Labor Supply and Participation Effects of the Earned Income Tax Credit: Evidence from the National Survey of America's Families and Wisconsin's Supplemental Benefit for Families with Three Children

Maria Cancian
University of Wisconsin–Madison
Cancian@LaFollette.wisc.edu

Arik Levinson
Georgetown University
aml6@georgetown.edu

September 2003

Acknowledgments

The authors are grateful to the Association for Public Policy and Management (APPAM) for support through the NSAF Small Research Grants Program, to Sjamsu Rahardja for research assistance, to Elizabeth Evanson and Dawn Duren for assistance in preparing this manuscript, and to Karl Scholz for helpful discussions.

Labor Supply and Participation Effects of the Earned Income Tax Credit: Evidence from the National Survey of America's Families and Wisconsin's Supplemental Benefit for Families with Three Children

Abstract

We examine the labor market consequences of the Earned Income Tax Credit (EITC), comparing labor market behavior of eligible parents in Wisconsin, which supplements the federal EITC for families with three children, to that of similar parents in states that do not supplement the federal EITC. Most previous studies have relied on changes in the EITC over time, or EITC eligibility differences for families with and without children, or have extrapolated from measured labor supply responses to other tax and benefit programs. In contrast, our cross-state comparison examines a larger difference in EITC benefits among families with two or three children.

JEL Codes: H24, H73, J38**.**

Keywords: Earned income tax credit, National Survey of America's Families, labor force participation.

Labor Supply and Participation Effects of the Earned Income Tax Credit: Evidence from the National Survey of America's Families and Wisconsin's Supplemental Benefit for Families with Three Children

The Earned Income Tax Credit (EITC) is the largest federal means-tested antipoverty program in the United States. Federal EITC tax expenditures in 1999 were $31 billion, almost as much as for the Food Stamp and Temporary Assistance for Needy Families (TANF) programs combined. Nearly 19 million federal tax returns claimed the EITC. By contrast, 6 million people participated in TANF, and 18 million received food stamps.[1]

In 1999, families with two children could receive a refundable 40 percent federal income tax credit for each dollar of earned income up to $9,540. Taxpayers earning between $9,540 and $12,460 received the maximum possible federal credit of $3,816 (0.40 times $9,540). Beyond $12,460, each dollar of earnings reduced the EITC by 21.06 cents. In addition, 15 states offer supplemental tax credits based on the federal EITC.[2]

What does the U.S. government receive for this expenditure? Two goals are typically ascribed to the EITC: (a) to redistribute income to working poor families, and (b) to encourage labor supply. While the first is unambiguously achieved, the second is theoretically and empirically less certain.

This paper measures the labor supply consequences of the EITC, using data from the National Survey of America's Families and focusing on Wisconsin's supplement to the federal EITC for families with three or more children. While empirical studies of the EITC's labor market consequences exist, most examine changes in the federal rate over time. In many cases these changes are fairly small. For example, Eissa and Liebman (1996) investigate the 1987

expansion of the federal EITC from 11 to 14 percent. In contrast, a three-child family in Wisconsin receiving the EITC will receive a tax credit that is 43 percent larger than that received by a comparable family in a state with no supplemental credit. More recent studies of EITC changes gradually phased in during the 1990s face the additional challenge of separating the effect of the EITC from general time trends. Finally, most previous studies rely on a comparison of women with and without children. In contrast, because the Wisconsin supplement varies by the number of children, we compare women with two and three children– which we argue provides a more satisfactory control group.

Theory

The theoretical effects of the EITC on labor supply, abstracting from all other sources of income, can be summarized by the static labor supply diagram in Figure 1. That figure depicts the choice between income, on the left axis, and working hours, on the bottom axis, where working hours increase from right to left. A person not working earns zero, while a person working all available hours earns their wage rate times the number of available hours. The slope of the solid diagonal budget line is thus the wage.

The dotted line in Figure 1 depicts the sum of earned income and the EITC, and so its slope at point $\boldsymbol{A_2}$ is 1.4 times the wage rate. At earned income of $9,540 in 1999 the federal EITC is capped, and so the dotted budget line runs parallel to the earned income budget line, with a slope at $\boldsymbol{B_2}$ equal to the wage rate. Above $12,460, tax credits are reduced by 21.06 cents for every dollar earned, and so the slope of the dotted line at point $\boldsymbol{C_2}$ is 0.7894 times the wage rate.

The effects of this tax program on labor supply can be broken into two parts: (a) participation, the decision whether or not to work at all, and (b) supply, the number of hours to work. The first effect, on participation, is theoretically unambiguous. The credit is only earned by workers, and therefore increases the payoff to working relative to not working. Any single parent who would choose to work in a world without the EITC will also choose to work in an otherwise identical world with an EITC.[3] On the other hand, some individuals not working in the absence of the EITC will prefer to work if there is an EITC. The program thus provides clear incentives to work.

The second effect, on hours worked, is ambiguous. A person with low wages, or working small numbers of hours, is depicted in Figure 1 with indifference curves A_1 and A_2. The EITC amounts to an increase in the after-tax wage rate (by 40 percent for parents with two children), with offsetting income and substitution effects. The income effect of the wage increase gives individual ***A*** the incentive to work less (assuming leisure is a normal good), while the substitution effect increases the opportunity cost of leisure and gives ***A*** the incentive to work more. Individual ***B***, on the other hand, receives a pure lump-sum transfer (of $3,816 in 1999 for families with two children). This has pure income effects that unambiguously decrease desired work hours. Finally, individual ***C***, in the phase-out range of the EITC, effectively receives a lump-sum transfer plus a decrease in the after-tax wage rate. Both the income and substitution effects unambiguously decrease desired hours.

Collectively, the labor market incentives of the EITC are mixed. The program has unambiguously positive theoretical effects on participation but, conditional on participation, the program has largely negative effects on hours worked.

Finally, there are reasons to believe that all of these effects will be muted by complexities and lags in the tax code. Tax credits for income earned in one year are not received until taxpayers' EITC forms are filed in the following year.[4] Workers' limited understanding of the EITC may also reduce their responsiveness.[5] For all of these reasons, the size of the actual effect of the EITC on labor supply and participation is an empirical question.

Previous Studies

Most existing work on the EITC relies on changes in the program's benefits, especially the 1987 and 1993 expansions. So as not to confound the effects of the EITC expansions with other changes in labor market conditions, these studies typically contrast changes in labor market behavior of eligible taxpayers before and after the EITC expansion to that of ineligible taxpayers. Eissa and Liebman (1996), for example, compare the labor supply of single mothers to that of single women without children. Meyer and Rosenbaum (2000) compare single mothers to single childless women, married women, and black men. These differences-in-differences strategies assume that any changes in labor market conditions that occur simultaneously with increases in EITC benefits do not affect single mothers and the comparison groups differently.

A second problem with these approaches is that the comparison groups typically have very high labor force participation. Of the women with no children that Eissa and Liebman use as a control group, 95 percent were working at the time of the 1987 EITC expansion. Any general increase in labor force participation, therefore, is much more likely to be experienced by the women with children, of whom only 75 percent were working. Meyer and Rosenbaum restrict

their sample to those with no more than a high school education, where labor force participation rates are lower and these ceiling effects are less important.

Another set of empirical papers has attempted to estimate more structural models of labor supply as a function of the after-tax wage rate, and then used the EITC's separate effect on the after-tax wage to predict labor supply responsiveness to the EITC specifically. This approach assumes that administrative differences between the EITC and other tax provisions (such as the fact that the EITC credit is not realized until tax forms are filed the following year) do not affect labor supply responsiveness.

In a recent paper, Meyer and Rosenbaum (2001) estimate a structural model of labor supply in an effort to estimate the effects of the EITC as well as other policies targeting low-income families, including AFDC, Food Stamps, Medicaid, and child care and training programs. In their preferred specification they find that employment is responsive to changes in total taxes. They include all single women, allowing the effects of taxes to be identified through differences between women with and without children. They also estimate the model on a sample that includes only single mothers, with identification resting on differences across states and numbers of children. In this case the estimated effects are substantially smaller, and are only significant using one of two data sources.

Neumark and Wascher (2000) estimate the effect of changes in the EITC on changes in employment, earned income, and official poverty status–the focus of their analysis. They match March CPS files from 1986 to 1995 in two-year pairings in order to observe changes in labor supply and earned income for individual families. Among families with no worker in the first year, increases in the EITC are associated with increased employment in the second year.

However, among families with a worker in the first year, increases in the EITC are associated with declines in total hours worked.[6]

In general, these studies tend to find small negative effects of EITC expansions on hours worked, and large (sometimes surprisingly large) effects on participation. For example, Eissa and Liebman find a statistically insignificant effect on hours worked, and a 2.8 percentage point increase in labor market participation by single parents. Meyer and Rosenbaum (2001) conclude that 62 percent of the increase in single mothers' employment between 1984 and 1996 was due to the EITC–although the estimated effect falls by about half when using the estimates from the specification using only single mothers.

In sum, the empirical literature to date suffers from a number of acknowledged drawbacks. Some studies examine relatively small changes in the EITC program that may be confounded with concurrent changes in other labor market conditions. Other research extrapolates from general after-tax wage elasticities that may not be relevant given the peculiarities of the EITC. Few researchers have yet examined the largest source of variation in EITC benefits: the cross-state variation in state EITC supplements, particularly the differences in supplements for additional children. To our knowledge, none have considered this variation in the period since TANF implementation substantially altered the incentives for single mothers to work.

Hotz and Scholz (2001) argue that "probably the most powerful way to look at EITC labor market effects is to look at differences in labor market patterns for families with one and two-or-more children starting in the mid 1990s (when the discrepancies began to get large)." To date the only paper to explore these differences is Hotz, Mullen and Scholz (2002). They

examine the 1994 expansion of the federal EITC from 18.5 percent to 34 percent for families with one child, and from 19.5 percent to 40 percent for families with two or more children. They note that the difference between the EITC for 2 and 1-child families increased from 1 percent (19.5 minus 18.5 percent) to 6 percent (40 minus 34), and that controlling for other family characteristics this difference was associated with a 6 percent increase in labor force participation. Roughly speaking, the labor force participation elasticity they estimate (1.2) falls at the high end of previous estimates.

We take the Hotz and Scholz strategy one step further by looking at the even larger differences in the supplemental EITC benefits provided by individual states. Consider, for example a single parent with three children in Wisconsin earning $8,000 in 1999. She would be eligible to receive a federal EITC credit of $3,200 (40 percent), and a state credit of another $1,376 (43 percent of the federal credit). An otherwise identical parent in Ohio, or Indiana, or any of the 35 states that do not have their own EITC programs, would receive only the federal credit of $3200. To put this in perspective, the Wisconsin supplement (17.2 percent in this case–43 percent times 40 percent), is larger than the entire maximum federal EITC benefit when Eissa and Liebman examined the expansion in 1987 from 11 to 14 percent, and more than three times as large as the 5 percent difference used by Hotz, Mullen and Scholz.

The advantage of using EITC variation across states rather than across time can be seen in Figure 2. Most papers on the EITC contain a figure similar to Figure 1, where the vertical axis is exaggerated for the sake of exposition. By contrast, the top panel of Figure 2 displays the actual federal EITC and the Wisconsin supplements on a set of axes that are not exaggerated. The Wisconsin supplement, though noticeable on the graph, is not dramatic. The bottom panel of

Figure 2 displays the federal EITC before and after the 1987 expansion, which serves as a source of identification for Eissa and Liebman. Here, the difference between the pre- and post-expansion returns to labor are much less noticeable.[7]

NSAF and Wisconsin's EITC Supplement

This paper is the first to use the National Survey of America's Families to examine labor supply and the Earned Income Tax Credit.[8] Though comparable in size to the Current Population Survey (CPS), used by Eissa and Liebman and Meyer and Rosenbaum, the NSAF oversamples low-income families and families in 13 states, 5 of which have state EITC supplements. Of particular interest is the NSAF oversample of Wisconsin, which provides the largest state EITC supplement, and the only one that differentially affects families with three children. Thus, the NSAF allows us to assess labor market effects of the EITC using cross-state variation in the treatment of families with two and three children. (The construction of our sample is described in Appendix Table A.)

Table 1 begins to sketch the empirical strategy we use to identify the labor market effects of the EITC, in a simple differences-of-means framework without controlling for other demographic characteristics of families or other state policy differences. Table 1A presents the labor force participation rates for single women aged 19 to 44, with incomes below 300 percent of the federal poverty line, using pooled 1997 and 1999 NSAF data.[9] We show results for two measures of employment status: current employment, and whether the respondent worked at any time last year. As discussed above, the EITC has a theoretically unambiguous positive effect on the decision to work, but has ambiguous effects on total hours worked. The clearest test of the

effect on the decision to work is therefore an analysis of any work in a given year, since a change in hours may result in changes in hours worked in a given week, or in the weeks worked in a given year. (The EITC is calculated with reference to annual earnings.) On the other hand, a very high proportion of mothers work at some point during the year, potentially leaving less room to observe an EITC effect on participation.[10]

Low-income single mothers in Wisconsin with two children were eligible for up to a 45.6 percent tax credit on earnings (40 percent federal credit plus 14 percent state supplement, where the state supplement is a fraction of the federal credit). The first column of Table 1A shows that 84 percent of this group was working at the time of the survey. By contrast, working single parents with three children in Wisconsin were eligible for up to a 57.2 percent credit (40 percent federal plus 43 percent state), and 83 percent of this group worked at the time of the survey. Though the difference (-0.008) seems to suggest that the EITC supplement for three children discourages labor force participation, it is tiny and not statistically significant, and we must recognize the unequal private work incentives for two-child and three-child families.

To provide a basis for comparison, the second row of Table 1A examines participation rates for similar families in states that do not supplement the federal EITC. The labor force participation of three-child families is smaller than that of two-child families by 9 percentage points. The smaller difference between the participation rates in row 1, where having a third child increases the EITC from 14 to 43 percent of the federal level, than in row 2, where a third child adds nothing to the EITC, is consistent with Wisconsin's EITC supplement increasing labor force participation by eligible parents with three children by 8 percent.

The second part of Table 1A presents a parallel analysis of employment, in this case considering the proportion of mothers who worked at any time during the previous year. Employment levels by this definition are higher, but the differences by number of children and state are similar. In Wisconsin single mothers with three children are only slightly less likely to work than those with two children, and the difference is not statistically significant. In states that do not have an EITC supplement, employment rates are significantly lower among mothers with three children. Here the smaller difference between the participation rates in row 1 than in row 2 is consistent with Wisconsin's EITC supplement increasing labor force participation by eligible parents with three children by 3 percentage points. This difference, however, is not statistically significant.

Table 1B conducts the same exercise for hours worked. Low-income working single mothers in Wisconsin with two children worked an average of 39.1 hours per week. By contrast, working single mothers with three children in Wisconsin worked an average of 39.5 hours per week. For comparison, the second row of Table 1B examines the average weekly work hours for similar families in states without EITC supplements. On average, low-income single working women with two children in such states worked 38.3 weekly hours, while families with three children worked 37.8 hours. One interpretation of these results would be that without the third-child EITC supplement, working families in Wisconsin would have worked fewer hours. In other words, the difference between three-child and two-child families in Wisconsin is larger than outside Wisconsin. This difference-in-differences (+0.89 hours), however, is again not statistically significant.[11]

Tables 1A and 1B do not control for other demographic differences between small and large families or between Wisconsin families and those of other states. Nor do those tables control for differences among states other than their EITC schedules. For this reason, we have also estimated versions of

(1) $$Y_i = \alpha + \beta_1(WI) + \beta_2(3\ kids) + \beta_3(WI)*(3\ kids) + \beta_4 \mathbf{X_i} + \epsilon_i$$

where Y_i is the outcome of interest (e.g., hours worked) for household *i*, *WI* is a dummy variable equal to 1 for households in Wisconsin, *3 kids* is a dummy variable for households with three children, and $\mathbf{X_i}$ are characteristics of households and states, including age, education, health, race, state unemployment rates, and state welfare policies. If these additional covariates are not included (X_i=0), then the coefficient on the interactive term (β_3) will be exactly equal to the difference in differences in Table 1B (0.89). Including those other characteristics estimates the differential effect of Wisconsin's large third-child supplement while controlling for other important family and policy differences.

One concern with comparing Wisconsin to other states is that there may be some feature of Wisconsin policy or Wisconsin residents that makes labor supply behave differently in that state. By comparing the labor supply of women with two children to that of women with three children in Wisconsin and in comparison states, we ameliorate some of that problem. To the extent that features of Wisconsin's economy or policy environment influence mothers' employment in general, these state-specific effects will not bias our estimates of the difference in employment rates for mothers with two or three children. However, there may be reasons beyond the EITC supplement why having a third child has different effects on labor supply in Wisconsin

than in the comparison states. Two obvious candidates are state welfare policy and state child care policy.

On both counts, Wisconsin's policies potentially exaggerate the differential labor supply of low-income women with larger families. The first concern is accounting for differences in state AFDC and TANF benefit increases for larger families. Under AFDC, cash benefits increased with family size in every state. With the implementation of TANF, all but a few states continued to pay larger cash benefits to families with more children. In Wisconsin, however, TANF cash benefits do not depend at all on the number of children. To the extent that we find Wisconsin mothers with three children more likely to work, that result may be due to the generosity of Wisconsin's EITC supplement or to the lack of a family size adjustment in its cash welfare program.[12] To account for this, we include in our estimates of equation (1) a measure of maximum state AFDC/TANF benefits.

A second factor that may systematically alter the work incentives of families of different sizes is the availability and cost of subsidized child care. In the absence of subsidized care, families with more young children face higher work-related child care expenses. Wisconsin offers relatively generous child care subsidies and has high rates of subsidized child care use. Since reducing the cost of child care should be particularly important for larger families, Wisconsin's child care policy may further exaggerate our estimates of the effect of the EITC supplement on the labor supply of women with more children. Thus, in our estimates of equation (1) we include two measures of the availability and generosity of child care subsidies: total expenditures on child care per poor child under the age of 13, and total preschool and Head Start spending per child under age 6.[13]

While our model includes state and family size-specific measures of cash benefits and child care subsidies, we cannot be confident that our measures perfectly capture the influence of these policies on the labor supply of two and three child families in Wisconsin and other states. To the extent that we fail to fully account for these policies, our estimates of the labor supply effect of the EITC may be upwardly biased– since both child care and cash benefit policies would also create a greater incentive for families with more children to work at higher rates in Wisconsin than in most other states.

Table 2 presents estimates of equation (1). In column 1 we show the means and standard deviations of the control variables for the entire population of working and nonworking single mothers. (Again we limit the sample to women with incomes below 300 percent of the federal poverty line, having either two children or three children, and living in either Wisconsin or comparison states without EITC supplements.) Columns 2 and 3 contain estimates for a probit regression of current employment participation, defined by being employed at the time of the survey. Columns 4 and 5 contain estimates for a probit regression of annual employment participation, defined by having worked in the year prior to the survey. Finally, column 6 has results from an OLS regression of weekly hours worked.

Turning to the first row of Table 2, we see that 22 percent of this sample live in Wisconsin. The Wisconsin mothers do not work significantly more weekly hours, but are more likely to work. The probit coefficient suggests that mothers in Wisconsin are 6 to 9 percentage points more likely to be working–either at a point in time, or at some point in the year–than otherwise similar women in the comparison states.

Thirty-four percent of the sample has three children, with the remainder having two children. Women with a third child do not work significantly more or fewer weekly hours than are worked by women with two children, but they are less likely to be working at a point in time, or at any time during the year. The probit coefficients suggest that having a third child reduces the probability that a single mother works by 3 to 6 percent. If child care costs increase with the number of children, this makes perfect sense.

The key coefficient is that on the interaction between the Wisconsin dummy and the third child dummy, because only in Wisconsin does the state EITC supplement increase with the addition of a third child. The coefficient on hours worked in column 6, 0.67, is both small and statistically insignificant. This is unsurprising, given the ambiguous theoretical effects of the EITC on labor supply.

The EITC does, however, have unambiguous theoretical effects on labor force participation. The relevant interaction coefficients from columns 2 and 4 of Table 2 are 0.227 (for currently employed) and 0.063 (for worked last year). Though statistically insignificant, the point estimates suggest that having a third child in Wisconsin increases the probability of working by 1.5 to 5.4 percentage points, relative to having a third child in a state without an EITC supplement.

Comparisons with Previous Results

Eissa and Liebman found that women with children increased their labor supply after the 1987 EITC expansion by 1.9 percentage points. That was in response to an increase in the federal EITC from 11 to 14 percent, or a 2.7 percent increase in the total labor compensation. By

contrast, we find a (statistically insignificant) increase in labor supply of 1.5 to 5.4 percent in response to an 8 percent increase in the EITC.[14] Roughly speaking, Eissa and Liebman estimate a statistically significant labor participation elasticity of 0.70, while our insignificant point estimate of that same elasticity is 0.19 to 0.67.[15] Meyer and Rosenbaum (2001:1089–92) estimate that a $1,000 decline in annual taxes increases employment by 2.7 to 4.5 percentage points, implying elasticities of .83 to 1.07. And, Hotz, Mullen and Scholz estimate that a $1000 increase in the EITC would increase participation by 5 percent, yielding an elasticity of approximately 1.2.

Our analysis compares the labor force participation of single mothers with two and three children. We include measures of child care subsidies and welfare benefits because these are the two state policies that we particularly suspect would differentially affect families of different sizes, since child care costs generally increase with the number of children and since there is substantial state variation in the extent to which welfare benefits vary with family size. In other respects we expect that single-mother families with two and three children are more comparable than, for example, single women with and without children. A comparison of basic demographic characteristics of women by maternal status and number of children confirms this expectation– as suggested by Appendix Table A2. In this context it is noteworthy that when Meyer and Rosenbaum (2001) restrict their analysis to single mothers, relying on variation across states and number of children to identify the effects of taxes, the estimated effects of the EITC are smaller, and only significant for one of the two samples they use.

Following Neumark and Wascher (2000), we also estimated our model on subsamples of women with incomes less than 200 percent and less than 100 percent of the federal poverty line. Table 3 shows the coefficient estimates for the effect of the interaction of Wisconsin residence

and having three children for each of these subsamples. Consistent with Neumark and Wascher's results, we find larger participation elasticities for those with incomes less than 100 percent of the poverty line, though the estimate is only statistically significant for current employment, reported in column 1.

Table 3 also includes two alternative specifications. The first compares single mothers with one or two children to single mothers with three or more children. This almost doubles the sample size, while blurring somewhat the distinction between the two groups. The larger sample size does not yield a more statistically significant coefficient in any of the three specifications, and the inclusion of other family sizes renders the point estimates smaller. Second, we include in the comparison groups states that do have an EITC supplement (though none differentiate between two-child and three-child families). Again, the increase in sample size is offset by the fact that the distinction between the groups is less sharp.

The last sensitivity analysis in Table 3 explores sample selection. Throughout the analyses we have limited our sample to low income single mothers, the group most likely to be affected by the EITC. One might worry that we have therefore selected on an endogenous variable. Mothers who choose not to work have low incomes and low labor force participation rates. At the bottom of Table 3 we estimate the basic specifications from Table 2 with women of all incomes with a high school education or less. None of the coefficients on the key regressor (the Wisconsin dummy interacted with the 3-child family dummy) is statistically significant or large.

Finally, note that we use two measures of employment–current employment and worked last year. These are similar to the measures used by Meyer and Rosenbaum (2001), who point out

that any employment in the last year should provide a sharper test of the theory, since the EITC has a theoretically unambiguous effect on ever working in a tax year, but an ambiguous effect on employment in any given week during the year. Despite the theoretical predictions, we estimate statistically insignificant effects using both definitions, though the point estimate of the marginal effect is larger for current employment. We find statistically significant effects for a sample of women with income below the poverty line, but again only when we consider current employment. One possible explanation is that annual employment rates are so high, particularly in Wisconsin, that it is difficult for the EITC to have a discernible effect. Meyer and Rosenbaum generally find larger effects for their annual measure, and when they restrict their analysis to single mothers, only find statistically significant effects using the annual measure.[16]

Conclusion

A key goal of the EITC is to redistribute income to working poor families. In practice, the EITC is an important income source for many vulnerable families, including many single-mother families making the transition from welfare to work under recent welfare reforms (Johnson, 2000; Cancian et al. forthcoming). To many analysts, the EITC is preferable to other programs aimed at low-income families because it is tied to work. For families with a single worker earning low wages, the more hours worked, the greater their EITC. Thus, given its basic structure, the EITC unambiguously serves to target resources to low-income working families.

A less certain advantage of the EITC is its ability to increase labor supply. We use the National Survey of America's Families to examine the labor market consequences of the EITC by comparing the labor market behavior of eligible parents in Wisconsin, which supplements the

federal EITC for families with three children, to the labor market behavior of otherwise similar parents in states that do not supplement the federal tax credit. We find some evidence of increased employment; however, for most samples and specifications that effect is not statistically significant. We find even less evidence of an effect on hours–perhaps not surprising, given ambiguous theoretical predictions and smaller estimated effects in previous research.

Endnotes

1. Council of Economic Advisers (2001).

2. Johnson (2000).

3. See Eissa and Hoynes (1998) for an analysis of the EITC and the labor supply of married couples.

4. Although some taxpayers can receive advanced EITC payments through their employers, only 1 percent of EITC recipients participated in this program in 1998 (Hotz and Scholz, 2001).

5. See Ross Phillips (2001) for a discussion of workers' knowledge of the EITC.

6. One puzzling aspect of Neumark and Wascher's results is that they sometimes find positive effects of state EITC credits on employment, but negative effects of the federal EITC on employment.

7. A second advantage of using cross-state variation in a differences-in-differences framework is that we avoid the serial correlation problem identified by Bertrand, *et al.* (2002). Most studies that examine policy changes for treatment and control groups have serial correlation in the error term, which can generate spurious significant estimated effects of ineffective policies.

8. A part of the Urban Institute project titled Assessing the New Federalism, the NSAF is representative of the noninstitutionalized, civilian population of persons under age 65 in the nation as a whole. The first two rounds of the survey were carried out in 1997 and 1999.

9. Some readers expressed concern that by focusing on low-income mothers, we select on an endogenous variable. Below we test the sensitivity of our results by using instead mothers with low education. (See the final panel of Table 3).

10. Meyer and Rosenbaum (2001: 1082) argue that a measure of current employment (in

their case, whether a woman worked in the last week) is more policy relevant, since it gives a measure of the proportion of all women working at a given time.

11. We also compared the labor force participation rates and hours worked of mothers with two and three children in Wisconsin with those in all other states (with and without EITC supplements). Neither the difference in differences for participation or for hours worked were significant.

12. There is substantial variation in benefit levels across states, and in the absolute and proportional increase in benefits for larger families. Prior to TANF implementation, median AFDC benefits were $80 (and 21 percent) higher for families with three children than for those with two. Wisconsin AFDC benefits were $517 for a family of three and $617 for a family of four– a difference of $100 (and 19 percent). In 2000, eight states had maximum monthly TANF benefits for families with three children that were at least $100 higher than maximum benefits for those with two children. At the same time, fifteen states had benefits for two and three child families that varied by $50 or less. While many states with higher overall benefit levels also had greater increases for larger families, the pattern was inconsistent: some states increased benefits for families with a third child by more than 25 percent, while others included adjustments of less than 10 percent. Wisconsin is an extreme case in this regard. Under Wisconsin's TANF program, benefits do not vary with family size: most women qualify for a maximum cash payment of about $650, regardless of the number of children.

13. The authors thank Marcia Meyers for providing these state-level measures of child care expenditures. For a detailed analysis of child care policy and single mothers' employment, see Bainbridge, Meyers, and Waldfogel (2002) .

14. Women with two children in Wisconsin receive a total EITC benefit of 0.456 percent (federal credit of 0.4 plus Wisconsin's 14 percent supplement). Women with three children receive 0.572 percent (the federal credit plus Wisconsin's 43 percent supplement). The ratio 1.572/1.456 equals 1.08.

15. Hotz and Scholz (2001) report elasticities with respect to net incomes, which relies on an assumption about the typical work hours of a labor market entrant. We report elasticities with respect to net wages, which is equivalent so long as hours worked are fixed and entrants have not reached the EITC cap. Our calculation is 1.5/(1.572/1.456-1)=0.19. For Eissa and Liebman the equivalent calculation is 1.9/(1.14/1.11-1).

16. In our analysis both measures are for the same sample and from the same data source. Meyer and Rosenbaum (2001) use a measure of work in the last week from the larger Outgoing Rotation Group File of the CPS, and a measure of annual employment from the March CPS.

References

Bainbridge, J., Meyers, M. and Waldfogel J. 2002. "Child Care Policy Reform and the Employment of Single Mothers." Manuscript. Columbia University, New York.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2002. "How Much Should We Trust Differences-in-Differences Estimation?" NBER Working Paper #8841.

Cancian, Maria, Robert Haveman, Daniel Meyer, and Barbara Wolfe. Forthcoming. "Before and After TANF: The Economic Well-Being of Women Leaving Welfare." *Social Service Review.*

Council of Economic Advisers. 2001. *Economic Report of the President.* Washington, DC: GPO.

Eissa, Nada and Hilary Hoynes. "The Earned Income Tax Credit and the Labor Supply of Married Couples" NBER Working Paper No. 6856, 1998.

Eissa, Nada and Jeffrey B. Liebman. 1996. "Labor Supply Response to the Earned Income Tax Credit." *Quarterly Journal of Economics* (May): 605–637.

Hotz, V. Joseph and John Karl Scholz. 2001. "The Earned Income Tax Credit." Cambridge, MA: NBER Working Paper no. 8078, January.

Hotz, V. Joseph, Charles H. Mullen and John Karl Scholz. 2002. "The Earned Income Tax Credit and Labor Market Participation of Families on Welfare," working paper.

Johnson, Nicholas. 2000. *A Hand Up: How State Earned Income Tax Credits Help Working Families Escape Poverty*. Washington, DC: The Center on Budget and Policy Priorities.

Meyer, Bruce D. and Dan T. Rosenbaum.2000. "Making Single Mothers Work: Recent Tax and Welfare Policy and Its Effects." *National Tax Journal* 53(4): 1027–1061.

Meyer, Bruce D. and Dan T. Rosenbaum. 2001. "Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers." *Quarterly Journal of Economics* (August) 1063–1114.

Neumark, David and William Wascher. 2000. "Using the EITC to Help Poor Families: New Evidence and a Comparison with the Minimum Wage." Cambridge, MA: NBER Working Paper no. 7599.

Ross Phillips, Katherin. 2001. "Who Knows About the Earned Income Tax Credit?" Urban Institute policy brief, No. B-27, January.

Scholz, John Karl. "The Earned Income Tax Credit: Participation, Compliance, and Antipoverty Effectiveness." *National Tax Journal* 47(1): 63–87, 1994.

Figure 1. Theoretical Labor Market Effects of the EITC.

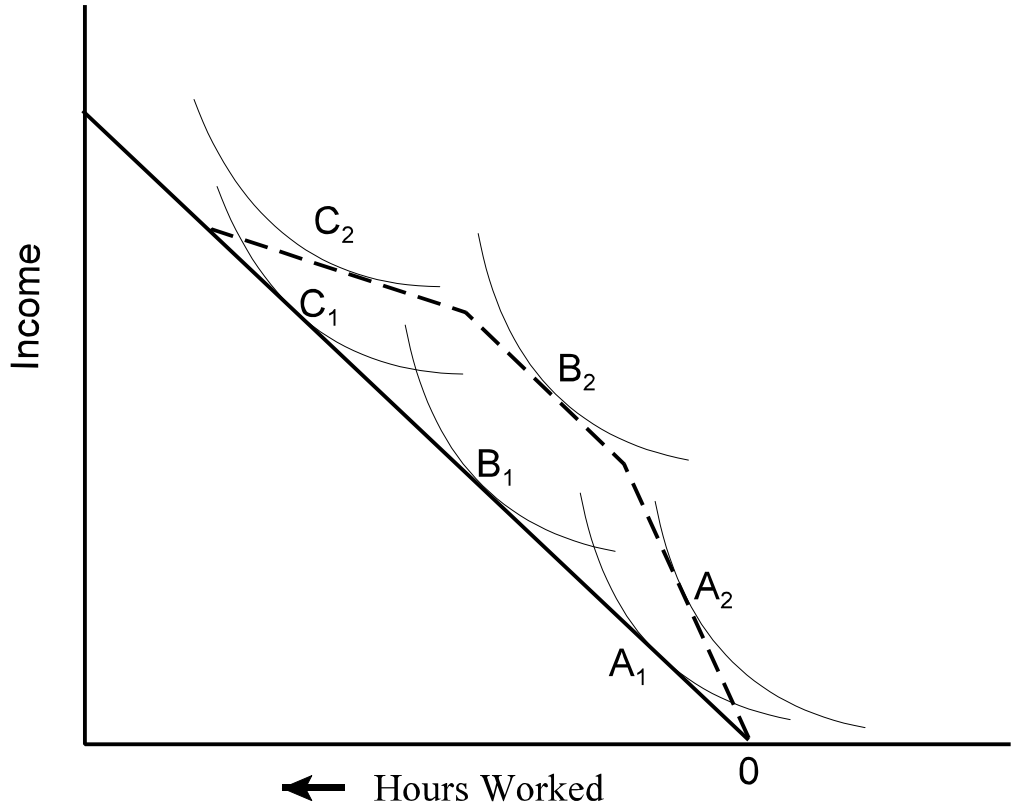

Figure 2. Actual EITC Comparisons

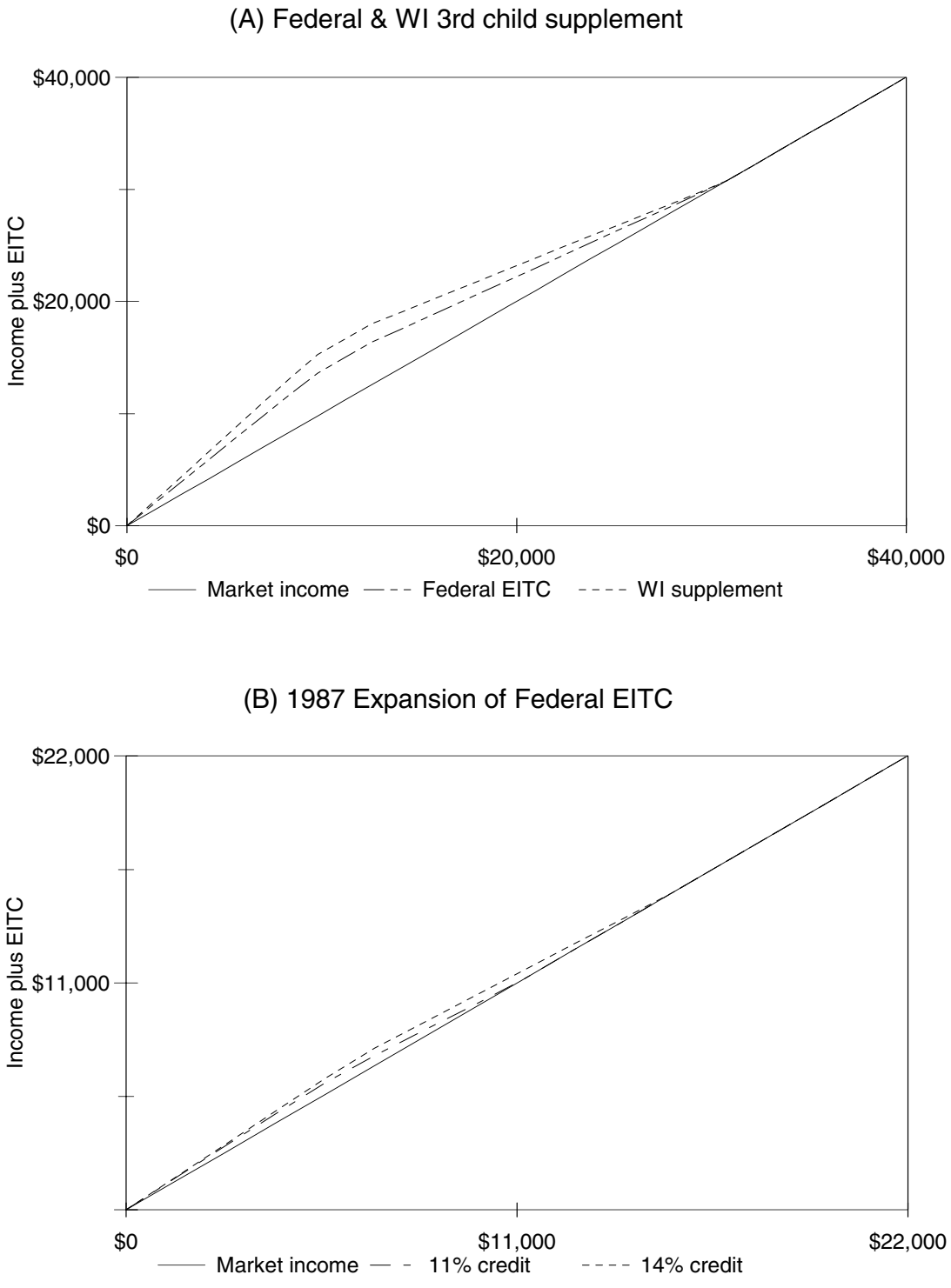

Table 1A. Employment Participation of Single Mothers 19-44 Years Old

	Currently Employed			Worked Last Year		
	Two Children (1)	Three Children (2)	Difference (2) - (1)	Two Children (1)	Three Children (2)	Difference (2)-(1)
(1) Wisconsin	0.841	0.833	-0.008	0.903	0.875	-0.028
	(0.018)	(0.023)	(0.029)	(0.014)	(0.020)	(0.023)
	n = 434	n = 257		n = 473	n = 281	
(2) States without EITC supplements	0.775	0.686	-0.089*	0.808	0.747	-0.061*
	(0.011)	(0.017)	(0.019)	(0.009)	(0.015)	(0.017)
	n = 1,522	n = 749		n = 1,763	n = 877	
Difference (1) - (2)	0.066*	0.147*	0.081*	0.095*	0.128*	0.033
	(0.022)	(0.032)	(0.035)	(0.020)	(0.028)	(0.029)

*Difference of means is statistically significant at 5 percent.
† Difference of means is statistically significant at 10 percent
Source: National Survey of American Families, 1997, 1999, pooled.
Notes:
- Includes only women earning less than 300 percent of the federal poverty line.
- "Other states" are those without EITC supplements: AL, AR, AZ, CA, CT, DE, FL, GA, HI, ID, IN, KY, LA, ME, MO, MS, MT, NC, ND, NE, NH, NM, NV, OH, OK, PA, SC, SD, TN, TX, UT, VA, WA, WI, and WV.

Table 1B. Weekly Hours Worked by Single Mothers 19-44 Years Old

	Two Children (1)	Three Children (2)	Difference (2)-(1)
(1) Wisconsin	39.06	39.49	0.44
	(11.39)	(11.36)	(0.96)
	n = 382	n = 220	
(2) States without EITC supplements	38.27	37.82	-0.45
	(10.66)	(12.06)	(0.57)
	n = 1,227	n = 552	
Difference (1) - (2)	0.79	1.67†	0.89
	(0.63)	(0.95)	(1.12)

*Difference of means is statistically significant at 5 percent.
† Difference of means is statistically significant at 10 percent
Source: National Survey of American Families, 1997, 1999, pooled.
Notes: - "Other states" are those without EITC supplements: AL, AR, AZ, CA, CT, DE, FL, GA, HI, ID, IN, KY, LA, ME, MO, MS, MT, NC, ND, NE, NH, NM, NV, OH, OK, PA, SC, SD, TN, TX, UT, VA, WA, WI, and WV.

Table 2. Labor Supply and Participation Effects of the EITC
(Single mothers, 19-44 years old with 2 or 3 children and income less than 300% of federal poverty line)

		Currently Employed		Worked Last Year		
	Means	Probit Coefficients	Marginal Effects	Probit Coefficients	Marginal Effects	Weekly Hours Worked OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Wisconsin dummy	0.222	0.239†	0.058	0.391*	0.087	0.619
		(0.139)		(0.141)		(1.092)
3 children dummy	0.341	-0.230*	-0.061	-0.133*	-0.034	-0.180
		(0.069)		(0.062)		(0.597)
Wisconsin x 3 kids Dummy	0.083	0.227	0.054	0.063	0.015	0.669
		(0.146)		(0.143)		(1.116)
Preschool age	0.390	-0.173	-0.046	-0.310*	-0.079	-1.347*
		(0.066)		(0.063)		(0.587)
Age of mother	32.0	0.098*	0.025	0.079*	0.019	-0.188
	(6.4)	(0.042)		(0.038)		(0.352)
Age of mother squared	1089.42	-0.001†	-0.0003	-0.001*	-0.0003	0.004
	(406.43)	(0.0007)		(0.0006)		(0.005)
Completed high school	0.659	0.479*	0.134	0.570*	0.153	2.013*
		(0.070)		(0.064)		(0.670)
Has associate or higher Degree	0.152	0.623*	0.130	0.624*	0.123	3.703*
		(0.102)		(0.093)		(0.812)
Has health problem that disrupt work	0.145	-0.799*	-0.258	-0.747*	-0.229	-3.501*
		(0.076)		(0.067)		(0.861)

(continued)

(Table 2, continued)

		Currently Employed		Worked Last Year		
	Means	Probit Coefficients	Marginal Effects	Probit Coefficients	Marginal Effects	Weekly Hours Worked OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Hispanic origin	0.143	-0.139	-0.038	-0.032	-0.008	-0.421
		(0.092)		(0.088)		(0.784)
White	0.601	0.013	0.003	0.023	0.006	-0.237
		(0.065)		(0.061)		(0.519)
Other race	0.027	-0.0006	-0.0002	-0.113	-0.029	-0.888
		(0.181)		(0.159)		(1.371)
Immigrant	0.059	0.239	0.056	0.263*	0.057	0.178
		(0.151)		(0.131)		(1.235)
State unemployment level	4.587	-0.094	-0.024	-0.114†	-0.028	-0.874†
	(0.901)	(0.075)		(0.066)		(0.530)
State maximum AFDC benefit	0.389	-0.328	-0.085	-0.629*	-0.156	-0.086
(000 dollars)	(0.191)	(0.300)		(0.263)		(2.336)
Federal child care spending	0.770	-0.048	-0.012	0.069	0.017	-2.014
per poor child (000 dollars)	(0.374)	(0.170)		(0.141)		(1.359)
Head start and pre-K spending	0.258	0.551	0.143	0.553	0.137	-1.424
Per young child (000 dollars)	(0.089)	(0.449)		(0.423)		(3.442)
Year = 1999 dummy	0.439	1.141*	0.254	0.192*	0.047	0.165
		(0.095)		(0.074)		(0.602)
Constant		-1.065	-	0.009		45.092*
		(0.784)		(0.713)		(6.314)
N	3,394	2,962		3,394		2,381
R^2	-	0. 202	-	0.113	-	0.028

Standard errors in parenthesis (robust standard error for (2) through (4)).
* Significant under 5% level. † Significant under 10% level.

Table 3. Alternative Samples

	Estimated Coefficients on Wisconsin x 3 Children Interaction		
	Currently Employed Probit (1)	Worked Last Year Probit (2)	Weekly hours worked OLS Regression (3)
Sample: single mother, 19-44 years old, with 2 or 3 children whose income:			
From Table 2. (Less than 300 % of federal poverty line).	0.227 (0.146) [0.054] n = 2,962	0.063 (0.143) [0.015] n = 3,394	0.669 (1.116) n = 2,381
Less than 200 % of federal poverty line.	0.213 (0.154) [0.056] n = 2,547	0.037 (0.148) [0.001] n = 2,945	0.372 (1.255) n = 1,983
Less than 100 % percent of federal poverty line.	0.486* (0.203) [0.156] n = 1,382	0.081 (0.183) [0.028 n = 1,692	-1.930 (2.071) n = 917
Sample: single mothers 19-44 years old, and:			
Income less than 300% of federal poverty line, with children	0.135 (0.113) [0.032] n = 5,471	-0.007 (0.107) [-0.017] n = 6,334	0.516 (0.880) n = 4,481
Income less than 300% of federal poverty line, with 2 or 3 children, including other states with EITC supplement	0.142 (0.139) [0.035] n = 4,836	0.037 (0.136) [0.009] n = 5,583	0.043 (1.036) n = 3,874
Sample: single mother 19-44 years old, with 2 or 3 children and:			
With high school education or lower	0.014 (0.187) [0.004] n = 1,748	-0.066 (0.186) [-0.018] n = 2,034	-1.152 (1.149) n = 1,334

† Significant at 10% level ,** significant at 5% level. Robust standard errors in parentheses. Marginal effects for probit model in square brackets.

Appendix Table A1. Sample Construction

Sample Criterion	NSAF 1997	NSAF 1999	Total 1997-99
Total sample observations of:			
Single family with children whose income is less than 300% of federal poverty line	7,086	6,209	13,295
Focusing on:			
Family of single woman	6,461	5,623	12,084
Age of household head between 19 - 44 years old	5,686	4,897	10,583
Lives in Wisconsin or other state without EITC	3,420	2,920	6,340
Has 2 or 3 children	1,901	1,493	3,394
Report non-missing values of current employment participation	1,901	1,061	2,962
Report non-missing values of last year employment participation	1,901	1,493	3,394
Report non-missing values of hours worked	1,283	1,098	2,381

Appendix Table A2. Demographic characteristics of household head

(Sample: female household head, 19 to 44 years old, income <= 300% of poverty threshold)

	With no children in all states (1)	With 2 children in Wisconsin (2)	With 3 children in Wisconsin (3)	With 2 children in states with no EITC supplement (4)	With 3 children in states with no EITC supplement (5)
Age	28.76	32.89*	32.91*	32.47*	31.78*
	(7.75)	(6.48)	(5.91)	(6.52)	(6.03)
High school degree	0.61	0.66*	0.66	0.67*	0.65*
	(0.49)	(0.48)	(0.48)	(0.47)	(0.48)
Higher education degree	0.22	0.18*	0.18	0.16*	0.12*
	(0.41)	(0.38)	(0.38)	(0.37)	(0.32)
Unhealthy	0.15	0.13	0.15	0.15	0.14*
	(0.36)	(0.33)	(0.36)	(0.36)	(0.35)
Hispanic origin	0.14	0.09*	0.09*	0.15	0.17*
	(0.35)	(0.28)	(0.28)	(0.36)	(0.37)
Black	0.16	0.32*	0.41*	0.36*	0.41*
	(0.37)	(0.47)	(0.49)	(0.48)	(0.49)
White	0.79	0.66*	0.56*	0.61*	0.56*
	(0.41)	(0.47)	(0.50)	(0.49)	(0.50)
Other	0.05	0.02*	0.03	0.03*	0.03*
	(0.22)	(0.13)	(0.18)	(0.17)	(0.17)
Immigrant	0.11	0.03*	0.02*	0.07*	0.07*
	(0.31)	(0.16)	(0.16)	(0.25)	(0.26)
Family earnings last year ($) [a]	11,667	15,909*	16,207*	14,907*	14,242*
	(8,040)	(10,146)	(11,708)	(10,440)	(11,421)
Observations	2,319	473	281	1,763	877

*Statistically significantly different from column (1) at 5 percent.

Note: [a] Conditional on last year being employed.