower utilization, perhaps because of reduced access.

These coefficients are now used to create three estimated values for each child in the SIPP sample: one for private coverage, one for Medicaid coverage and one for no coverage. The range of values are from 0 to $191,396! The expected value under Medicaid is higher on average than for private coverage. Table 11 presents expected values by actual type of insurance coverage. Those actually having private coverage have a higher expected value under private coverage than under Medicaid ($738 vs. $442). The reverse is true for the expected values for those covered by Medicaid and those uninsured. Those who are Medicaid participants have the largest expected value, $2034, under Medicaid coverage compared to $1742 under private coverage.

Table 12

Family Index of Value of Medicaid and Private Insurance and Factors Influencing Values

	Medicaid Total (Annual)	Private Total (Annual)	No. Children < 18	% With Disabled Child	Fraction Report Poor or Fair Health	N
Current Insurance Coverage						
None	1,973	1,625	1.71	.066	.539	317
Medicaid	4,229	3,816	1.99	.188	.576	578
Private	1,508	1,144	1.62	.085	.379	774
By Current Health Status						
Good to excellent	1,365	895	1.71	.069	0	884
Fair to poor	4,113	3,832	1.84	.121	1.0	818
By Current Income Relative to Poverty Line						
Below poverty line	3,450	3,060	1.88	.095	.56	944
One to two times the poverty line	1,831	1,439	1.80	.125	.49	120
More than twice the poverty line	1,715	1,355	1.60	.086	.36	638

Under current poverty level, families living below the poverty line have higher expected values than those with higher levels of income. The ratios are in the .44 - .53 range.

These values then show substantial variation which reflects individual, family, and state characteristics.

Probability of Having Insurance Coverage. The next index we compute makes use of the probability of having insurance coverage if a woman works. We estimate this probability over women who work (963) using a multinomial logit equation of whether a woman has family coverage, individual coverage, or no insurance coverage via her employment. The estimates used to create the variable make use of only one employment characteristic--one employer (as opposed to two or more over a year interval). The alternative full equation, which is also presented in Table 13, includes industry variables; the results are consistent across the two equations.[14] The results reported in Table 13 suggest that age, race, education, headship, health status, marital status, number and health of children, receipt of child support, having one employer, and state health expenditures per capita are all significantly associated with type of insurance coverage; generally in anticipated ways. Having one employer increases the probability of coverage and especially of family coverage. Higher state expenditures seems to reduce the probability of having any coverage, probably because of higher insurance premiums in these states. Receiving child support is associated with higher probability of having coverage (which is in the woman's name), presumably because it is associated with higher socioeconomic status. One's own poor health is associated negatively

Table 13

Multinomial Logit Estimation of Type of Insurance Coverage
if Employed--No Insurance Normalized to 0
N=963

	Individual		Family		Individual		Family		$\bar{X}$
INDEPENDENT VARIABLES									
Constant	-5.51	(3.7)**	-4.46	(4.8)**	-5.38	(3.5)**	-4.46	(4.5)	
Personal Characteristics									
Age	.05	(3.0)**	.03	(2.9)**	.05	(3.1)**	.03	(2.9)**	33.96
White	-.26	(.9)	-.40	(2.1)**	-.27	(1.0)	-.37	(1.9)*	.68
Education	.13	(2.7)**	.18	(5.0)**	.12	(2.3)**	.18	(4.5)**	12.56
Training	.10	(.4)	-.11	(.6)	.07	(.3)	-.11	(.6)	.29
Head	.54	(1.8)*	.52	(2.5)**	.49	(1.6)	.45	(2.1)**	.80
Poor or fair health	-.32	(1.4)	-.30	(1.8)*	-.30	(1.3)	-.30	(1.7)*	.39
Never married	.75	(1.9)*	.14	(.5)	.75	(1.8)*	.08	(.3)	.18
Divorced or widowed	.72	(2.5)**	-.003	(.0)	.73	(2.4)*	-.002	(.0)	.59
Child Characteristics									
No. children < 18	-.35	(2.5)**	-.14	(1.6)	-.33	(2.4)*	-.12	(1.3)	1.64
Disabled child	.63	(.4)	.71	(2.1)**	.51	(1.2)	.58	(1.7)*	.08
Income									
Child support	1.10	(4.6)**	.38	(2.1)**	1.09	(4.5)*	.36	(1.9)*	.38
State Characteristics									
Health expenditures	-.0012	(2.7)*	-.001	(1.9)**	-.0012	(2.7)**	-.001	(2.0)**	400.4
Average cost/day--hospital	-.00	(.0)	.00	(1.1)	.00	(.1)	.00	(.9)	537.4
Has medical needy program	-.25	(.9)	-.04	(.2)	-.24	(.9)	-.09	(.4)	.67
AFDC benefits	-.43	(.8)	.29	(.7)	-.35	(.6)	.36	(.9)	.64
Employment Characteristics									
One employer	.62	(2.1)**	1.04	(4.5)**	.65	(2.1)**	1.00	(4.1)**	.87
Government employee					.28	(.7)	.80	(2.7)**	.14
Industry (dummy variables)									
Manufacturing					.23	(.7)	.95	(3.6)**	.20
Sales					-.37	(1.2)	-.41	(1.8)**	.23
Personal services					-1.75	(2.7)*	-1.03	(2.9)**	.06
Finance-business					.35	(1.1)	.21	(.8)	.16
-2x log likelihood						1659.98			

Note: t-statistics in parentheses.

with having insurance but having a disabled child (and hence greater expected value of insurance) is positively associated with having family coverage.

The second set of results in Table 13 suggests an important role for industry in determining probability of insurance coverage; government employees are more likely to have coverage, particularly family coverage, as are those in manufacturing. Persons in sales and personal service industry are less likely to have insurance coverage. Table 14 presents the predicted probabilities of insurance coverage, using the first set of results in Table 13, as .43 (family) and .09 (individual) for women with good or excellent health but .32 (family) and .07 (individual) for women with poor or fair health. Women who live in families with income below the poverty line have only a .29 predicted probability of family coverage (.05 individual) if they work, while those in families with income two or more times the poverty line have a .51 (.11) probability of such coverage if they work. Table 14 also provides an indication of the validity of the predictions; current insurance coverage is associated with the probability of coverage in expected ways. These probabilities are multiplied by the value of private coverage--the probability of family coverage times the total family value, the probability of individual coverage times the mother's total value--and summed to obtain the expected value of private coverage if employed.

Table 14

Predicted Probability of Family, Individual or No Private Insurance Coverage if Woman Works

	Family Coverage	Individual Coverage	No Coverage
By Current Family Income			
Below poverty now	.29	.05	.76
One to two times poverty line	.43	.09	.48
Greater than twice the poverty line	.51	.11	.38
By Current Health Status			
Good or excellent	.43	.09	.48
Fair or poor	.32	.07	.61
By Current Insurance Status			
None	.36	.08	.56
Medicaid	.24	.04	.72
Private	.50	.11	.39
Both	.35	.06	.59

VI. STATIC ANALYSIS OF THE NINTH SIPP WAVE

A. Characteristics of the Sample

The analysis of AFDC participation and work effort is based primarily on the use of data from the ninth SIPP wave, conducted in the period April to July 1986. Using the families interviewed in that wave, a sample was drawn of all female heads of family under 65 with at least one child under the age of 18 in the family. Women included in the sample were required to be present in Wave 3 of the SIPP, in order to match the heterogeneity indexes. A few women were also excluded because of missing data or outliers for the variables used in the analysis. There are 545 such women in the sample.

The main demographic variables used in the analysis are shown in Table 15. As the table shows, about 56 percent of all female heads in the sample work. About one-third are on AFDC, and there is very little overlap between the working female heads and those on the AFDC rolls--only 6 percent of workers receive AFDC and only 10 percent of AFDC recipients work. About 42 percent of the sample is covered by Medicaid. As noted previously, all of those on AFDC are so covered but only 14 percent of nonrecipients have such coverage. Medicaid coverage is consequently also highly negatively related to employment status--82 percent of nonworkers are so covered but only 11 percent of workers are. As for private health insurance, 47 percent of the sample is so covered but this is heavily weighted toward the working subsample not on AFDC.

The table also shows the means of other characteristics and how they differ between AFDC recipient and nonrecipients, and workers and

Table 15

Characteristics of the Wave 9 Sample

	All	AFDC Status[a]		Employment Status[a]	
		On	Off	Working	Not Working
Fraction with working head	0.56	0.10	0.80	1.00	0.0
Fraction on AFDC	0.34	1.00	0.0	0.06	0.69
Fraction covered by Medicaid	0.42	1.00	0.14	0.11	0.82
Fraction covered by private health insurance	0.47	0.10	0.66	0.73	0.15
Age of head (years)	33.67	30.98	35.04	34.88	32.11
Education of head (years)	11.74	11.10	12.07	12.21	11.14
Race (1 = nonwhite)	0.42	0.53	0.37	0.37	0.49
Health of head (1 = poor or fair)	0.50	0.57	0.47	0.45	0.57
Fraction with children 0-5	0.50	0.86	0.32	0.29	0.78
Fraction with children 6-12	0.79	0.89	0.74	0.77	0.82
Family size (persons)	3.27	3.59	3.10	3.10	3.48
Regional location (fraction):					
South	0.37	0.27	0.41	0.40	0.33
Midwest	0.26	0.35	0.21	0.22	0.31
West	0.17	0.17	0.17	0.17	0.16

Notes: Sample size = 545.

[a]As of month prior to interview.

Table 16

Mean Weekly Benefits of the Wave 9 Sample
(1984 dollars)

	All	AFDC Status[a] On	AFDC Status[a] Off	Employment Status[a] Working	Employment Status[a] Not Working
Medicaid heterogeneity index	$33.5	$38.1	$31.0	$30.0	$37.9
State Medicaid insurance value	37.8	43.3	35.0	35.3	41.0
Private insurance heterogeneity index	9.6	4.2	12.3	12.4	5.9
AFDC benefit	79.2	91.1	73.1	74.4	85.4
Food Stamp benefit	34.5	45.9	28.7	31.2	38.8

[a]As of month prior to interview.

nonworkers. All the patterns in the table are as expected. Relative to nonrecipients, AFDC recipients are younger, have fewer years of education, are poorer in health, and have more children and larger families. Relative to nonworkers, working families have older heads with more education and better health, and have fewer children and smaller families.

There are several major benefit-related variables that are used in the analysis. First and foremost is the family Medicaid heterogeneity index whose construction was described in the last section. This variable, equal to the sum over the mother and all children of expected medical expenditures if on Medicaid (net of any out-of-pocket costs), is our proxy for the family-specific valuation of the Medicaid program. A similar variable is constructed for expected medical expenditures if covered by private health insurance, as described in the previous section. Since coverage by private health insurance is not automatic in the same way that Medicaid is for AFDC recipients, the private health variable is multiplied by the probability of receiving such coverage. Therefore our private insurance variable is the "expected" value, taking into account not only expected expenditures if covered but also the probability of being covered.

In addition to these variables, we construct a standard "state" Medicaid benefit variable similar to that used in prior research. The crudest such variable is simply average Medicaid expenditures in a state, but we construct a slightly more realistic variant of such a variable by taking the average over all AFDC families--i.e., all Medicaid eligibles--instead of only over those actually receiving

Medicaid expenditures during a year. We also allow the estimated value to depend upon family size by estimating, for each state, average Medicaid expenditures for female heads and for dependent children separately and by then calculating a sum according to the number of children present. This value is then deflated by the ratio of Medicaid recipients to eligibles (i.e., AFDC female heads) in the state to proxy an insurance value. We shall compare the performance of this variable to the Medicaid heterogeneity index we have previously described.

A variable that we would prefer to include but cannot for data reasons is an indicator for the availability of free or charity care at local hospitals if off AFDC. The availability of such care should provide an alternative to Medicaid and should therefore reduce, to some extent, the necessity to joint AFDC in order to receive medical care. Since this variable will be omitted from our equations for AFDC participation by necessity, we can only speculate on the possible biases the omission may induce in our estimated effects of Medicaid. The direction of the bias depends primarily upon whether charity care is more or less available in those states and for those individuals with higher Medicaid benefits. Unfortunately, we have no evidence on this correlation, but it would not be surprising if states with generous Medicaid benefits were also those supplying the most charity care. If so, the coefficient on the Medicaid benefit in our AFDC participation regressions should be considered to be biased downward, for higher Medicaid benefits are present at the same time as more available charity care and the latter should reduce AFDC participation. Thus the true effects of Medicaid may be higher than those we estimate below.

We also construct family-specific measures of AFDC benefits and Food Stamp benefits. Both are constructed as the maximum payment for a family with no other income and hence are conceptually similar to the "guarantee" level of economic analysis. For AFDC benefits we use unpublished data provided by the Office of Family Assistance and for Food Stamps we use data from the U.S. Department of Agriculture. Both data sources allow us to estimate the maximum payment level for the exact family size of each female-headed family in our sample.[15]

Table 16 shows the mean values of these benefit variables in our sample. The mean Medicaid heterogeneity index is $33.50 per week (1984 dollars) and is higher for AFDC recipients than for nonrecipients, and higher for nonworkers than for workers. These correlations are not themselves of great importance because they may only reflect family size variations, as shown in Table 15, as well as other variations in demographic characteristics between AFDC recipients and nonrecipients and between workers and nonworkers. It will be necessary to econometrically control for these other characteristics before drawing conclusions about the correlations between our index and AFDC and labor force participation.

The state Medicaid index follows the same patterns, as should be expected. The values of the two indexes are not identical, for they are constructed in quite different ways and measure very different quantities in concept. In any case, the differences in their means are less important than the differences in the two that arise in the way they vary across different families in the sample. The state Medicaid index varies only across family sizes and across states, whereas our

Medicaid index varies across families according to a large number of characteristics related to health and other demographics as well.

The private health insurance heterogeneity index is considerably smaller than that for Medicaid, but follows the expected patterns--the index is higher for non-AFDC recipients than for recipients and higher for workers than nonworkers. Once again, it is necessary to control for other demographic characteristics econometrically before drawing conclusions about behavior from these correlations. AFDC benefits and Food Stamps are also higher for AFDC recipients and nonworkers than nonrecipients and workers, respectively, as shown in Table 16.

B. Econometric Model

There are two outcome variables of interest in our analysis: AFDC participation and employment status. We choose the latter as our measure of work effort instead of hours of work because, for the female-head population in the United States, the decision of whether to work at all is considerably more important in explaining variations in labor supply than is the choice of hours of work once working (only 50 percent of female heads work). Both outcome measures pertain to the month prior to the ninth wave SIPP interview and thus represent point-in-time measures.

Given these two outcome variables, there are three alternatives from which the female head must choose: (1) to not work or to have low enough earnings to gain eligibility for AFDC and to then choose to apply for and receive AFDC benefits; (2) to not work or to have low enough earnings to gain eligibility for AFDC and to then not apply for AFDC

benefits; or (3) to work sufficiently long hours to obtain earnings in excess of the AFDC eligibility point and therefore to be ineligible for AFDC. It is important to note that a significant fraction of women choose category (2). Some fraction of female-headed families who are eligible for AFDC do not apply for benefits--that is, they locate on the segment AB in Figure 1(a). They do so either for reasons of stigma (Moffitt, 1983), because the potential benefit is too low relative to the psychic and real costs of applying and receiving benefits, or for other reasons. For example, in Table 15 above, 31 percent of nonworkers--most of whom are eligible for benefits--do not receive them.[16] It is the existence of this category that makes the work-effort decision not identical to the AFDC participation decision, for if all female heads who were eligible for AFDC applied for benefits, the choice of hours of work would be equivalent to the choice of AFDC participation. As it is, while our two outcome variables will be highly negatively correlated, they will not be equivalent and there is therefore no mathematical necessity for a variable that significantly affects one to significantly affect the other.

The conceptual framework we use to analyze the determinants of the choice of AFDC participation and employment status is based upon the economic theory of choice. According to that theory, the choice of AFDC participation is determined primarily by the level of the benefit, and the choice of employment status is based upon the relative levels of income to be had from working versus not working. The effects of these variables will, of course, be mediated and affected by other characteristics of the woman and her family, characteristics which will

also be included in the equations for AFDC participation and employment status.

In the choice of employment status, we will assume that the female head considers the option of working part-time vs. the option of working full-time vs. the option of not working at all. This procedure is based upon the model of Fraker and Moffitt (1988), and is designed to simplify away from the more difficult estimation task that would arise if the female head's choice of every possible hours of work were examined.

We disaggregate income into four components: (1) net after-tax income from private sources and the labor market, (2) income from cash AFDC benefits and from Food Stamp coupons, (3) expected value of the Medicaid program, and (4) expected value of private health insurance. We calculate values of the first three of these income variables at three hours-of-work points: zero (i.e., nonwork), 20 per week (part-time), and 40 per week (full-time). Using these variables we specify AFDC participation and employment status equations of the following form:

$$P^* = \beta_o + \beta_1 Y_{P0} + \beta_2 B_{A0} + \beta_3 B_{F0} + \beta_4 M_0 + \beta_5 H$$
$$+ \beta_6 Y_{P1} + \beta_7 B_{A1} + \beta_8 B_{F1} + \beta_9 M_1$$
$$+ \beta_{10} Y_{P2} + \beta_{11} B_{A2} + \beta_{12} B_{F2} + \beta_{13} M_2 + X\delta$$

$$P = 1 \text{ if } P^* \geq 0$$
$$= 0 \text{ if } P^* < 0$$

$$E^* = \delta_o + \delta_1 Y_{P0} + \delta_2 B_{A0} + \delta_3 B_{F0} + \delta_4 M_0 + \delta_5 H$$
$$+ \delta_6 Y_{P1} + \delta_7 B_{A1} + \delta_8 B_{F1} + \delta_9 M_1$$
$$+ \delta_{10} Y_{P2} + \delta_{11} B_{A2} + \delta_{12} B_{F2} + \delta_{13} M_2 + X\alpha$$

$E = 1$ if $E^* \geq 0$

$= 0$ if $E^* < 0$

where

P = Dummy variable equal to 1 if on AFDC, 0 if not

P^* = Latent index for P

E = Dummy variable equal to 1 if working, 0 if not

E^* = Latent index for E

Y_{Pi} = income from private sources (earnings plus nontransfer nonwage income) net of income and payroll taxes at hours point i

B_{Ai} = potential AFDC benefit at hours point i

B_{Fi} = potential Food Stamp benefit at hours point 1

M_i = Medicaid heterogeneity index at hours point i

H = Private-health-insurance heterogeneity index

X = Vector of other socioeconomic characteristics

$i = 0,1,2$ for nonwork, part-time, and full-time work

The calculation of the independent variables is of considerable importance. Private income equals the (after-tax) sum of nonwage income and earnings at each point. The former is constructed as the sum of all types of nontransfer nonwage income in the family. Pretax earnings at the full-time and part-time points are obtained for nonworkers by estimating a selectivity-bias-adjusted equation for the hourly wage rate and by multiplying the predicted values from this equation by 20 or 40.[17] Before-tax-income at each hours point is then reduced by federal income and payroll taxes, the former incorporating the earned income tax credit.

AFDC benefits and Food Stamp benefits are calculated from benefit formulas that capture their major determining variables. In the AFDC benefit formula, net income is calculated as the sum of earnings and nontransfer nonwage income minus work-related expenses and child care expenses. Of the two deductions, only child care expenses are allowed to vary with earnings, for data reasons. The benefit is set equal to zero if it is calculated to be less than or equal to zero. The $30-and-one-third deductions are ignored, as they are not permanently available to recipients. Food Stamp benefits are calculated by applying the Food Stamp benefit formula, which involves applying a 30 percent benefit-reduction rate against net income after the earned income deduction of 18 percent (see Fraker and Moffitt, 1988). AFDC benefits are set equal to zero in this calculation.

The Medicaid heterogeneity index is assumed to proxy the potential value of Medicaid benefits should the family participate in AFDC, as noted earlier. Therefore the index is set equal to zero if the potential AFDC benefit is zero. Since the potential AFDC benefit is rarely zero at the nonwork point (unless nonwage income is very high) but is often zero at the part-time or full-time work points, an implicit benefit-reduction rate applies for Medicaid as well, since it is set to zero at the same points. To capture the possible receipt of Medicaid from the medically needy program, we shall also estimate specifications in which an extra variable is added which equals the product of the Medicaid heterogeneity index and a dummy variable for medically needy states. Finally, we shall test the state Medicaid insurance variable as well, constructing it at the various hours points in the same manner.

The private health insurance variable is designed to capture the potential value of such insurance. In our basic specification, we apply a single probability-of-receiving private insurance to the expected value of that insurance if covered, as discussed earlier. In a separate test, we also estimate a version in which two separate probabilities of coverage are applied to the expected value amount, one that proxies the coverage probability should the woman work and the other proxying the coverage probability should she not work. The two probabilities are quite different, as the means in Table 15 suggested.

Our theoretical expectations for the signs of the variables in the equations are very intuitive in most respects. Higher private income at part-time or full-time work should increase employment status and higher private income at the zero-work point should decrease employment status. However, higher private income at any point should reduce AFDC participation probabilities as well. Higher AFDC benefits at part-time or full-time work should increase the probability of being employed--this effect measures, for example, the effect of lowering the AFDC benefit reduction rate--but higher AFDC benefits at the zero-work point should reduce employment probabilities. Higher AFDC benefits at any point should increase AFDC participation rates.

The effects of Food Stamps on AFDC participation are ambiguous a priori. However, although the Food Stamp program taxes AFDC benefits, most AFDC families still receive them. Moreover, it is administratively easier to obtain Food Stamps if on AFDC than if not. Consequently, we expect the signs to be the same as those on the AFDC benefit variables.

We also expect the Food Stamp coefficients to be of the same sign as the AFDC benefit coefficients in the employment status equation.

The Medicaid and private health insurance variables measure similar effects. An increase in the Medicaid heterogeneity index at any point should increase AFDC participation probabilities, since Medicaid eligibility is tied to AFDC eligibility. This hypothesis is the major question of our study. However, the magnitude of the increase in AFDC participation probabilities that arises from increases in the Medicaid heterogeneity index at part-time or full-time work is of particular interest because such increases will partly determine the effect of eliminating the Medicaid notch. For example, eliminating the notch by allowing Medicaid benefits to be received by workers above the AFDC eligibility point, at part-time or full-time work, would represent an increase in Medicaid benefits at those points from a value to zero to some positive value. Our coefficients will therefore measure the effect of such a change. However, our variables for potential Medicaid benefits at part-time and full-time work will differ from benefits at the zero-hours point only because the AFDC eligibility point varies across families.

For the employment status equation, an increase in the index at the zero-hours point should decrease employment probabilities but an increase at the part-time or full-time points should increase those probabilities. The latter should represent our estimates of the beneficial effects of eliminating the Medicaid notch--the positive effects on employment. For private health insurance, we expect that

increases in such insurance will increase employment status and decrease AFDC participation.

Values of the main income variables at the different hours points are shown in Table 17. As expected, private income is higher at the working points and the benefit variables are lower. It is worth noting, however, that benefits are positive for some of the sample even at full-time work, a sign of low hourly wage rates. It may also be noted that private income at part-time work is approximately equal to the sum of AFDC and Food Stamp benefits at the zero-work point, a rough indication of the work disincentives of the programs. When Medicaid is added in--though the dollar amounts in Table 17 cannot be compared to the income and benefit variables--the part-time-work point would be dominated by the zero-work point. In principle, private health insurance could offset the Medicaid disincentive but, as Table 16 indicated, the expected value of private health insurance is below that of Medicaid. This could be changed, of course, if the probability of private insurance coverage for workers were increased. In any case, note that the full-time-work point generally dominates the no-work point.

C. Results

Preliminary attempts at estimation of the two equations by probit analysis encountered difficulties because of high degrees of multicollinearity between the part-time and full-time variables. As shown in the first column of Table 18, the correlation coefficients between the part-time and full-time variables for each of the four income types are never less than 0.84 and reach as high as 0.96. This

Table 17

Mean Weekly Income Variables

	No Work	Part-Time Work	Full-Time Work
Private income	$37.2	$132.9	$216.8
AFDC benefit	79.2	35.8	13.7
Food Stamp benefits	34.5	19.5	10.1
Medicaid heterogeneity index	33.5	20.2	10.6
State Medicaid insurance value	37.8	23.6	11.4

Table 18

Correlation Coefficients between the Income Variables

	Part-Time Work and Full-Time Work	No Work and Part-Time Work	No Work and Full-Time Work
Private income	0.96	0.84	0.67
AFDC	0.85	0.67	0.56
Food Stamps	0.92	0.87	0.73
Medicaid heterogeneity	0.84	0.73	0.64

high degree of correlation is an indication that the implicit slopes of the income functions over the range between 20 hours of work per week and 40 hours of work per week are approximately the same for all female heads in the sample. Effectively, this implies that there is very little variation in the implicit tax rates and benefit-reduction rates in the income formulas. For example, for private income, the income tax and payroll tax rates do not vary sufficiently across female heads to permit after-tax full-time income to differ from part-time private income by a different amount for different female heads. Likewise, the AFDC benefit-reduction rates--which, as noted previously, vary across female heads only by family size and child care expenses--are insufficiently different across the observations. The implicit benefit reduction rate for the Medicaid heterogeneity index is based upon that for the AFDC benefit as well.[18]

As a result of this problem, the estimates that will be presented include only the part-time or full-time income variables, and not both. Tables 19 and 20 show the results of probit estimation of the AFDC participation and employment-status equations, respectively, of this type.[19] Column (1) of Table 19 shows the results of an equation containing only the income values at zero hours of work. As the table indicates, private nonwage income has no significant effect on AFDC participation probabilities, contrary to our expectation of a negative effect. It is probable that the small amounts of such income present in the sample are not measured sufficiently accurately to capture the effects we desire. The results also show that both the AFDC and the Food Stamp benefit have significantly positive effects on participation,

Table 19

AFDC Participation Probit Estimates: Basic[a]

	(1)	(2)	(3)	(4)	(5)
Private Income:					
Zero hours	0.001	0.028*	0.016*	0.020*	0.015*
	(0.001)	(0.004)	(0.003)	(0.006)	(0.003)
Part-time	--	-0.026*	--	-0.019*	--
		(0.004)		(0.006)	
Full-time	--	--	-0.014*	--	-0.013*
			(0.002)		(0.003)
AFDC Benefit:					
Zero hours	0.007*	0.008*	0.008*	-0.002	0.005
	(0.003)	(0.004)	(0.004)	(0.006)	(0.004)
Part-time	--	--	--	0.013*	--
				(0.005)	
Full-time	--	--	--	--	0.011*
					(0.006)
Food Stamp Benefit:					
Zero hours	0.017*	0.025*	0.024*	0.019	0.024*
	(0.004)	(0.005)	(0.005)	(0.017)	(0.008)
Part-time	--	--	--	-0.002	--
				(0.018)	
Full-time	--	--	--	--	-0.003
					(0.011)
Medicaid Index:					
Zero hours	0.010*	0.007*	0.007*	0.009*	0.008*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Part-time	--	--	--	-0.005*	--
				(0.003)	
Full-time	--	--	--	--	-0.007*
					(0.004)
Private insurance index	-0.026*	-0.016*	-0.017*	-0.014*	-0.014*
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
Log likelihood value	-253.6	-205.1	-203.8	-198.6	-200.8

Notes: Standard errors in parentheses.
[a]Other variables shown in Appendix Table A-4.
*Significant at 10% level.

Table 20

Employment-Status Probit Estimates: Basic[a]

	(1)	(2)	(3)	(4)	(5)
Private Income:					
Zero hours	-0.006*	-0.034*	-0.022*	-0.028*	-0.022*
	(0.001)	(0.003)	(0.002)	(0.004)	(0.003)
Part-time	--	0.026*	--	-0.016*	--
		(0.003)		(0.004)	
Full-time	--	--	0.015*	--	0.015*
			(0.001)		(0.002)
AFDC Benefit:					
Zero hours	-0.004	-0.005	-0.005	0.006	-0.004
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Part-time	--	--	--	-0.016*	--
				(0.004)	
Full-time	--	--	--	--	-0.002*
					(0.004)
Food Stamp Benefit:					
Zero hours	-0.009*	-0.014*	-0.013*	-0.019*	-0.017*
	(0.004)	(0.005)	(0.005)	(0.011)	(0.006)
Part-time	--	--	--	0.017	--
				(0.013)	
Full-time	--	--	--	--	0.010
					(0.009)
Medicaid Index:					
Zero hours	-0.012*	-0.006*	-0.006*	-0.007*	-0.006*
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Part-time	--	--	--	0.001	--
				(0.003)	
Full-time	--	--	--	--	-0.000[b]
					(0.003)
Private insurance index	0.027*	0.015*	0.016*	0.017*	0.017*
	(0.004)	(0.005)	(0.005)	(0.006)	(0.005)
Log likelihood value	-286.5	-220.5	-218.5	-211.8	-217.8

Notes: Standard errors in parentheses.
[a]Other variables shown in Appendix Table A-4.
[b]Less than 0.0005 in absolute value.
*Significant at 10% level.

as expected and as past studies have also found. The final two coefficients shown are those on the Medicaid heterogeneity index and the private health insurance index. The Medicaid coefficient is positive and the private insurance index is negative, and both are highly significant. Both signs are as hypothesized. It is interesting to note that the private health insurance coefficient is larger in magnitude than that on the Medicaid index, indicating that a dollar of the former has a bigger effect than a dollar of the latter.

Columns (2) and (3) of the table show the effects of adding private income variables at part-time and full-time work. These new variables implicitly pick up the effects of the net hourly wage rate and, other things being equal, should have negative coefficients. As the table indicates, they do indeed have coefficients of such sign and both are significant at conventional levels. This result is consistent with past work on AFDC participation, which generally shows negative effects of hourly wage rates. The coefficients on the rest of the variables in the equation show little change save that on nonwage income (private income at zero hours), which is now unexpectedly positive.

Columns (4) and (5) show the effects of adding the part-time and full-time variables, respectively, for the program benefits. The results are extremely mixed and not consistently of the expected signs. While the AFDC benefits at part-time and full-time do have significant and positive coefficients, they are clearly picking up the effects of the AFDC guarantee, which is now insignificant. The part-time and full-time Food Stamp benefit coefficients are insignificant and negative. In addition, the part-time and full-time variables for the Medicaid index

are negative and are significant in both specifications. (Note that the zero-hours Medicaid coefficient remains positive and the private insurance coefficient remains negative.) Thus there are no indications of any positive Medicaid notch effects on AFDC participation in these results.

The probable explanation for the mixed and inconsistent signs on the part-time and full-time variables for the three transfer benefits is once again the problem of multicollinearity. As the second and third columns of Table 18 indicate, the correlations are high between the zero-hours benefit variables and their counterparts at the two working hours points. The reason for these strong correlations is identical to that discussed earlier, which is the lack of sample variation in implicit benefit-reduction rates. Those in the three benefit formulas are virtually identical across families and hence there is insufficient sample variation to identify the effects of the benefit-reduction rate--which is what the part-time and full-time variables are intended to do. Consequently, our conclusion from this exercise is that robust estimates of the effects of the Medicaid notch will not be obtainable unless data with some exogenous variation in the availability of Medicaid for working AFDC recipients or ex-recipients can be constructed and utilized for analysis.

Table 20 shows the results of the same five specifications for the employment-status equation. Column (1) shows significant negative effects of private nonwage income and the Food Stamp benefit, and negative but insignificant effects of the AFDC benefit. The Medicaid heterogeneity index has a negative and strongly significant coefficient,

and the private insurance index has a positive and strongly significant coefficient. Consequently these results confirm and strengthen those found for the AFDC participation equation. Once again the magnitude of the private insurance coefficient is considerably larger than that on the Medicaid index.

The other results in the table are similar to those obtained for the AFDC participation equation. While the part-time and full-time variables for private income are strongly positive and significant, indicating indirectly that there are strong wage effects on labor supply in the data, the corresponding variables for the three benefit types in the last two columns are once again of varying sign and generally quite insignificant. Indeed, the part-time and full-time Medicaid variables are completely insignificant, implying no effects of eliminating the Medicaid notch on work incentives. Again the private insurance coefficients remain negative and significant throughout. The high degree of multicollinearity noted in the prior equation is also present here, which is the best explanation for the mixed results.

Tables 21 and 22 show further results and tests for the AFDC participation and employment-status equations, respectively. Columns (1) in the two tables show the effect of using the state Medicaid insurance value, as discussed above, instead of our Medicaid heterogeneity index. As the tables indicate, the state insurance value coefficients are insignificant. Thus our data are confirming the results of Blank (1989) on the apparent insignificance of Medicaid effects, especially on AFDC participation, when the crude state-specific average Medicaid value is used. Apparently it is necessary, as our

Table 21

AFDC Participation Probit Estimates: Further Results

	(1)	(2)	(3)	(4)
Private income	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
AFDC benefit	0.008* (0.003)	0.005* (0.003)	0.008* (0.003)	0.008* (0.003)
Food Stamps	0.017* (0.004)	0.017* (0.004)	0.018* (0.004)	0.017* (0.004)
Medicaid index	--	--	0.007* (0.002)	-0.012 (0.011)
Mothers	--	0.032* (0.015)	--	--
Children	--	0.009* (0.002)	--	--
Medicaid index Spline[a]	--	--	--	0.025* (0.012)
State Medicaid insurance value	0.005 (0.006)	--	--	--
Private insurance index	-0.010* (0.003)	-0.024* (0.005)	--	-0.027* (0.005)
Working	--	--	-0.036* (0.008)	--
Not working	--	--	0.006 (0.007)	--

Notes: Standard errors in parentheses.

*Significant at 10% level.

All income variables measured at zero hours.

[a]Defined as Max (0, M-C), where M is the value of the Medicaid index and C is the value of M at the 75th percentile of its distribution.

Table 22

Employment Status Probit Estimates: Further Results

	(1)	(2)	(3)	(4)
Private income	-0.005*	-0.006*	-0.005*	-0.005*
	(0.001)	(0.001)	(0.001)	(0.001)
AFDC benefit	-0.005*	-0.002	-0.005*	-0.005
	(0.003)	(0.003)	(0.003)	(0.003)
Food Stamps	-0.009*	-0.009*	-0.010*	-0.009*
	(0.004)	(0.004)	(0.004)	(0.004)
Medicaid index	--	--	-0.012*	0.003
			(0.003)	(0.009)
Mothers	--	-0.041*	--	--
		(0.017)		
Children	--	-0.011*	--	--
		(0.002)		
Medicaid index Spline[a]	--	--	--	-0.017*
				(0.010)
State Medicaid insurance value	-0.007	--	--	--
	(0.006)			
Private insurance index	0.007*	0.025*	--	0.029*
	(0.002)	(0.004)		(0.004)
Working	--	--	0.035*	--
			(0.007)	
Not working	--	--	-0.002	--
			(0.006)	

Notes: Standard errors in parentheses.

*Significant at 10% level.

All income variables measured at zero hours.

[a]Defined as Max (0, M-C), where M is the value of the Medicaid index and C is the value of M at the 75th percentile of its distribution.

prior tables indicate, to allow individual heterogeneity in the Medicaid variable.

Columns (2) and (3) in the tables show the effects of splitting up the Medicaid heterogeneity index into its components for mothers and children and of splitting up the private insurance index into working and nonworking components, respectively. The first pair of results shows that the Medicaid indexes for both mothers and children have significant positive and negative effects on AFDC participation and labor supply, respectively, but that the effects in both cases are stronger for the mother than for the children. Whether there are alternative sources of health care for the children or whether the mother is more likely to respond to her own health needs than to those of the children cannot be determined from these overall results. The third columns show that the influence of private health insurance when working has a much more powerful effect than its availability if not working. This should accord with intuition, for the Medicaid program is available to these women (through AFDC) should they have low income and not work. Medicaid is less likely to be available for workers, and hence the attraction of private health insurance there should be strong.

The final columns in Tables 21 and 22 show the effects of allowing a "spline" in the Medicaid index variable. The variable entered tests whether the coefficient on the index is different for the one-quarter of the sample with the highest values of the index (see footnote to Table 21 for exact definition). Table 21 shows, interestingly, that the effect of the index for the three-quarters of the sample with the lower values of the index is insignificantly different from zero (-0.012, t-

statistic = 1.11) but that the effect of the index for the highest quarter of the sample is significantly greater. The net effect for the high-index sample is hence 0.013 (=.025-.012) and is highly significant (t=4.8). The implication of this result is that variations in the value of the Medicaid subsidy have no effect on AFDC participation except for the minority of families with very high expected medical expenditures; for the majority of families there is little effect.

Table 22 shows that a similar result holds for the labor supply effects of Medicaid. The effect for three-quarters of families is insignificant, but the effect for the top one-quarter with the highest expected medical expenditures is -0.014 (= -0.017 + 0.003) and strongly significant (t=5.9). Thus the work disincentives of the Medicaid program again only appear amongst those with the heaviest expected medical expenditures.

Finally, Tables 23 and 24 show estimates of the effect of the medically needy program on AFDC participation and employment status, respectively. The first columns of the two tables show the effects of adding a variable equal to the Medicaid index in medically needy states but zero in other states. The results show that, in states with a medically needy program, the positive effect of Medicaid on AFDC participation and the negative effect of Medicaid on employment status are much smaller than in nonmedically needy states. This implies that the availability of Medicaid benefits when off the rolls, even if only for catastrophic coverage as the medically needy program provides, may create incentives for staying off the AFDC rolls and staying in the work force. Nevertheless, the other two columns in the table, which show

Table 23

AFDC Participation Probit Estimates: Medically Needy

	Full Sample	States with Medically Needy Program	States without Medically Needy Program
Private income	0.001	0.001	-0.000[a]
	(0.001)	(0.004)	(0.002)
AFDC benefit	0.008*	0.004	0.006*
	(0.003)	(0.011)	(0.004)
Food Stamps	0.017*	0.032*	0.006
	(0.004)	(0.010)	(0.005)
Medicaid index	0.012*	0.011*	0.011*
	(0.002)	(0.004)	(0.002)
Medicaid index* Medically needy dummy	-0.006*	--	--
	(0.003)		
Private insurance index	-0.028*	-0.144*	-0.025*
	(0.005)	(0.037)	(0.006)
Sample size	545	192	353

Notes: Standard errors in parentheses.

*Significant at 10% level.

[a]Less than 0.0005 in absolute value.

Table 24

Employment Status Probit Estimates: Medically Needy

	Full Sample	States with Medically Needy Program	States without Medically Needy Program
Private income	-0.006*	-0.006*	-0.007*
	(0.001)	(0.002)	(0.002)
AFDC benefit	-0.004	0.008	-0.005*
	(0.003)	(0.007)	(0.003)
Food stamps	-0.008*	0.007	-0.010*
	(0.004)	(0.008)	(0.006)
Medicaid index	-0.014*	-0.014*	0.014*
	(0.002)	(0.005)	(0.002)
Medicaid index* Medically needy dummy	0.007*	--	--
	(0.003)		
Private insurance index	0.029*	0.225*	0.026*
	(0.004)	(0.045)	(0.005)
Sample size	545	192	353

Notes: Standard errors in parentheses.

*Significant at 10% level.

separate equation estimates for those female heads in states with medically needy programs and those without such programs, cast doubt on these results. The estimates show that, when all coefficients are allowed to differ between medically-needy and non-medically-needy states, the effect of the Medicaid index is the same in both. The statistical interpretation is that the effects found in the first columns were spurious and the result of differences across the two state groupings in coefficients other than Medicaid. Thus the evidence in favor of any effects of the medically needy program is tentative at best.

To briefly summarize the results of this chapter on the analysis of the ninth wave of SIPP, we have found (1) that Medicaid has significantly positive effects on AFDC participation probabilities and significantly negative effects on work incentives; (2) that such effects arise from the minority of families with high expected medical expenditures rather than from the majority of families, whose AFDC participation probabilities and work levels are not affected by Medicaid; (3) that the data show no evidence of effects of the Medicaid notch on work incentives or disincentives, though possibly for data reasons; and (4) that the availability and probability of receiving private health insurance has a very strong negative effect on AFDC participation and a very strong positive effect on employment probabilities; and (5) that the effect of private health insurance is greater than that of Medicaid.

The fifth finding, that of the stronger effect of private health insurance than Medicaid, could be the result of one or two factors.

First, there is considerable evidence that the quality of care provided to Medicaid recipients is lower than that provided to those with private coverage. Longer waiting times, more difficult scheduling problems, more difficult access, and other such quality characteristics may be lower for Medicaid. If so, female heads should be expected to value a dollar of Medicaid less than a dollar of private health insurance because the former does not capture the true value of the care.

Second, the difference could arise from the phenomenon of welfare "stigma," which arises if female heads have an aversion to welfare receipt. In other contexts, it has been shown that the presence of such stigma leads to an effect of AFDC benefits on work effort that is smaller than an equivalently-sized effect of earnings (Moffitt, 1983). Individuals do not put as high a value on AFDC benefits as on earnings; if offered the same dollar amount of benefits and earnings, they would choose the latter because they prefer not to be welfare recipients (holding all else constant). Likewise, this could lead to a lower effect of Medicaid; if offered the same dollar amount (and quality, let us say) of coverage from a private plan and Medicaid--coupled with AFDC receipt--a female head may choose the former because she prefers, other things equal, not to be a welfare recipient.

D. Simulations

The most robust results of the empirical work are those indicating that AFDC participation rates and caseloads would fall if the overall level of Medicaid were reduced and if the potential value of private health insurance were increased. The same changes would induce effects

of the opposite sign in the probability of employment. To gauge the magnitudes of changes in Medicaid and private health insurance on AFDC participation rates (i.e., the AFDC caseload) and on employment rates, simple simulations can be performed from the prior estimation results. The effects cannot be immediately seen from the prior tables because the coefficients in those tables represent those of a probit equation which must be transformed to obtain effects on the AFDC participation and employment probabilities themselves.

Table 25 shows the effects of several changes in benefit and insurance levels. The first row shows the effects of an increase in the value of Medicaid coverage of $50 per month (in 1984 dollars). This represents a sizable increase, approximately one-third in magnitude. As the table indicates, the Medicaid increase would raise the percent of female heads on AFDC by 2.0 percentage points--implying an increase in the AFDC caseload of 5.9 percent--and would reduce employment rates among female heads by 5.5 percentage points. Thus the caseload and work disincentive effects would not be trivial.

The second row shows the effects on caseloads and work incentives that would result if all female heads were covered by private health insurance if they were to work (37 percent of such women are currently not covered). The results show a 3.5 percentage point reduction in the AFDC participation fraction (10.7 percent reduction in the AFDC caseload) and a 7.6 percentage point increase in the employment rate. The next two rows in the table show the effects of increasing the value of private health insurance (if covered) by $50 per month, the same size as the Medicaid increase in the first row of the table. Under current

Table 25

Effects of Increases in Medical Benefits on AFDC and Employment

	Change in AFDC Participation Rate[a] (Points)	Change in AFDC (Percent)	Absolute Change in Employment Rate[b] (Points)
Increase in Medicaid of $50 per month[c]	2.0	5.9	-5.5
Private insurance for all female workers	-3.5	-10.7	7.6
Increase in private health insurance of $50 per month[d]			
Current coverage levels	-5.3	-15.6	11.7
Coverage for all female workers	-7.3	-21.5	16.0
Increase in private health insurance up to Medicaid levels[e]			
Current coverage levels	-6.0	-17.6	13.3
Coverage for all female workers	-8.3	-24.4	18.1

Notes: Coefficients drawn from third columns of Tables 21 and 22.

[a]Base = 34 percentage points.
[b]Base = 56 percentage points.
[c]Represents 34.5 percent increase in Medicaid index.
[d]Represents 56.5 percent increase in private health insurance if covered.
[e]Represents 64.2 percent increase in private health insurance if covered.

coverage levels (73 percent of workers in the sample are currently covered--see Table 15), this change would have effects in the opposite direction to those of Medicaid that are more than double--the AFDC participation rate would fall by 5.3 percentage points (a 15.6 percent reduction in the caseload) and the employment rate of female heads would rise by 11.7 percentage points. These effects are large and show that private health insurance is likely to have stronger effects on caseloads and work incentives than does Medicaid. But if coverage were 100 percent among workers, the AFDC participation rate would fall by 7.3 percentage points and the employment rate would rise by 16.0 percentage points. The AFDC caseload would thus fall by approximately one-fifth. These are much larger and more important effects.

The final row shows the effect of increasing private coverage to equal that provided by Medicaid. This would generate the largest effects of all--up to a one-quarter decrease in the AFDC caseload if all female workers were covered, and an increase in their employment rate of 18 percentage points.

VII. DYNAMIC ANALYSIS OF SIPP WAVES THREE AND NINE

A. Characteristics of the Sample

The object of the analysis reported in this section is to measure the effect of the Medicaid program on movements on and off the AFDC rolls, and on movements into and out of the work force. The SIPP data permit such an analysis because the SIPP is a panel data set and hence

families are observed repeatedly, and their AFDC participation and employment statuses can be measured at multiple points in time.

As noted previously, the SIPP interviews families every 4 months and asks questions pertaining to their AFDC participation and employment statuses over the prior 4 months. Thus, in principle, a monthly analysis of turnover with SIPP is possible. Unfortunately, the sample sizes available are too small to permit a reliable analysis of this type on specific monthly transitions by themselves. For example, there are 941 female heads with children under 18 in Wave 2 of the SIPP.[20] Of these, 328 were on AFDC. Of the 328 on AFDC, only 22 (7 percent) had moved off AFDC by the next interview at Wave 3. A sample of 22 observations is too small to reliably conduct a study of AFDC transitions.[21]

Our choice is instead to analyze transitional movements over a 2-year period, between Wave 3 and Wave 9. Wave 9 was conducted from April to July of 1986; Wave 3 was conducted at approximately the same time in 1984.[22] Selecting all female heads with children under 18 who were present at both time points yields a sample of 519 women, 1984 of whom were on AFDC at the 1984 date. Of these, 45 (23 percent) had moved off AFDC by the 1986 date 2 years later. Thus both the absolute number and the percentage of transiting observations is greater than in the 4-month interval just discussed.

Table 26 shows the pattern of employment-status and program transitions in the sample. About one-quarter of those on AFDC left the program over the 2-year period and approximately the same number were working the same period, showing once again the close connection between

Table 26

Transitions Between AFDC and Employment Status, 1984 to 1986
(Percentage Distribution)

	AFDC		Employment	
	On	Off	Working	Not Working
AFDC:				
On	77	9	9	60
Off	23	91	91	40
	100	100	100	100
Employment status:				
Working	21	76	88	23
Not working	79	24	12	76
	100	100	100	100

Note: Sample size = 512.

AFDC participation and nonwork. However, less than one-tenth of those off AFDC in 1984 had gone onto AFDC by 1986, although a larger fraction (almost one-quarter) were not working in 1986. About nine-tenths of those working in 1984 were still working on AFDC and about the same number were off AFDC. Of those not working in 1984, almost 40 percent had gone off AFDC by 1986.

Table 27 shows the gains and losses in private health insurance coverage associated with these movements onto and off of AFDC and into and out of the work force in the sample. Of those on AFDC in 1984 and 1986, almost all had no private health insurance coverage in either year, as expected since they were covered by Medicaid. Interestingly, however, 40 percent of those off AFDC in both years did not have private health insurance coverage in either 1984 or 1986 or both; slightly more than one-half of these families had no coverage in either year. Women moving off AFDC often suffered the same fate, for 60 percent were not covered in 1986, the year they were off the rolls. Of those who went onto AFDC, almost 30 percent lost private coverage and two-thirds had no coverage to begin with, in the initial year off the rolls.

Similar patterns appear in the work transitions. Although most workers (90 percent) had coverage in one of the two years, about 30 percent did not have coverage in one of the two years, about 30 percent did not have coverage in one or both years. Of those who stopped working, about one-quarter lost coverage and a large 61 percent did not have coverage in the first year, 1984, when they were working.

Table 27

AFDC Employment Status Transitions by Private Health Insurance Coverage Transition, 1984 to 1986
(Percentage Distribution)

	AFDC Transition				Employment Transition			
	On Both Years	Off Both Years	Went Off	Went On	Working Both Years	Not Working Both Years	Stopped Working	Started Working
Private Health Insurance Coverage								
Covered both years	5	60	9	7	69	8	16	22
Not covered both years	88	21	59	63	10	85	58	48
Lost coverage	0	9	0	30	10	1	23	6
Gained coverage	7	10	32	0	11	6	3	24
	100	100	100	100	100	100	100	100

B. Econometric Model

There are four outcome measures to be analyzed with the econometric model, each of which measures one of the four transitions pertaining to AFDC participation or employment status:

P_{10} = 1 if on AFDC in 1984 and off AFDC in 1986
= 0 if on AFDC in 1984 and on AFDC in 1986

P_{01} = 1 if off AFDC in 1984 and on AFDC in 1986
= 0 if off AFDC in 1984 and off AFDC in 1986

E_{10} = 1 if working in 1984 and not working in 1986
= 0 if working in 1984 and working in 1986

E_{01} = 1 if not working in 1984 and working in 1986
= 0 if not working in 1984 and not working in 1986

Thus each dependent variable is defined to equal 1 if the particular transition is made and 0 if no transition is made.

The independent variables to be used in the econometric model are identical to those in the point-in-time, static model. Just as that model implies that higher AFDC, Food Stamp, and Medicaid benefits should increase AFDC participation and decrease employment status, the same variables should decrease movements off AFDC, increase movements onto AFDC, increase movements out of the work force, and decrease movements into the work force between 1984 and 1986. Higher private health insurance should have the exact opposite effects. Higher values of private, nontransfer nonwage income should increase movements off AFDC, decrease movements onto AFDC, but increase movements out of the work force and decrease movements into it. All income variables are defined as of 1986, and demographic variables defined as of the same time are also entered into the equation.

Preliminary analysis of the data indicated that the addition of part-time and full-time variables to the equations yielded highly unstable and insignificant estimates for all the coefficient estimates, even more so than had been the case in the static analysis. The reason for this instability is again related to the sample sizes of the available transitions, for the number of observations with transitions of the four types just discussed are, respectively, only 44, 30, 31, and 63. With these small numbers of transitional observations, the separate effects of (1) the overall level of benefits and (2) the benefit-reduction rate in each of the programs (AFDC, Food Stamps, and Medicaid) cannot be estimated. Thus, only the zero-hours income variables will be included in the equations and, therefore, only the effects of the overall level of benefits can be determined.

C. Results

The results of the estimations are shown in Table 28. Very few of the coefficient estimates are significant at conventional levels. The coefficients on private income and on AFDC and Food Stamp benefits are uniformly small and have large standard errors. The strongest variables in the equations are those for the Medicaid index in the two equations describing the move onto AFDC and out of the work force. The coefficients on the Medicaid index are significant at the 10 percent level in both equations. Moreover, both coefficients are of the hypothesized sign, with Medicaid acting to discourage movement off AFDC and into the work force and to encourage movement onto AFDC and out of the work force. Indeed, that the most significant coefficients are

Table 28

Probit Coefficient Estimates of Transition Equations

	P_{10}	P_{01}	E_{10}	E_{01}
Private income	-0.002	0.001	-0.001	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)
AFDC benefits	0.001	0.012	0.002	-0.001
	(0.005)	(0.008)	(0.007)	(0.004)
Food Stamp benefits	-0.008	0.007	0.005	-0.001
	(0.007)	(0.010)	(0.009)	(0.006)
Medicaid index	-0.001	0.012*	0.021*	-0.001
	(0.003)	(0.005)	(0.012)	(0.003)
Private insurance index	0.010	-0.015	-0.048*	0.005
	(0.012)	(0.010)	(0.022)	(0.007)
Sample size	192	320	253	259

Notes: Standard errors in parentheses.
*Significant at 10% level.
All income variables measured at zero hours in 1986.
P_{10} = On AFDC to Off AFDC.
P_{01} = Off AFDC to On AFDC.
E_{10} = Working to Not Working.
E_{01} = Not Working to Working.

those representing the movement onto AFDC and out of the work force suggests that the major effect of Medicaid may be on the transition onto AFDC rather than on the transition off AFDC. If this is the case, it implies that the Medicaid transition provisions--which are designed to affect the transition off AFDC--may not have as great an effect as policies designed to discourage movements onto AFDC.

The coefficients on the private health insurance indexes are, like those on the Medicaid indexes, of stronger signs and significant levels than the other income variables. The index coefficient is significant at conventional levels in the equation representing the movement out of the work force and is on the borderline of significance in the equation representing the movement onto AFDC. Once again all coefficients are of the hypothesized sign, indicating that private health insurance discourages entry onto AFDC and movement out of the work force and encourages exit from AFDC and movement into the work force. The combination of these results with those of the Medicaid variables suggests that the provision of private health insurance may have more of an effect than the Medicaid transition provisions because private health insurance provides a strong attraction to stay in the work force in the first place.

These conclusions must be tempered by the relative weakness of the significance levels of the coefficients. The fact that the coefficients on the Medicaid and private insurance indexes are of the expected sign even when insignificant--and are always consistent with the static analysis reported in the Section VI--and yet have high standard errors, is an indirect indication that the sample sizes are not sufficiently

large to provide reliable results. Indeed, the Medicaid coefficient with the highest t-statistic is found in that equation with the largest sample size. To provide firmer results requires use of a different sample, either utilizing additional waves of SIPP or data from a different source. Nevertheless, they do provide the first clear evidence of an important role of Medicaid and of offering private health insurance in the AFDC and work choices of single workers.

VIII. SUMMARY AND CONCLUSIONS

This study has conducted a statistical examination of the effects of the Medicaid program on welfare dependency and work effort. Using 1984-1986 data from the Survey of Income and Program Participation on female heads of family, participation in the AFDC program and participation in the work force were related to both the Medicaid program and private health insurance coverage. A unique aspect of our study was the construction of a variable for the family-specific valuation of the Medicaid program, based upon family health characteristics and other sociodemographic characteristics. A similar variable for the family-specific valuation of private health insurance was constructed based upon the same set of characteristics.

Several important results were found. First, there is evidence that the Medicaid program exerts strong incentives to be on the AFDC program and strong disincentives to enter the work force. This is not perhaps surprising in light of the importance of health care to the low-income population and to female-headed families in general. Second, however, it was also found that these incentives and disincentives were

concentrated in the minority of families with the worst health conditions and hence the highest valuation of the Medicaid program. For the majority of the female-headed families we examined, Medicaid had little or no effect on the propensity to be on AFDC or on the likelihood of working. The minority of families with the highest expected medical expenditures are those who need the Medicaid program the most and for whom it is no doubt extremely expensive to obtain comparable coverage in the private sector, even when working.

We also found that the availability and level of private health insurance exerts strong effects on the likelihoods of AFDC participation and of participating in the work force. A higher expected private health insurance value, either from a higher probability of being covered at the place of employment or from a higher value if covered, gives female heads a strong incentive to leave the AFDC rolls and to enter the work force. The magnitudes of these incentives are considerably stronger than incentives in the opposite direction exerted by Medicaid benefits. Our estimates imply that full private health insurance coverage for female workers and their dependents at current benefit levels would reduce the AFDC caseload by 11 percent. They also imply that an increase in private health insurance benefit levels up to Medicaid levels subsequent to coverage for all working women would reduce the AFDC caseload by an additional 13 percent, or about a one-quarter reduction in the caseload in total.

We also analyzed the effect of the Medicaid program and private health insurance on movements onto and off of the AFDC program, and into and out of the work force. Our major finding in this analysis was that

the strongest effects on work-welfare turnover are in the transition onto AFDC and the transition out of the work force. Thus, for example, higher levels of expected medical expenditures from Medicaid usage lead to significant increases in the rate of entry onto the AFDC program and significant increases in the rate of exit from the work force. These effects are much stronger than those on the exit rate from AFDC and the entry rate into the work force. Likewise, private health insurance exerts its major effects on the AFDC entry rate and the exit rate from the work force. These findings are of some importance because the Medicaid transition rules currently in place and those to be implemented under the Family Support Act are designed instead to affect AFDC exit rates and work force entry rates.

Finally, our examination of the effects of the Medicaid notch on AFDC participation rates and propensities to participate in the work force found no significant effects of the notch on work incentives and only a small incentive to leave AFDC. Thus, overall, our estimates of the effects of the Medicaid notch on behavior showed very weak if not zero effects. However, our analysis revealed methodological difficulties in evaluating its effects. To separate the effects of the notch from the effects of the level of Medicaid benefits per se requires that the implicit benefit reduction rate on Medicaid benefits vary across the population. But since Medicaid benefits are provided at the same level to the AFDC family regardless of its earnings--so long as AFDC eligibility is maintained--there is no variation in Medicaid benefits over different levels of earnings. Specifically, working AFDC recipients receive the same amount of Medicaid coverage as do nonworking

AFDC recipients. Thus, it appears that a more definitive determination of the effects of the Medicaid notch must await the evaluation of either a demonstration or a modification in the program (such as that embodied in the Family Support Act) that provides the needed variation in the Medicaid benefit-reduction rate.

Appendix Table A-1

Variable Descriptions, Means, and Standard Deviations
Mothers-NMCUES Data
N = 554
(Calendar 1980 Amounts)

	Mean	Standard Deviation
2 + visits	5.57	9.12
3 + visits	4.88	8.94
4 + visits	4.32	8.70
7 + visits	3.12	7.91
13 + visits	1.83	6.33
Northeast	.22	.42
Northcentral	.23	.42
South	.33	.47
Medicaid	.32	.47
Private	.45	.50
2 + nights hospital	1.02	3.48
4 + nights hospital	.73	3.02
7 + nights hospital	.45	2.44
Value of visits	150.68	272.04
Value of hospital care	253.47	1007.52
Value--other medical care	13.14	77.85
Total value of health care	565.51	1324.97
Other Characteristics (for comparison purposes):		
Age	33.41	9.71
Total charges	754.38	1533.84
White	.63	.48
Head of household	.81	.39
Divorced-widowed	.50	.86
Never married	.19	.80
Household size	3.89	1.65

Appendix Table A-2

Variable Descriptions, Means, and Standard Deviations
Children-NMCUES Data
N = 1033
(Calendar 1980 Amounts)

	Mean	Standard Deviation
Age	9.13	4.99
White	.59	.49
Mother's Characteristics		
Mother's age	33.69	8.53
Never married	.16	.70
Divorced or widowed	.50	.77
Education (coded)	3.74	1.1
Head	.87	.34
Poor or fair health	.22	.41
Inpatient nights	1.25	3.68
Outpatient visits	6.34	9.03
Household size	4.36	1.62
Mother works	.51	.50
Income $\leq$ poverty line	.42	.49
Own Characteristics		
Physical disability	.05	.21
Disabled	.06	.24
Medicaid	.37	.48
Private	.39	.49
Bed days per year	4.03	7.23
Nights in hospital	.39	1.88
Total charges	284.40	880.60
Total value	225.99	846.61

Appendix Table A-3

Estimates of the Wage Equation
(SIPP Wave 9)

Education	0.057* (0.009)
Age	0.114* (0.024)
Age squared	-0.164* (0.032)
Experience	0.057* (0.011)
Experience squared	-0.088* (0.038)
Constant	-1.629 (0.359)

Notes: Standard errors in parentheses.

*Significant at 10% level.

Dependent variable: log of hourly wage rate.

Estimated jointly with a probability-of-working equation.

Appendix Table A-4

Probit Coefficients on Nonincome Variables[a]

	AFDC Participation	Employment Status
Age	-0.112*	0.200*
	(0.066)	(0.061)
Age squared	0.132	-0.259*
	(0.092)	(0.079)
Race (1 = nonwhite)	0.447*	-0.301*
	(0.146)	(0.138)
Health (1 = poor or fair)	0.278*	-0.335*
	(0.146)	(0.135)
Education	-0.079*	0.079*
	(0.031)	(0.025)
Family size	-0.267*	0.183*
	(0.102)	(0.089)
No. children 0-5	0.409*	-0.437*
	(0.125)	(0.127)
No. children 6-12	0.090	-0.080
	(0.096)	(0.089)
South	0.011	0.129
	(0.258)	(0.237)
Midwest	0.449*	-0.267
	(0.216)	(0.197)
West	0.086	-0.014
	(0.229)	(0.219)
Constant	1.437	-3.413
	(1.089)	(1.092)

Notes: Standard errors in parentheses.

*Significant at 10% level.

[a]For specification (1) of Tables 19 and 20.

Notes

[1]The figures for Medicaid and AFDC recipients are not completely comparable because the former refers to the number of female heads having received Medicaid any time during the year whereas the latter refers to the average monthly number of recipients. This is no doubt the reason for the above-100-percent ratios.

[2]Blank also estimated equations for hours of work but did not report equation estimates including the Medicaid variable.

[3]The current statutory benefit-reduction rate is 67 percent for 4 months and 100 percent thereafter, although there are several income-related deductions as well. The figure assumes a rate somewhere between these two.

[4]This theoretical analysis is closely related to the effects of lowering the benefit-reduction rate, which also has ambiguous effects on work effort. See Levy (1979) and Moffitt (1987).

[5]According to several studies, health is one of the best predictors of medical care utilization (see, for example, Andersen and Newman, 1973).

[6]In econometric terms, our index should be thought of as an instrumental variable--correlated with the true value but not equal to it. Note as well that the coefficient on our index in a labor supply or AFDC participation equation will reflect, in part, its cash-equivalent value. A one dollar increase in the value of an in-kind benefit generates a smaller effect than a one-dollar increase in cash (see Moffitt, 1989, for a proof).

[7]No adjustment is made in the index for premium payments for insurance.

[8]We do not predict insurance coverage for children since children are not the decision makers; hence, coverage is exogenous to the children, and is so treated.

[9]While the approach for children is more straightforward, the approach is not used for mothers because it does not make use of the more extensive set of variables available on SIPP compared to NMCUES.

[10]These results are consistent with those of Blank (1989). A priori the sign is ambiguous. Medically needy coverage increases eligibility but also provides back-up coverage which might increase willingness to leave Medicaid's categorical coverage.

[11]The variables included in these equations are those of equation (1). Certain variables important for insurance--such as whether the state has a medically needy program and AFDC benefit standard, whether child support is received, and home ownership--are not included. The last, home ownership, may reflect assets and hence eligibility for Medicaid.

[12]This result is consistent with the idea of patterns of care and suggests that in areas with higher use, these women are part of the pattern.

[13]This result is consistent with those of the Rand Health Insurance Experiment (see Manning et al., 1987).

[14]Coverage generally differs by industry and so inclusion of industry should improve the fit of the equation. Unfortunately, we cannot predict accurately the industry for women not in the labor force and so cannot use this better estimate for the index.

[15]Food Stamp benefits are constant nationwide but vary with family size and nonwage income. Since both the latter variables are in our

regression, the coefficient on Food Stamp benefits will be identified only through nonlinearities and therefore may be poorly identified.

[16]Some of this 31 percent may be an error in measurement, for assets data are not available in sufficient detail in the SIPP or other household surveys to adequately apply the program resources tests.

[17]The wage-equation estimates are reported in Appendix Table A-3.

[18]Despite the presence of variable child-care expenses, the implicit AFDC benefit-reduction rate used is very close to 100 percent

[19]All results reported in the following tables are unweighted. Weighted estimates were also obtained and showed virtually identical coefficients.

[20]This sample size is considerably larger than that at Wave 9 because of attrition and because the SIPP sample size was cut midway through the survey. However, it excludes rotation group 3.

[21]We had originally planned to compare transitions between Waves 2 and 3 to transitions between Waves 8 and 9, since the transition rules enacted under DEFRA were put into place between these two pairs of waves. Unfortunately, the sample sizes do not permit such an analysis. In addition, as noted previously in this report, the number of families receiving transitional benefits under the DEFRA legislation is very small, making it unlikely that its impact, if any, could be detected with (for example) 22 observations.

[22]Unfortunately, a rotation group was temporarily dropped in the middle of the SIPP. This rotation group (group 3) was not included in any of the analysis below.

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