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Relationship Between the EITC and Food Stamp Program Participation Among Households With Children

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Abstract

The Federal Earned Income Tax Credit (EITC) and the Food Stamp Program (FSP) are the largest means-tested transfer programs for low-income, working parents in the United States. This study examines how these two programs interact, particularly with regard to the impact of the EITC on participation in the FSP during the latter half of the 1990s. Although EITC payments do not reduce the potential size of a household's food stamp allotment under FSP rules, they do add to a household's resources and thus could affect a household's willingness to participate in the FSP. The paper tests this hypothesis with monthly data from the Survey of Income and Program Participation for 1996 through 1999. Although the findings are mixed, they provide evidence of negative impact of EITC on FSP participation.

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I. Introduction

The federal Earned Income Tax Credit (EITC) and the Food Stamp Program (FSP) are the largest means-tested transfer programs for low-income working parents in the United States. Together, the two programs spend nearly $50 billion per year and comprise the bulk of the social safety net for working poor families. They are central to the strategy for moving welfare recipients to work. The combination of food stamps, EITC, and other supports allow even low-wage workers to raise their families' incomes above the poverty line. But supplements can only achieve a significant anti-poverty impact if people use them. Since 1994, when welfare rolls plummeted and the supplementary contribution of food stamps should have been playing an expanded role, the proportion of eligible families receiving food stamps declined sharply.

The recent reduction in FSP participation rates is not entirely a surprise. The working poor have historically had lower participation rates than the non-working poor, especially those on welfare. One reason is that FSP eligibility comes automatically with welfare receipt but is not automatic for eligible households headed by low-wage workers not on welfare. As the low-income population moved off the welfare rolls and into low-wage jobs, the share of eligible households in the groups least likely to use food stamps increased while FSP eligibles on welfare decreased. From this perspective, the shift in the composition of eligibles explains some of the decline in FSP participation rates. But, from another perspective, why should former welfare recipients have lowered their participation rates? After all, former welfare recipients have received and used food stamps in the past and should be familiar with the workings of the program and with the ability to use the benefits to pay part of their food budget. Yet, in the latter half of the 1990s, only 42-43 percent of former welfare recipients still eligible for food stamps actually participated in the FSP (Zedlewski and Brauner 1999; Zedlewski with Gruber 2001). It is possible that, as Zedlewski and Brauner (1999) point out, low participation rates by former welfare recipients may be, in part, due to misinformation about continued eligibility for food stamps.

Certainly, the expanding economy in the 1990s played a role as discussed in greater detail in Section II. For example, according to a recent study by Ziliak, Gundersen, and Figlio (2001), declining unemployment rates and rising employment accounted for up to 45 percent of the 1994-1998 decline in food stamp participation while changing welfare programs contributed another five to eight percent.

Between 1990 and 1999, federal EITC spending jumped from $9.6 billion to $31.1 billion in 1999 dollars (see textbox below).[1] The maximum credit under EITC more than tripled between 1990 and 1999 from $1,215 to $3,816 in 1999 dollars.[2] In addition, 16 states have adopted state earned income credits, largely patterned after the federal EITC. Meanwhile, according to Rosso (2001), FSP participation rates declined between 1994 and 1999 from 74 to 57 percent of eligibles (see Figure 1). While the decline in FSP participation rates and the expansion in EITC benefits appear to be related, regression analyses controlling for intervening factors may be able to determine whether this negative correlation is real or spurious.

It is in this context that we hypothesize that the EITC may have an effect on FSP participation rates. Since EITC payments are not counted as income in determining food stamp eligibility, any connection between the EITC and FSP participation must be through the effect of the EITC on the desire of eligible families to participate in the program. Two competing hypotheses may explain the relationship between the EITC and FSP participation. (1) It may be that people who benefit from EITC learn about and understand how government programs can help provide for their families. If this is the case, we would expect that claiming the EITC would be positively correlated with receiving food stamps. (2) On the other hand, expanded EITC benefits may reduce the need for food stamp benefits, causing families not to go through the trouble of obtaining food stamps or suffer any stigma associated with food stamp receipt and use. If this is the case, we would expect a negative correlation between the EITC and FSP receipt.

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[1] Committee on Ways and Means, U.S. House of Representatives. 2000a. "Tax Provisions Related to Retirement, Health, Poverty, Employment, Disability and Other Social Issues." In *2000 Green Book*, 808-13. Washington, DC: U.S. Government Printing Office. http://aspe.hhs.gov/2000gb/index.htm, (Accesses August 2003).

The Earned Income Tax Credit: What Is It and How Does It Work?

The Earned Income Tax Credit (EITC) is a refundable federal income tax credit for low-income working individuals and families. The federal EITC was implemented to provide incentives to work and to offset social security taxes. The EITC, the nation's largest income supplement program, was expanded from $9.6 billion in 1990 to $31.1 billion in 1999 (in 1999 dollars).[3] The $31.1 billion spent in 1999 provided assistance for 19.4 million working families.[4]

Household earnings and household size determine the amount of EITC received. In 2002, income had to be less than $29,201 for a single individual with one child. The table below provides information about the maximum benefit allowed by the federal EITC as well as the federal government's total spending on the program per year.

Characteristics of the Federal EITC (1999 Dollars)[5]

	Maximum Credit					
	1995	**1996**	**1997**	**1998**	**1999**	**2000**
No children	$343	$343	$345	$354	$360	$366
1 Child	$2,289	$2,285	$2,294	$2,357	$2,400	$2,442
2+ Children	$3,400	$3,776	$3,795	$3,899	$3,961	$4,036
Annual Spending (Millions)	$28,375	$30,607	$31,544	$33,569	$31,104	$31,142

In 2000 and 2001, ten states implemented or expanded state Earned Income Credit (EIC)[6] programs bringing the total number of states offering EICs based upon the federal EITC to 16.[7] Out of the 16 states offering EICs, 15 of these states' EICs piggyback on the EITC. The states that piggyback on the EITC use federal rules to determine who is eligible for the EIC, and express EIC amounts as a percentage of EITC. The table below provides a listing of states with EIC programs and whether they are refundable or non-refundable programs.

State EIC programs can be either refundable (like the federal EITC) or non-refundable. This is an important distinction since refundable benefits allow taxpayers to receive the full amount of the tax

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[2] Ibid, 2000a.

[3] Ibid, 2000a.

[4] Ibid, 2000a.

[5] Ibid., 2000a; Committee on Ways and Means, U.S. House of Representatives. 2000b. "Description of the Marriage Penalty Relief Act of 2000." http://www.house.gov/jct/x-3-00.pdf, (Accessed August 2003), February 2.

[6] For simplicity, in this paper we use the acronym EIC when referring to state-level Earned Income Credit programs and EITC when referring to the federal Earned Income Tax Credit program.

[7] Minnesota and Indiana have or have had EICs that are not expressed as a percentage of the federal EITC or follow different eligibility guidelines; however, Indiana adopted the practice of expressing their EIC in terms of the federal EITC in January 2003.

credit even if the amount of the credit exceeds the individual's tax liability. For example, if an individual has a tax liability of $500 and is eligible for a credit of $550, then the credit covers the $500 tax liability and this individual will receive $50 under a refundable benefits system. On the other hand, if the credit is non-refundable, an individual receives benefits less than or equal to their tax liability. In the above example, the individual will have their $500 tax liability covered but will not receive the $50 that is not needed to cover the taxes.

There are also nine states without an income tax. In terms of financial assistance to the working poor, states without income taxes are less generous than the states with refundable EIC programs and more generous than the states with non-refundable EIC programs.

State-level Earned Income Credit (EIC) Programs[8]

State	Type	Year Enacted
Colorado	Refundable	1999
District of Columbia	Refundable	2000
Illinois	Refundable	2000
Indiana	Refundable	1999
Iowa	Non-refundable	1998
Kansas	Refundable	1998
Maine	Non-refundable	2000
Maryland	Refundable	1998
Maryland	Non-refundable (optional)	1987
Montgomery County, MD	Refundable	1999
Massachusetts	Refundable	1997
Minnesota	Refundable	1991
New Jersey	Refundable	2000
New York	Refundable	1994
Oklahoma	Refundable	2002
Oregon	Non-refundable	1997
Rhode Island	Non-refundable	1986
Vermont	Refundable	1988
Wisconsin	Refundable	1989

Research Questions

This study examines how EITC benefits interact with the receipt of food stamp benefits, building on prior research examining the determinants of changes in the food stamp caseload, such as the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 and the

[8] Johnson, Nicholas. 2001. *A Hand Up: How State Earned Income Tax Credits Help Working Families Escape Poverty in 2001.* Washington, DC: Center on Budget and Policy Priorities.

expanding economy in the 1990s. We estimate EITC's impact on FSP participation during the post-welfare reform era—the years 1996 to 1999. Our study focuses on two research questions:

1. What are the patterns of EITC receipt, food stamp receipt, and joint EITC-food stamp receipt among various subgroups? How do these trends vary over time?

2. Does the EITC, holding constant food stamp eligibility, change participation in the Food Stamp Program?

To answer these questions, we analyze data from the 1996 panel of Survey of Income and Program Participation (SIPP), which follows individuals from 1996 through early 2000. For the first research question, we employ descriptive analyses of the SIPP data. In answering the second research question, we rely on three econometric models (described below), each using a different methodological strategy.

Organization of the Paper

Section II describes the relevant literature on food stamp caseload decline and EITC participation in the 1990s and the current research estimating the magnitude of the effect of welfare reform and the macroeconomy on food stamp caseload declines. Section III discusses our study population and presents our econometric models. Data and methods are described in Section IV followed by a discussion of our findings in Section V and conclusions in Section VI.

II. Relevant Literature

The EITC has grown steadily in terms of real spending since its inception in 1975, with much of this growth occurring in the 1990s. EITC expansions, each with three-year phase in periods, began in 1990 and 1993, increasing overall spending every year from 1990 to 1996. The expansions raised the maximum credit a household is eligible for, the credit rate, and the threshold at which the credit was phased out, thereby increasing eligibility (Hotz and Scholz 2000). Figure 1 illustrates the change in the average EITC credit per household between 1994 and 1999. A credit for childless workers, introduced in 1994, further increased the number of eligible families.

Despite the size and growth of the EITC, only a few attempts have been made to estimate the number of eligible households receiving the credit. Hotz and Scholz (2000) attribute this to the lack of available data including the number of eligible taxpayers, the number of people filing tax returns, and the number receiving the EITC.

Still, a few studies are available that suggest EITC participation rates in the range of 75 to 88 percent. A U.S. General Accounting Office (GAO) 2001 study using the Current Population Survey (CPS) for 1999 and Internal Revenue Service estimates of the number of eligible taxpayers who claimed the EITC in 1999 to determined that 75.0 percent of all eligible households participated in the EITC in 1999. The GAO (2001) also finds that the EITC participation rate ranged from a high of 96.0 percent of households with one qualifying child to a low of 44.7 percent of households without children. Households with two and three or more qualifying children had participation rates of 93.0 percent and 62.5 percent, respectively, in 1999.

A study by Liebman (1996) matched March 1991 CPS records with 1990 individual tax returns and finds that the lowest participation rates (70 percent) were in the phase-in range. Finally, a recent IRS (2002) study conducted based on the March 1997 CPS matched to tax records estimated the percentage of EITC-eligible tax units that did not file a tax return and thus did not claim EITC. According to this study, at least 13 percent of EITC eligible units were non-filers but the rate could be 20 percent or higher; of those providing valid social security numbers that allowed a match with tax records, 17 percent did not file a return.

Beginning in 1994, during the latter part of the expansion in the EITC, FSP participation rates began falling. Between 1994 and 1999 the individual participation rate fell 17 percentage points from 74 percent of eligible individuals participating to only 57 percent. The largest drop in a single year, five percentage points, occurred between 1996 and 1997, when PRWORA took effect, and rates continued to drop through 1999 (Rosso 2001).

Only one study briefly discusses the EITC-FSP interaction. Currie and Grogger (2001) estimate that among single headed households with more than one child the expansion in the generosity of the EITC (as measured by the phase-in subsidy rate) explains about one-fourth of the decline in their FSP participation.

However, an extensive literature on the determinants of declining participation in the FSP during the 1990s does exist. This literature includes both descriptive studies (Lerman and Wiseman 2002; Rosso 2001; Schirm 2001; Zedlewski with Gruber 2001; Dion and Pavetti 2000; Daponte et al. 1999; USDA 1999; U.S. GAO 1999; Zedlewski and Brauner 1999) and studies using multivariate econometric methods (Kornfeld 2002; Currie and Grogger 2001; Gleason et al. 2001; Tschoepe and Hindera 2001; Ziliak et al. 2001; Wilde et al. 2000; Wallace and Blank 1999; Gleason et al. 1998). The literature discusses two major determinants of declines in the food stamp caseloads: welfare reform under PRWORA and the expanding economy.

PRWORA Legislation and Declining Food Stamp Caseloads

Several legislative changes during the second half of the 1990s may have contributed to the decline in participation rates. PRWORA legislation reduced food stamp benefit levels by including some income sources that were previously excluded from eligibility determinations, freezing the standard deduction, capping the excess shelter deduction, and reducing the maximum benefit level (Zedlewski and Brauner 1999).

Other legislation not specifically aimed at the FSP may have also affected participation. The transition from Aid to Families with Dependent Children (AFDC) to Temporary Assistance to Needy Families (TANF) under PRWORA may have affected FSP participation rates both by increasing restrictions for the receipt of cash benefits and giving states greater flexibility in administering programs. Greater restrictions under TANF increase the possibility of sanctions, and PRWORA prohibits food stamp benefits from rising, as they would before TANF, to make up for lost income. With greater flexibility in administering programs, states now have the option of sanctioning food stamp benefits for households with TANF sanctions. States also may use stricter TANF rules in place of or in combination with FSP rules to determine program eligibility (Zedlewski and Brauner 1999), preventing some households who appear to be eligible for FSP from taking advantage of it. Because eligible households often apply for TANF and food stamps together, measures intended to discourage TANF enrollment such as work restrictions and offering lump-sum "diversion payments" could discourage FSP participation. In addition to these legal methods, the U.S. General Accounting Office (1999) finds that some states used the increased flexibility to implement more stringent TANF-related rules, such as sanctioning an entire household's food stamp benefits when one member's TANF benefits are sanctioned, creating barriers to food stamp receipt.

The effects of welfare reform on FSP participation remain unclear. Households that receive public assistance benefits have historically had high FSP participation rates. These high rates continued throughout the 1990s, rising 13 points between 1996 and 1999 for families on AFDC/TANF (Rosso 2001). On the other hand, households who left AFDC/TANF after the passage of PRWORA and remained eligible for FSP did not continue to have the same levels of participation. Using data from the 1997 National Survey of America's Families (NSAF), Zedlewski and Brauner (1999) estimate that 62 percent of households leaving AFDC/TANF left the FSP as well. Increased earnings account for some, but not all of this drop in participation. About 50 percent of welfare leavers remained below the poverty line and were likely still eligible for FSP benefits. Surprisingly even welfare leavers at the bottom of the income range left the FSP at high rates, especially compared to households with similar earnings who had never been on welfare. In households with incomes below 50 percent of poverty, 45 percent of former

welfare households left FSP, while only 23 percent of households who had never been on welfare left the program (Zedlewski and Brauner 1999). Low participation rates for welfare leavers continued through 1999 (Zedlewski with Gruber 2001).

Subgroups with High Rates of Food Stamp Caseload Decline

Participation rates for several other groups also dropped during this period, including some with historically high FSP participation. Households below 50 percent of poverty traditionally participate at high rates because they are eligible for large benefits. From 1996 to 1999, however, FSP participation rates dropped 20 percentage points for this group. Children, traditionally the largest group of participants in the FSP, experienced an 18 percentage point drop in participation rates during the same period. Single parent households' participation rate fell 15 percentage points. The largest decrease occurred from 1996-1997, probably reflecting the tendency of single parent households to be more affected by changes in welfare than other types of households. Participation rates for married couple households with children dropped 17 percentage points, possibly because these households are more likely to have earnings than other families (Rosso 2001).

Households with earnings have historically low participation rates, and these rates dropped further in the second half of the 1990s. Transaction costs for this group of households are generally higher than for households without earnings. They have to be re-certified more frequently than other households because their incomes fluctuate more than non-earners' (Currie and Grogger 2001). PRWORA restrictions and the strong economy of the 1990s likely affected incentives for eligible working households to participate in the FSP. Their benefit levels are generally lower than households without earnings, making working households' participation very sensitive to increases in earnings and decreases in deductions that can further reduce benefit levels (Zedlewski with Gruber 2001).

Estimating the Magnitude of the Effect of PRWORA on Declining Food Stamp Caseloads

Econometric studies estimate that anywhere from a negligible amount to 30 percent of the decline in food stamp participation rates can be explained by the advent of welfare reform (Kornfeld 2002; Currie and Grogger 2001; Gleason et al. 2001; Tschoepe and Hindera 2001; Ziliak et al. 2001; Wilde et al. 2000; USDA 1999; Wallace and Blank 1999; Gleason et al. 1998). On the low end, Wilde et al. (2000) find waivers/TANF explain only a negligible portion of the

food stamp caseload decline.[9] Also on the low end, Wallace and Blank (1999) estimate that the equivalent of implementing a welfare waiver program in every state accounts for six percent of the decline in food stamp caseloads between 1994 and 1998.[10]

Currie and Grogger (2001) describe how changes in eligibility, sanction, and work requirement policies under welfare reform may directly affect food stamp caseloads. Using administrative data and the Current Population Survey (CPS), Currie and Grogger (2001) estimate that welfare reform accounts for 30 percent of the decrease in FSP participation between 1993 and 1998. Using FSP quality control data, Gleason et al. (2001) estimate that, while work requirements explain two percent of food stamp caseload decline, PRWORA more generally accounts for 23 percent of the decline in food stamp caseloads.

USDA (1999) examines food stamp caseload declines in a descriptive study using quality control data for 1994 to 1998. USDA (1999) finds that eligibility changes under PRWORA resulted in significant declines in the food stamp caseload for two groups: legal permanent residents—accounting for 14 percent in the total food stamp caseload decline—and childless unemployed adults—accounting for eight percent of the total food stamp caseload decline. Not surprisingly, given that they are a large proportion of the caseload, TANF participants accounted for 61 percent of the decline in caseload, and all other participants accounted for 17 percent of the decline.

Estimating the Magnitude of the Effect of the Macroeconomy on Declining Food Stamp Caseloads

Econometric estimates find that about 20 to 44 percent of the decline in food stamp caseloads can be explained by the expanding economy (Currie and Grogger 2001, Gleason et al. 2001; Wilde et al. 2000, Wallace and Blank 1999; Gleason et al. 1998). On the low end, Currie and Grogger (2001) use administrative data and the CPS and find that changes in unemployment account for 20 percent of the decrease in FSP participation between 1993 and 1998. Gleason et al. (2001) use FSP quality control data and find that economic factors account for 40 percent of the food stamp caseload decline—double that of Currie and Grogger (2001). In a state-level

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[9] The welfare reform indicator is "the fraction of a year that any statewide AFDC waiver or post-1996 welfare reform is in effect" and the log of real maximum AFDC/TANF plus food stamp benefits for a family of three.

[10] It is likely that these lower estimates can be partially explained by measuring the effect of waivers as opposed to PRWORA. Studies finding higher impacts measure the effect of PRWORA or state welfare rules on FSP participation.

econometric analysis, Wilde et al. (2000) find that the expanding economy accounts for 35 percent of the total decline in food stamp caseloads between 1994 and 1998.

Using both annual and monthly data, Wallace and Blank (1999) estimate that declining unemployment rates explain 28 to 44 percent of food stamp caseload declines since 1994. They estimate that a one-percentage point increase in unemployment results in a six to seven percentage point increase in food stamp caseloads. Wallace and Blank (1999) also find that food stamps received by households not eligible for welfare are more cyclical than overall food stamps. In addition, food stamp caseload changes for non-welfare households are better explained by economic and demographic variables. Finally, Wallace and Blank (1999) find the political party of the state's governor is a significant predictor of food stamp caseloads despite the fact that state legislation and regulation cannot directly affect food stamp eligibility and payments. It is possible, however, that the governor can affect food stamp administrative procedures.

This Study's Contribution

Prior researchers have not explicitly modeled and tested the relationship between the EITC and the Food Stamp Program. While past research has explained much of the decline in the food stamp caseloads, the impact of the EITC on food stamp participation has not been analyzed carefully, despite the possibility that EITC expansions may explain some of the decline in food stamp caseloads. Alternatively, if EITC and food stamps are positively related, the expansion in EITC may have prevented food stamp caseloads from declining even more precipitously. This study contributes to understanding program participation decisions of the working poor and to improving the efficiency and effectiveness of the FSP in the long-term in three key ways.

First, 58 percent of past FSP participants and 41 percent of current FSP participants report having "ever received" EITC (Ross Phillips 2001). Given the high percentage of families who use both programs, it is important to understand which families are receiving benefits from both programs and which families are not, and, if not, why not. Our first research question is explicitly designed to increase understanding about which households receive both the EITC and food stamps and which eligible households only receive income from one of these sources.

Second, while many families are eligible to receive both EITC and food stamps, many do not take advantage of the income support provided by both programs. Our second research question specifically addresses changes in Food Stamp Program participation, particularly whether families are adding EITC benefits to FSP benefits or substituting EITC benefits for FSP benefits as they leave the welfare rolls and rejoin the work force. By beginning to understand which

eligibles are not utilizing both programs, we can begin to look for ways to improve the efficiency and effectiveness of both the EITC and FSP.

Third, models 1 and 2 incorporate both measures of program implementation and macroeconomic measures as discussed in prior studies and add additional measures of *individual* program participation, benefits received, and employment status. In some cases, introducing individual characteristics into our models explains away the relationship between macro variables and food stamp participation.[11]

III. Study Population and Econometric Models

Supplementary benefits such as food stamps are a key component of the U.S. strategy for moving welfare recipients to work. As discussed above, however, in recent years the proportion of eligible families actually receiving food stamps has declined sharply. The studies discussed in Section II suggest that about half of this decline in food stamp participation can be explained by welfare reform and the expanding economy of the 1990s. Thus, about half of the decline remains unexplained.

The expansion of the EITC remains an unexplored factor that may have significantly affected food stamp participation during the 1990s. However, as we discuss in Section IV, our data are for the latter half of the 1990s after the vast majority of the EITC expansion occurred. One source of variation that we can exploit stems from the varying amounts of EITC a household may be eligible for due to changes in household size. As Figure 2 shows, EITC is offered at three levels—to households with no children, to households with one child, and to households with two or more children. On the other hand, food stamps are offered in increasing amounts as household size increases beyond three or four persons. Thus, going from one to two children increases both EITC and food stamp eligibility, while increases from two to three children raise only food stamp but not EITC eligibility. Consider one-parent families with earnings of $800 per month and from one to three children. Each additional child raises food stamp benefits by about $1,200 ($1,294 for the second and $1,152 for the third child). Since EITC amounts do not reduce food-stamp eligibility (or gross food stamp benefits), we might expect that the rise in food stamp participation in moving from one to two children should be as high as the rise in participation in moving from two to three children. However, because of EITC, household

[11] The statistical significance of the aggregate variables (e.g., state unemployment rate) should be interpreted cautiously because, as Moulton (1990) points out, there is some possibility that the estimates of the standard errors for these aggregate coefficients are biased downward.

income is higher for two-child families than for one-child families, but the addition of a third child does not raise household income. One mechanism by which EITC income can lower participation in FSP can be observed by comparing the change in FSP participation from one- to two-child families with the change from two- to three-child families. By exploiting this and other variations in both household size and income, we examine how EITC receipt affects FSP participation rates.

Another approach is to examine whether changes in EITC income induce the same or less of a decline in participation than changes in earned income. Again, since higher earnings lowers benefit amount but EITC does not, we might expect higher earnings to lower participation but higher EITC to not lower participation. This question is difficult to test because EITC generally changes with earnings. We can take advantage of the non-linear relationship between earnings and EITC. If EITC had no effect, we would expect higher earnings to lower participation by the same amount whether EITC increases, remains unchanged or decreases. On the other hand, if EITC exerts an independent, negative effect on participation, then increases in earnings that raise EITC amounts should lower participation more than increases in earnings that leave EITC unchanged or reduce EITC.

A final approach is to exploit the seasonal variation in EITC receipt. Over 98 percent of EITC claimants receive their EITC benefits in a lump sum,[12] usually during the first or early in the second trimester of the year. Given that the EITC may be over $4,000 for some low-income families with two or more children, it is plausible that any effect of the EITC on food stamp participation is greater in the months around when the lump sum is received. To determine if the timing of the receipt of EITC benefits impacts food stamp receipt, we measure whether federal EITC receipt has a seasonal effect on food stamp participation.

Study Population

We limit our study population to working-age parents living in low-income households who are likely to meet the income and asset eligibility criteria for the Food Stamp Program.[13] To do this,

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[12] Hotz, V. Joseph and John Karl Scholz. 2000. *The Earned Income Tax Credit*. Paper for the NBER Conference on Means-Tested Transfers, July, p. 54.

[13] Poverty thresholds are determined using *family* size, and the EITC is determined on the basis of the filing unit income and presence and number of children. The FSP provides benefits based on *household* size, and our unit of analysis in the SIPP data is *household* heads. However, in determining eligible EITC benefits, we used information on expected filing units (information on individuals, on spouses, where appropriate, and on the resident children living with individuals and any spouses. In this paper, though we sometimes use individuals and married couples, we use the term household in describing our results.

our study population is limited to low-income household heads ages 18 to 60 with children present in the household. For this analysis, a household is defined as low income if the household is below 130 percent of the poverty line and if household assets are less than or equal to $2,000, or $3,000 if at least one household member is age 60 or older.[14] By using both income and assets to limit the population, we more closely approximate low-income households that may be eligible for food stamps than by using income by itself.[15] Our study population includes household heads observed living in a low-income household with children *in any month* so that the population does not change over the 1996 SIPP panel.

Econometric Models

Our empirical analysis examines how federal EITC benefits affect FSP participation between 1996 and 1999. We build on prior research by estimating the following three models while controlling for factors that have already been examined in prior research such as the impact of the macroeconomy, implementation of TANF, etc. (Currie and Grogger 2001; Ziliak, Gundersen, and Figlio 2001; Figlio, Gunderson, and Ziliak 2000).

Each of the three models examines a different aspect of the EITC—actual EITC benefits claimed (model 1), EITC benefits a household is eligible for (model 2), and a natural experiment exploiting the variation in the flat portion of the EITC benefits schedule between households of the same size with either one or two children (model 3).

Model 1: The Relationship Between Actual Federal EITC Benefits Claimed and Food Stamp Program Participation Considering State EIC Implementation

We use a logit model to examine the relationship between actual federal EITC claimed and FSP participation. Our dependent variable is Food Stamp Program participation which equals one if a household head participates in the FSP during a given month and zero otherwise. Our primary independent variable of interest is actual federal EITC claimed by the household head.

We also consider the impact of refundable state EIC programs using a state-level variable measuring whether and in what year a refundable EIC program was implemented for each state. While previous research (see Currie and Grogger 2001) indicates that variation between state

[14] Assets include checking, savings, and bonds as measured in the topical modules of the 1996 SIPP panel for waves 3, 6, 9, and 12. Asset information for each available wave is repeated for prior waves.

[15] Using asset levels to determine FSP eligibility since prior research using the SIPP (see Daponte, Sanders, and Taylor 1999; Blank and Ruggles 1996) indicates that adding the asset test raises the estimated FSP take-up rates and that take-up rates calculated without asset measures may be inaccurate.

EIC rules and federal EITC changes over time may not be dramatic, we do include a variable to capture state-level variation. Recall that a refundable state EIC provides a credit to a household in excess of any state income taxes owed while a non-refundable EIC may eliminate a household's state income tax burden but does not provide a state income tax refund.[16]

The probability of FSP participation for household *i* living in state *s* in month *m* of year *y* is a function of his or her EITC and EIC receipt in the previous year and control variables in the current month:

$$Probability\ of\ FSP\ Participation_{ismy} = F(E_{isy-1}, X_{ismy})$$

where F is a logistic function.[17]

The vector E represents the EITC-related variables including:

- Actual EITC benefits claimed; and
- Implementation of refundable state EIC programs.

The vector *X* represents variables other than the EITC that may affect food stamp participation (control variables) including:

- Macroeconomic variables;
- Welfare program variables;
- Demographic variables;
- Employment status variables;
- Income and assets variables;
- Implementation of statewide Electronic Benefits Transfer (EBT) programs; and

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[16] For very low-income households (e.g., those leaving welfare and entering the workforce) a non-refundable EIC may not provide a significant financial benefit since their state income tax burden is likely to be low or nonexistent. Moreover, states without an income tax are *more* generous to low-income households than states with a non-refundable EIC programs but are *less* generous than states with refundable EIC programs.

[17] The logistic function F(Z) is given by exp(z)/[1+exp(z)].

- Political affiliation of the state's governor.

We present a reduced form of model 1 excluding variables that may be endogenous (e.g., employment status, spousal employment status, TANF participation, and actual TANF benefits received). Specifically, we are concerned about the endogeneity of a household head's employment status, for example, which may simultaneously affect the likelihood of participating in the FSP and be affected by EITC. We then present the full form of model 1 including these potentially endogenous variables (see Table 3).

Finally, to determine if the timing of the receipt of EITC benefits impacts food stamp receipt, we also investigate whether federal EITC receipt has a seasonal effect. We do this by running an alternate version of the full form model 1 using trimester variables interacted with actual EITC benefits claimed (see Table 4). The variables are described in detail in Section IV below.

Model 2: The Relationship Between Computed EITC Benefits a Household is Eligible for and Food Stamp Program Participation Considering State EIC Implementation

In our second model, we replace actual EITC benefits claimed with a computed variable measuring the EITC benefits a household should be eligible for given their household size and earned income. All other variables in model 2 remain the same as in model 1. A description of how EITC benefits were computed for each household is given in Section IV below.

We use the second model in case actual EITC benefits are not completely exogenous. That is, since we believe it is possible that some unobserved variables may affect both the likelihood of participating in the FSP and of receiving EITC, we are concerned that using actual EITC benefits would result in biased and inconsistent estimates. For example, knowledge about federal income support programs is an unobservable factor that may make a household more likely to participate in food stamps and receive EITC. We tested this by regressing actual EITC benefits on the computed EITC benefits (plus our other control variables) and then including the residuals from this regression in an ordinary least squares regression of food stamp participation on actual EITC benefits and our controls.[18] While our results did not conclusively demonstrate that there was an endogeneity problem with using actual EITC benefits, they did suggest it was possible.

[18] We use Stata's Hausman command to test whether the differences between the instrumental variables two-stage least squares (2SLS) regression and ordinary least squares (OLS) estimates are large enough to suggest that the OLS estimates are not consistent. Our results indicate that there is not a significant difference between the 2SLS and the OLS coefficients, indicating that OLS is not an inconsistent estimator in this equation.

For model 2, we present both reduced and full form results (see Table 5). We also present results for an alternate version of model 2 using trimester variables interacted with computed EITC benefits claimed (see Table 6).[19]

Model 3: Difference-in-Difference Approach to Examining the Role of EITC in Affecting Food Stamp Participation

This model builds on the idea that EITC may reduce food stamp participation by reducing the urgency of claiming benefits without reducing potential food stamp benefits. The difference-in-difference approach provides a way of examining this possibility by distinguishing between differences in earnings that raise EITC benefits and differences in earnings that do not raise EITC benefits. Because the flat portion of the EITC schedule varies with the number of children, we compare households in which the same increase in earnings yields different changes in EITC. For example, we compare households with one child with households with two children (but the same household size) over earning ranges in which EITC remains constant in the one-child case but increases in the two-child case. If EITC benefits exert an impact despite having no effect on food stamp eligibility, then we would expect that food stamp participation to fall in the two-child case by more than the decline in the one-child case.

To operationalize this model, we specify the differences in group means that capture potential EITC impacts of food stamp participation as a function of earnings gains associated with and not associated with increases in EITC. We divide households into earnings and income ranges where earnings increases do and do not add to EITC. We then calculate how food stamp participation rates change with earnings between and within these ranges, and take the difference in changes in food stamp participation rates between those whose EITC increases and those whose EITC does not increase.

Using 2001 figures, we divide households into the following earnings ranges by number of children. Within each range, we divide households into groups based on increments to earnings.

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[19] As an alternative specification for models 1 and 2, we also ran the logits separately depending on whether a household fell on the increasing, flat, or decreasing portion of the EITC curve (review Figure 2 to see the structure of the EITC curve). For example, a household eligible for $200 in EITC income could be either on the increasing part of the EITC curve (indicating a low household income) or the decreasing part of the curve (indicating a higher household income). Therefore, we split the sample into thirds depending on annual household income in each year and the number of children in the household. When we ran the regressions for model 1 and 2 on each of these three samples, the small number of observations resulted in few significant relationships.

Earnings Range	EITC rules
$0-$7,499	EITC increases for all households with children over this range
$7,500-$9,999	EITC is constant for households with one child, but increases for households with more than one child
$10,000-$12,999	EITC is constant for all households in this range
$13,000+	EITC declines with added earnings over this range

Since EITC does not affect food stamp benefits, the added EITC income can only affect households by influencing their need for food stamps, not their potential benefits.

The difference-in-difference comparisons are as follows. Let P_{ijk} = percentage of each household group that participates in the FSP *i* (where *i* = 1, 2, and 3 based on the number of children in the household), earnings group *j*, where j = 0, 1, 2, and 3 based on the classifications listed in the table, and *k* is the number of changes in earnings above the bottom of the initial level (say, a *k* of 3 in earnings group 2 would be $1,000-$1,500 above $7,500); and E_{ijk} = average earnings of household group *i* in earnings group j and at the *k*th increment to earnings.

To identify whether EITC affects food stamp participation, we first calculate the difference in the food stamp participation rate (P) between each range *j*. We then specify the average change in P divided by the average change in earnings within each range and for each household type. We then compute the difference in the average changes in P relative to E between households with one, two, and three children. If EITC dollars reduced food stamp benefits there, we would expect to observe a larger decline in P relative to E for households with two children than for households with one child when earnings increases over the range j = 2 ($7,500-$9,999), but not over the ranges j = 1 or j = 3. Further, we should observe no difference in these ranges between households with two children versus households with three children. We make these comparisons based on current year earnings in each of three years (1997, 1998, and 1999) and the food stamp participation rate over the year (the share of eligible months households received food stamps) as the food stamp participation specification.

A second strategy is to estimate regressions based on spline functions that divide the impact of earnings on food stamp participation rates into several distinct effects that can vary within earnings segments. As above, the five earnings segments are determined by the way the EITC varies with earnings for each household type. In the first segment, EITC increases with earnings for all families with children. In the second segment of earnings, each $1 of earnings adds 40 percent of a $1 in added EITC for families with two or more children but adds nothing to EITC for families with only one child. If EITC were to exert an independent and negative effect on

food stamp participation, then we should observe a larger decline in participation per dollar of earnings over this range of earnings for families with two or more children than for one-child families. The third range is the area where EITC remains constant with each $1 of earnings. In the subsequent two segments, EITC declines with each added $1 of earnings, but phases out more quickly for one-child families. Under the spline function, the slopes are constrained in a way that insures continuity. With the regression strategy, we can simultaneously test for separate earnings effects while holding constant for other independent factors influencing food stamp participation.

IV. Data

Survey of Income and Program Participation

We use the 1996 panel of the Survey of Income and Program Participation (SIPP) as our primary data source. The SIPP is a large-scale, national survey sponsored by the U.S. Census Bureau. The SIPP collects information about sources and amounts of income, labor force information, program participation, and demographic characteristics. The SIPP is designed "to measure the effectiveness of existing federal, state, and local programs; to estimate future costs and coverage for government programs, such as food stamps; and to provide improved statistics on the distribution of income in the country."[20] In addition to the SIPP, we supplement our analyses with state-level information including: state EIC implementation, monthly state unemployment rates, annual state employment growth rates, Electronic Benefits Transfer (EBT), TANF implementation, and political affiliation of states' governors. These additional variables and their sources are discussed in greater detail below.

The SIPP's core survey collects monthly information from a stratified sample of the U.S. civilian noninstitutionalized population. The core questions collect information pertaining to the labor force participation, program participation, and income questions which help measure the nation's economic situation. The 1996 panel includes interview data from December 1995 through March 2000 and has a sample size of 40,188 households. Household members are interviewed in four-month intervals—where each 4-month period is called a "wave"—and information is collected for each of the preceding four months.

The SIPP supplements the core survey in each wave with detailed topical modules that provide information including but not limited to past participation in the Food Stamp Program. Another

three topical modules ask questions about taxes (in waves four, seven, and ten in the 1996 panel) including two questions about the EITC: (1) Did you claim an earned income credit on your federal income tax return?; and (2) What was the amount of earned income credit claimed? The 1996 SIPP panel gathers EITC information as part of the tax topical models in tax filing years 1996, 1997, and 1998.

The unit of analysis is individual household heads ages 18 through 60. Although individuals are our unit of analysis, many of our variables are measured at the household level. We use monthly data, and our unit of observation is the person-month.[21]

Underreporting of Food Stamp Receipt in the SIPP. Underreporting of FSP participation is an issue when using the SIPP survey data as it is for other transfer programs (e.g., AFDC/TANF, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Medicaid). Bitler et al. (2002) compare transfer program participation as measured in Food and Nutrition Service administrative data and 1996 SIPP panel data. Bitler et al. (2002) find that the SIPP underreports food stamp participation by about ten percent annually. Cody and Tuttle (2002) estimate the underreporting of food stamp receipt in the SIPP to be between seven and 19 percent. Therefore, while underreporting of food stamp receipt is an issue to be noted, we cannot correct for it in our analysis and any bias introduced is likely to be randomly distributed.

Low Response Rate for EITC Participation in the SIPP. The 1996 SIPP panel measures whether EITC was claimed in 1997, 1998, and 1999. Unfortunately, much of these data are missing or unreported. Of our study population,[22] approximately 65 percent of respondents either refused, don't know, or did not answer the question asking about whether the EITC was claimed. The remaining approximately 35 percent of respondents answered "yes" or "no." Of those respondents who answered yes, approximately 51 percent reported the actual amount of EITC claimed, while the remaining 49 percent either refused or said don't know. These missing data affect our independent variable of interest in model 1—actual EITC claimed—and led us (along with concerns about endogeneity) to compute the EITC a household would be eligible for—the primary independent variable of interest for model 2. Although we know of no systematic bias introduced by these missing data, they should be kept in mind when considering our results.

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[20] U.S. Census Bureau. *Overview of the Survey of Income and Program Participation (SIPP).* http://www.sipp.census.gov/sipp/overview.html (Accessed August 2003).

[21] One issue in using the SIPP is how to treat data from multiple months for a given case. Multiple observations for the same case are likely correlated and thus need to be accounted for in calculating the standard errors. We obtain standard errors that account for non-independence of the cases using Stata's cluster option.

Seam Bias in the SIPP. We use monthly data rather than wave-specific (every four months) data. We note that using the monthly data does not allow us to avoid the "seam bias"—SIPP participants tend to report the same information for all four months of a reference wave. Therefore, in cases where seam bias is problematic, we do not expect to see a change in information within a wave but do expect information changes between waves with the start of the new reference month 1. Past research using the SIPP has addressed the seam bias by using wave-specific data, using only data from month four of every wave (Grogger 2003), or controlling for seam bias by using an indicator for the reference month one (Blank and Ruggles 1996). Since many of our SIPP and non-SIPP variables (e.g., state unemployment rate, state waiver program implementation, TANF implementation, etc.) are available monthly, we believe that the additional information obtained from the monthly data outweigh the concerns about seam bias. We control for seam bias by using an indicator variable for reference month one in our models.

Attrition in the SIPP. The 1996 SIPP panel is 48 months long which makes it susceptible to attrition. The initial response rates for SIPP panels are about 80 percent with final response rates about 67 to 74 percent (Logan et al. 2002). The 1996 SIPP Panel oversamples economically disadvantaged groups (e.g., African Americans, Hispanic whites, and female-headed households) (Logan et al. 2002). While attrition is a concern in the SIPP as it is in other longitudinal survey data, the data are weighted to account for attrition, nonresponse, and differential sampling rates.

Weighting the Data. We use SIPP person weights for our descriptive analyses and our multivariate analyses.

Variables Used in the Analysis

Using the 1996 SIPP panel, we define our dependent and independent variables as described in our empirical approach. Our dependent variable is Food Stamp Program participation which equals one if a household head or spouse participates in the FSP during a given month and zero otherwise.[23]

Federal EITC Measures. Federal EITC participation is measured in two ways. First, the *actual* amount of EITC claimed for tax years 1996, 1997, and 1998 is used as measured in the tax topical module. Actual EITC claimed is used as the primary independent variable of interest in

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[22] Recall that our study population includes households below 130 percent of the poverty line with assets less than or equal to $2,000, or $3,000 if at least one household member is age 60 or older.
[23] FSP child-only cases are not measured in the SIPP.

model 1. Actual EITC is measured in three variables that indicate whether the amount received was low ($1-$999), medium ($1,000-$1,999), or high ($2,000+). Actual EITC indicators were created because actual EITC claimed is measured as a categorical variable in the SIPP. Actual EITC claimed is *linked to data for the household in the year in which the credit was received not the tax year for which it was claimed*—the previous year. For example, EITC claimed for income earned in tax year 1996 is linked to data for the household in 1997 when the credit was received. We do this because we believe the income received from EITC affects behavior of the household (e.g., food stamp participation) when it is received. Although it is also plausible to believe that households alter their working behavior during the tax year to change the amount of EITC received the following year, we believe this effect is less influential on food stamp participation.

Second, given the amount of missing data for the actual EITC claimed in the tax module, we compute the amount of EITC a household *should be eligible for*. We use the computed EITC amount as the primary independent variable of interest in model 2. We use the following characteristics of the household to compute the amount of EITC a household is eligible for in each tax year: number of children,[24,25] earned income,[26] phase-in rate, phase-out rate, income at which phase-out begins, and the minimum and maximum earned income in each year for EITC eligibility

The total income excluding cash assistance is computed by adding together the total monthly income of the head and spouse, if any, over the calendar year and subtracting the amount of cash assistance received by the household head's family during the year. If this total income is larger than the value for income at which phase-out begins then the difference between the total and the phase-out value is multiplied by the phase-out rate, and subtracted from the maximum amount of credit the household is eligible for. The remaining amount is the estimated value of the EITC for which the household is eligible.

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[24] Number of children in the household during the year was calculated by taking the average number of children present during each month of the year, and rounding that value up at .25 to account for children who are born during the year (for example 1.2=1 and 1.25=2). We concluded that households have children for part of the year if a new child joins or leaves the household due to birth or changing household composition. In the case of birth, the household may claim the child for EITC, in the case of a child joining or leaving the household, the household may or may not be able to claim the child.

[25] The number of children and tax year are used to match the phase-in rate, phase-out rate, income at which phase-out begins, minimum and maximum earned income for EITC eligibility, and maximum credit to each household.

[26] Earned income is calculated by adding the monthly earnings of the household head and spouse, if any, for the calendar year. The earned income is used to determine the maximum amount of EITC the household is eligible for before phase-out.

State EIC. To measure the impact of state earned income credit programs, we include an indicator variable measuring whether and in what year a refundable EIC was implemented in every state.[27] It is important to include refundability as part of the variable definition, rather than simply noting whether or not a state has an EIC program. This is because a state with a refundable EIC provides greater benefit to low-income workers than does a state without an income tax. And, a state without income tax, in turn, provides greater benefit to low-income workers than does a state with a non-refundable income tax (see textbox on page 3-4).[28]

Food Stamp Program Characteristics. We include an indicator measuring whether and in what month the Electronic Benefits Transfer (EBT) was implemented statewide in every state.[29]

Employment Characteristics. Several measures of employment status and labor force participation of the household head and spouse are included. Employment is measured for the household head with indicator variables for whether the individual is employed or in the labor force but unemployed, with out of the labor force as the omitted category.

Welfare Reform Conditions. We include measures for both the implementation of welfare reform and the presence of state waiver programs. TANF implementation is measured using an indicator that equals one when TANF was implemented statewide. The waiver indicator equals one if a major waiver program was in effect; the indicator equals zero before the waiver program was implemented and when TANF was implemented and replaced the waiver program. To estimate the impact of TANF benefits on household behavior, we include both an indicator measuring household head participation in TANF and the amount of benefits a household received.

Macroeconomic Conditions. To estimate the impact of the economic conditions on food stamp participation, we use the seasonally adjusted monthly unemployment rate for each state as reported in the Local Area Unemployment Statistics data series by the U.S. Bureau of Labor Statistics. We also use the annual state employment growth rate for the non-institutionalized

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[27] State EIC information taken from "A Hand Up: How State Earned Income Tax Credits Help Working Families Escape Poverty in 2001" by Nicholas Johnson, Center on Budget and Policy Priorities, December 2001.

[28] Maine and Vermont have the same state FIPS code in the SIPP. Vermont has a refundable EIC for 1996 through the present while Maine has a non-refundable EIC for 2000 only. Twenty-nine percent of the total 86,964 federal EITC tax claimants from both states in 2001 were from Vermont (Source: Internal Revenue Service special tabulations for USDA Economic Research Service). Thus, on balance, the joint EIC benefit for Vermont/Maine is calculated as closer to zero than one and is set to zero.

[29] EBT implementation information was collected from USDA's Food and Nutrition Service website http://www.fns.usda.gov/fsp/ebt/ebt_status_report.htm.

civilian population over 16 years of age[30] using data available through the U.S. Bureau of Labor Statistics.

Demographic Characteristics. Demographic characteristics are measured for the household head in each month. Age is measured as a continuous variable. Race and ethnicity are measured with indicators for whether the household head is non-Hispanic black, non-Hispanic other, and Hispanic, where non-Hispanic white is the omitted category. Education level is measured with two indicator variables for whether the household head has a high school education or greater than a high school education, where less than a high school education is the omitted category. A binary indicator variable is included to measure whether the household head is female. Region of residence is measured with indicator variables for East, Central, and West, where South is the omitted category.

Several variables are included to describe the household composition including household size, whether there are two adults in the household,[31] and the ages of any children in the household. Children are measured using indicator variables for whether the children are ages 0 to 2 or ages 3 to 5, with ages 6 to 17 being the omitted category.

Other Measures. To determine if the timing of the receipt of EITC benefits impacts food stamp receipt, we measure whether federal EITC receipt has a seasonal effect. Since over 98 percent of EITC claimants receive their benefits in a lump sum,[32] it is plausible that any effect on food stamp participation is greater in the months around when the lump sum is received. To test this, we interact a variable for each of the three trimesters of the year with the three indicators measuring actual EITC claimed.

To isolate the impact, if any, of state government, we include indicator variables for whether a state has a governor who is a Democrat or an Independent, with Republican being the omitted category.

V. Findings

Our empirical results indicate there are many significant determinants of FSP program participation. First, we present the results of the descriptive analyses identifying patterns of

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[30] The employment growth rate for year t is defined as $t = Log(EMP_t)-Log(EMP_t-1)$, where $Log(EMP_t)$ = Log(state employment/state total population).

[31] We used an indicator for whether there are two adults in the household instead of marital status because it more accurately captures the existence of two potential wage earners in the household.

federal EITC receipt, food stamp receipt, and joint EITC-food stamp receipt among several subgroups of interest. Second, we present the results of the multivariate analyses for models 1, 2, and 3 examining factors that affect FSP participation, holding other variables constant. The results from all three models are statistically significant, however, the results vary making it difficult to determine the degree to which federal EITC receipt is related to FSP participation and how the two income support programs interact.

Patterns of Joint EITC and Food Stamp Receipt Over Time

The food stamp participation measures capture each month's activity as well as months of participation during each year. We present the SIPP data as reported and/or imputed by the Bureau of the Census, despite the apparent underreporting of food stamp benefits and the EITC.

The panel nature of the data allows a long-term picture of participation. For the descriptive analyses, we define food stamps eligibility as having an income under 130 percent of the poverty line and having low enough assets to qualify for food stamps in at least some of the relevant period. Of household heads ever eligible on this basis during the 1996-1999 period, only about 22 percent reported ever participating. Even among those with 12 months or more of food stamp eligibility based on this income threshold, only about half obtained at least one month of food stamps over the period. However, the households that ever obtained food stamps did so for a long period. The sample of those ever eligible divides into two groups:

1. Those who never participated in the program; this group makes up about 78 percent of eligibles, despite averaging over seven months of income eligibility; and

2. Those who participated in the program at least one month; this group had 17.6 months of participation out of 22 months of eligibility.

Table 1 presents data showing the 1996-99 decline in the proportion of food stamp eligibles participating in the program by subgroup. In a typical month, participation rates were substantially higher for households with unmarried heads, for those not employed, and for those employed. Among employed, but unmarried, less than half of the eligibles obtained food stamps in a typical month.

Receipt of EITC, as reported to SIPP interviewers, fell far below participation in food stamps, even among families with children that had low incomes at some point over the 1996-1999

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[32] Hotz, V. Joseph and John Karl Scholz. 2000. *The Earned Income Tax Credit*. Paper for the NBER Conference on Means-Tested Transfers, July, p. 54.

period. However, as Table 2 shows, 50-60 percent of these respondents did not provide any answer to the relevant questions about their taxes. Of families with children eligible for food stamps in the relevant year, only 14-18 percent stated they received an EITC benefit in 1997-1999 (based on their prior year's income). At the same time, food stamp eligibles reporting EITC receipt made up 41-44 percent of those who responded "yes" or "no" to the EITC receipt question. These figures are quite low in comparison to the estimates of over 80 percent EITC participation rates derived from an Internal Revenue Service study that matched tax records with records from the national sample interview in the Current Population Survey.[33]

Perhaps not surprisingly, reported take-up of EITC was considerably higher among those who participated in food stamps. As Table 2 shows, 71-78 percent of those who obtained food stamps in a given year *and* responded to the EITC question stated that they claimed the EITC. These figures were nearly double the participation reported by food stamp eligibles who did not participate in food stamps in the current year. The problem with these reported EITC claims is the large share of respondents who simply did not answer questions about their taxes. Of the food stamp participants asked the question about whether they received EITC, only 21-31 percent responded "yes" and about nine percent responded "no."

One alternative to using self-reported claims about EITC involves simulated EITC eligibility based on earnings, other income, number of children, and the EITC rules. Unfortunately, while we can simulate eligibility, we cannot easily capture individual use of EITC. A common assumption is that all or nearly all heads of families with children who are eligible for EITC actually file a tax return and obtain the credits. Using this upper bound estimate, we can see a substantial overlap between food stamp participation and EITC. Of those receiving food stamps in 1997, about half were eligible for EITC on the basis of 1997 earnings and other income. The figure was virtually identical for the other years.

What about those eligible for food stamps, especially those who did not claim benefits? Household heads that reported receiving EITC represented 15-19 percent of food stamp eligibles but about 50 percent of food stamp eligibles that responded "yes" or "no" to the tax question. The overlap was larger between those who were eligible but not receiving food stamps and EITC receipt. About 14-18 percent of eligible, nonparticipants said they received EITC, but this group constituted 41-44 percent of those responding to the EITC question.

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[33] Internal Revenue Service. 2002. *Participation in the Earned Income Tax Credit Program for Tax Year 1996*. Fiscal Year 2001 Research Project #12.26. Prepared by SB/SE Research.

Given the substantial underreporting, it is instructive to ask about the overlap between food stamp eligibility and EITC eligibility. We know that the eligibility overlap overstates the overlap in participation because of food stamp participation rates are well below 100 percent. But, this dual eligibility describes what existing law intends in structuring government help to low-income working families. These figures reveal a substantial overlap.

In 1997, for example, nearly 73 percent of food stamp eligible households with children qualified for EITC and 72 percent of EITC eligibles qualified for food stamps. The percentage of EITC eligibles qualifying for food stamps remained constant at about 70 percent in 1998 and 1999. At the same time, the rate at which food stamp recipients were eligible for EITC fell markedly to about 45-47 percent. As employment among low-income household heads increased between 1997 and 1999, it is plausible that the eligibility overlap would have increased as a greater number of low-income households have earnings (thus making them eligible for EITC in addition to food stamps). The observed decrease in eligibility overlap between 1997 and 1999 is somewhat surprising.

The Relationship Between Federal EITC Benefits and Food Stamp Program Participation Considering State EIC Programs

In this section we present the results of logit models 1 and 2. We begin by briefly discussing the overall results for each model and include a discussion of some caveats associated with our findings for each model. We then discuss our results in more detail emphasizing the full form results for the independent variables for both models 1 and 2.[34]

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[34] The directional effect (e.g., positive or negative) of an independent variable in the logit models can be determined from the sign of its coefficient. However, the coefficient does not clearly indicate the marginal effect of that variable on the probability of food stamp participation. We determine the marginal effects as follows. The coefficient values represent the effect of a change in an independent variable on F^{-1} (probability of food stamp participation) where $F^{-1}(\bullet)$ is the inverse function of the logistic cumulative density function. Consequently, the interpretation of logit estimates is not intuitive. To get the increase in the probability of food stamp participation given a one-unit increase in an independent variable, one must instead look at converted estimates. We convert the estimates to determine the marginal effects as follows.

For indicator (0-1) independent variables, we calculate (1) the predicted probability of food stamp participation when the indicator variable is set to one and all other characteristics are set to the mean for the population, and (2) the predicted probability of food stamp participation when the indicator variable set to zero and all other characteristics set to the mean for the population. The marginal effect is the difference between the predicted probability in (1) and the predicted probability in (2). For continuous variables in the logit models, the procedure is similar, except that we determine the change in predicted probabilities from a one-unit change in the given independent variable from its mean value when all other

Model 1 Results. The results of the reduced and full forms of logit model 1 indicate that the federal EITC claimed is positively and significantly related to FSP participation (Table 3). For the full form model, we find that the coefficient for the low ($1-$999) amount of actual EITC claimed is significantly different from the coefficients on the medium ($1,000-$1,999) and high ($2,000+) amounts at the ten percent level. For the reduced form model, we find that the coefficient for the low ($1-$999) amount of actual EITC claimed is significantly different from the high coefficient, however, the low and medium and high and medium coefficients are not significantly different from one another.

On the other hand, model 1 yields a negative and statistically significant impact of refundable state EIC programs on FSP participation. There is a small difference in magnitude between the reduced form and full form results for the refundable state EIC variable in model 1.

As discussed earlier, the vast majority of EITC recipients receive the benefit in a lump sum payment between January and April. Therefore, we might expect that the decision to participate in the Food Stamp Program would be affected by the seasonal nature of EITC benefits. To determine whether the *timing* of the actual EITC benefits claimed affects the relationship between the EITC claimed and FSP benefits, we interacted a calendar trimester variable (i.e., January-April, May-August, and September-December) with low, medium, and high amounts of EITC benefits claimed. As Table 4 shows, there is not a significant difference between the coefficients of the actual EITC variable interacted with the calendar trimester.[35] That is, we find no evidence of a seasonal effect of actual EITC on FSP participation.

Thus, the coefficients on the federal EITC variables suggest that households that claim EITC are more likely to participate in food stamps, though there does not appear to be a strong relationship between the amount of EITC claimed and food stamp participation. On the other hand, the coefficient on the refundable state EIC variable suggests that greater earned income credits reduce a household's likelihood of participating in the FSP. Because, as discussed earlier, there is much missing data for EITC claimed in the SIPP, we are very skeptical of the results for the effect of the federal EITC. Furthermore, because federal EITC is determined by a household's number of children and income, it is possible that the coefficients on the EITC variables simply reflect a more complicated relationship between income, number of children, and food stamp participation than our control variables capture on their own. So, while the results of model 1 do

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independent variables are set to their mean values. The converted values are then the increase in probability of food stamp participation due to an independent variable.

[35] The results for the explanatory variables other than actual EITC claimed interacted with the trimester indicator variables are very similar to results reported in Table 3 and, therefore, are not repeated in Table 4.

suggest that households that claim EITC may be more likely to participate in food stamps, they certainly do not prove that this relationship exists. Moreover, there is nothing in the model 1 results that suggests that increasing the generosity of the EITC increases food stamp participation.

Model 2 Results. In sharp contrast to the model 1 results, model 2 estimates based on computed EITC benefits show a negative and statistically significant effect of EITC on FSP participation. However, the magnitude of the EITC effects declines as the amount of computed federal EITC benefits increases (Table 5). The results of the full form model 2 indicate that the effect of computed federal EITC is negative and significant for medium and low amounts of EITC ($1-$999 and $1,000-$1,999) and negative but not significant for high amounts of EITC ($2,000+). Again, we find that the coefficients for the low ($1-$999) and medium ($1,000-$1,999) amount of computed EITC are not significantly different from one another, however, the coefficients on the low and medium amounts are each significantly different at the ten percent level from the coefficient on the high amount ($2,000+).

Also in contract with model 1, the full and reduced forms of model 2 indicate that refundable state EIC programs do not have a statistically significant impact on FSP participation.

Table 6 shows the results for model 2 (for the full form only) measuring the seasonality of EITC benefits a household would be eligible to receive confirm the overall results above for seasonal model 1.[36] We find that the trimester coefficients are not significantly different from one another in model 2. That is, model 2 provides no evidence of a seasonal effect of computed EITC on FSP participation.

We turn now to a discussion of findings for particular explanatory variables for both models 1 and 2.

Federal EITC Measures. As discussed above, the results of the full form model 1 indicate that actual federal EITC claimed is positively and significantly related to FSP participation (Table 3). Specifically, the likelihood that a household head participates in the FSP increases by 2.4 percentage points if the household claims EITC of under $1,000 (as compared to households claiming no EITC benefits). For households claiming a medium and high federal EITC the increase is 4.2 and 5.5 percentage points, respectively.

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[36] The results for the explanatory variables other than EITC a household is eligible for interacted with the trimester indicator variables are very similar to results reported in Table 5 and, therefore, are not repeated in Table 6.

The results of the full form model 2 find that computed federal EITC is negative and significant for low ($1-$999) and medium ($1,000-$1,999) levels of EITC, however, high ($2,000) is not significantly different from those households who are not eligible for EITC. Specifically, the likelihood that a household head participates in the FSP decreases by 2.2 and 2.4 percentage points if the household head is eligible for $1-$999 and $1,000-$1,999 of EITC income, respectively.

The results in model 2 indicate a very different effect of EITC on FSP participation than model 1. This may be because (1) the actual federal EITC benefits a household claims is, at least in part, affected by unobserved factors that also affect FSP participation (such as knowledge of federal programs), making the coefficient on actual EITC benefits in model 1 biased due to omitted variable bias; or (2) actual EITC claimed is inaccurate as measured in the SIPP, and EITC benefits a household is eligible for is more accurately measuring the relationship between EITC and FSP participation. With respect to explanation (1), as discussed above, we tested whether actual EITC claimed is endogenous. While we could not reject the null hypothesis of exogeneity at the five percent level, but we could reject it at the ten percent level, suggesting that our EITC variable in model 1 might be endogenous.

State EIC Measures. The results estimating the impact of refundable state EIC programs differ for models 1 and 2 (Tables 3 and 5). In model 1, the refundable state EIC variable is significant and negatively related to FSP participation. On average, a household in a state with a refundable EIC program is 1.5 percentage points less likely to participate in food stamps (Table 3). In model 2, on the other hand, the refundable state EIC is not a significant predictor of FSP participation (Table 5).

Food Stamp Program Variables. Models 1 and 2 indicate that the implementation of Electronic Benefits Transfer (EBT) systems in states does not have a significant impact on FSP participation in the reduced form or the full results.

Welfare Program Variables. We include four welfare program variables in models 1 and 2—two are measures of welfare program participation: (1) an indicator measuring TANF participation, and (2) the amount of TANF benefits received; and two are measures of welfare implementation: (1) presence of a state waiver program, and (2) TANF implementation statewide.

The welfare program participation measures are omitted from the reduced form models 1 and 2 due to endogeneity concerns. In the full form models 1 and 2, TANF participation has a positive and significant impact on food stamp participation. An average household participating in TANF is 32.0 percentage points more likely to participate in food stamps according to model 1

(Table 3) and 44.5 percentage points more likely to participate in food stamps according to results from model 2 (Table 5). In addition, for an average household, receiving an additional $100 in TANF benefits results in a 0.8 percentage point increase in food stamp participation for model 2, while TANF benefits received was not significant in the full form model 1.

Of our two measures of welfare implementation—presence of a state waiver program and TANF implementation statewide—only the former is significant and negative in both reduced and full form model 2, while neither are significant in reduced and full form model 1. A state waiver program has a negative impact (-0.8% or –2.1%, reduced and full form, respectively) on food stamp program participation in model 2. The magnitude and negative findings are consistent with findings from other studies measuring implementation using waiver dummy variables (Wilde et al. 2000; Wallace and Blank 1999). Studies that use PRWORA or state welfare rules tend to find greater negative impacts (Currie and Grogger 2001; Gleason et al. 2001).

Macroeconomic Conditions. Our results for full and reduced form model 1 indicate that the monthly state unemployment rate does not have a significant impact of FSP participation. The annual state employment growth rate, on the other hand, is negative and significant in full form model 1.

Our results for reduced form model 2 indicate that the monthly state unemployment rate has a significant and positive impact on FSP participation while the annual state employment growth rate does not have an impact. The significance of the monthly state unemployment rate is explained away in full form model 2 when individual-level employment status variables are introduced into the model. While other studies find strong relationships between the unemployment rate and declines in food stamp participation, this relationship is quite likely due to the correlation between the unemployment rate and the employment status of individuals eligible for food stamps.[37] Since our regressions control for individual employment status, this correlation will not affect the coefficients on the macroeconomic variables.

Employment Status. As discussed above, due to concerns about endogeneity, we omit the employment status of the household head and spouse from our reduced form models 1 and 2. As full form models 1 and 2 show, employment by the household head and spouse (compared to unemployment) are both significant and negatively impact food stamp participation (Tables 3 and 5) for the average household. Employment by the household head makes participation in the FSP 1.1 percentage points less likely than for an average household where the head of the

[37] This result may also be due to the limited variation in the unemployment rate over the time period and the noise due to our use of monthly data.

household is out of the labor force (Table 3). Results for model 2 confirm these results with an employed household head being 3.6 percentage points less likely to participate in food stamps than a household head that is out of the labor force (Table 5). Spousal employment reduces participation in the FSP by 1.9 and 3.6 percentage points in models 1 and 2, respectively.

Likewise, heads of household that are in the labor force but not employed are also less likely to participate in food stamps (-1.4 percentage points for model 2) than a household where the head is out of the labor force. Having a spouse in the labor force but unemployed is not a significant predictor of food stamp participation.

Income and Assets Measures. Not surprisingly, a household's total income and assets negatively impact Food Stamp Program participation. We find that an additional $1,000 in total household income makes an average household 5.2 percentage points less likely to participate in food stamps as indicated by full form model 2. Likewise, an additional $1,000 in household assets also reduces participation in the FSP, by 4.7 percentage points according to full form model 2. The effect of household income-squared is positive, however, the overall effect of household income is negative for households within our sample since the breakeven point is well above the income levels in our sample.

Demographic Characteristics. Our results for full form models 1 and 2 indicate that several demographic characteristics are significant negative predictors of food stamp participation (Tables 3 and 5). Household heads that have a greater than high school education are significantly less likely to participate in food stamps than household heads with less than a high school education in model 2 (the relationship is negative but not significant in model 1). Not surprisingly, an average two-adult household is less likely to participate in food stamps compared to a single-adult household according to models 1 and 2.

Our results for models 1 and 2 also indicate that several demographic characteristics are significant positive predictors of food stamp participation (Tables 3 and 5). Households with young children ages 3-5 are more likely to participate in food stamps than households with children ages 6-17. Non-Hispanic African American household heads are somewhat more likely to participate in the FSP (0.9 and 1.5 percentage points more likely according to full form models 1 and 2, respectively) than non-Hispanic white households. On average, households with a female head are also more likely to participate in food stamps. Finally, not surprisingly, larger households are more likely to participate in food stamps; each additional household member increases the likelihood of participating in food stamps by 1.2 and 0.9 percentage points according to full form models 1 and 2, respectively.

Difference-in-Difference Approach to Examining the Relationship Between the EITC and Food Stamp Participation

This section checks for potential EITC impacts using an alternative approach. As noted above, though the added income from EITC does not reduce food stamp eligibility, EITC payments could nevertheless lower food stamp participation by helping families afford food without obtaining food stamps. Another possibility is that families gaining income from EITC become less willing to bear the transaction costs associated with applying for food stamps. Finding such effects is complicated by the fact that EITC increases go together with increased earnings. Thus, over an earnings gain in which EITC is increasing, food stamp participation might decline because of added earnings or because of added EITC payments. This model attempts to distinguish between these two effects by comparing situations in which the same increases in earnings lead to or do not lead to an increase in EITC.

Such situations arise because families moving through the same segments of earnings will see increases or no increase in EITC depending on whether they have one child or two or more children. We can take advantage of this program feature by using a difference-in-difference methodology. This approach allows for the possibility that the level of food stamp participation rates may differ between families with one child and families with two or more children for reasons than EITC. The focus is on how differences in the way EITC *changes* for families with the same change in earnings affect *changes* in participation rates. For example, in 1999, families within the $6,801-9,540 range of earnings saw either no change in their EITC payment with an increase in earnings (a one-child household) or a rise in EITC of 40% of each increase in earnings (a household with two or more children). If higher EITC levels reduced food stamp participation rates independently of gains in earnings, the decline in participation rates should be more rapid in this range for families with two or more children than for families with one child as their earnings increased in this range.

Table 7 provides some suggestive evidence of this differential change in participation rates. Although the earnings ranges vary by year in line with EITC program rules, the earnings segments are:

- Zero earnings;
- EITC increases with earnings for both groups of families;
- EITC increases with earnings for 2+ children families and remains flat for one-child families;
- EITC remains flat with earnings for both groups of families; and

- EITC declines for both groups of families.

The focus is on the earnings range where a change in earnings raises EITC for 2+ children families and leaves EITC constant for one-child families. As the Table 7 reveals in the third row of each panel, food stamp participation rates in all four years decline more rapidly over this range for 2+ children families than for one-child families. For example, in 1998, the participation rate was virtually unchanged for one-child families (up +1.2 percentage point), but declined by 12.4 percentage points for 2+ children families. Thus, as the italicized row shows, the difference in the reduction in food stamp participation was –13.6 percentage points; that is, food stamp participation rates declined nearly 13.6 percentage points more for 2+child families than for one-child families. Although this tendency for faster reductions for families subject to EITC increases than for families subject to flat EITC payments prevailed in all years, the difference-in-differences across years ranged widely from -3 to -24 percentage points. This suggests that the relationship is not particularly stable. Still, the direction of the changes were all consistent with a negative EITC effect on food stamp participation rates.

Another way to compare differential responsiveness to earnings is to divide changes in participation rates by changes in earnings. The bottom panel of Table 7 displays percentage point changes in food stamp participation per $1,000 increase in earnings across EITC-related earnings categories. Again, as the third row of the panel shows, the declines in food stamp participation are higher among families with 2+ children than among families with one child. Thus, the higher reductions for 2+ children families were not the result of higher earnings gains.

One can compare these difference-in-differences to a set of difference-in-differences in the subsequent earnings ranges. Earnings over flat ranges for both 2+ children families and one-child families do not involve increases in EITC for either household type. If the decline in participation among 2+ children families continued to exceed those for one-child families over this range, we might conclude that 2+ children families always respond more to earnings reductions than do one-child families. Such a result would cast doubt on the main difference-in-difference findings reported in Table 7. In fact, we find no tendency for a sharper reduction among 2+ children families in the flat range of EITC for both household types. On the row labeled, *EITC flat for one-child & 2+ children*, the reductions are typically larger among one-child families. Only in 1997 did participation rates decline faster in this segment for 2+ children families than for one-child families.

Table 7 provides other interesting results. Note that food stamp participation rates decline even when families have only a very modest amount of earnings. For example, while the row after zero represents an earnings level of only about $3,300-$3,800, the results show declines in food

stamp participation rates of about ten percentage points. Further declines in food stamp participation rates take place as earnings reach about $6,300-$6,800. By the time earnings rises to the flat EITC portion for one-child families, their participation rates have declined by 18-24 percentage points.

For an alternative approach to examining differences in the way one-child and 2+ children respond to earnings changes over various EITC ranges, we turn to the spline regressions. These regressions, reported in Table 8, yield estimates of the change in months of food stamp participation per $1,000 change in earnings within each EITC-related earnings category, controlling for months of food stamp eligibility, race, and education of the head of the household. The estimates cover 1997, 1998, and 1999 and relate only to those with at least some earnings. The dependent variable is months of food stamp participation in a calendar year in response to changes in earnings within categories in the prior year, since prior year earnings determine current year receipt of EITC.

The results provide evidence of a negative EITC effect in only one of the three years. In the 1998 regression, the spline coefficients for the key earnings category (EITC is flat for one-child household, increases for families with two or more children) operate in line with a negative EITC effect on months of food stamp participation (holding months of food stamp eligibility constant). Note in Table 8 that an added $1,000 of earnings within this category lowers food stamp participation by about 0.6 months for families with 2+ children; oddly, added earnings in this range appear to raise months of participation for families with one-child. In sharp contrast with these results, no similar pattern of differences in earnings coefficients appear in the 1997 and 1999 regressions. Thus, the results from the spline regressions offer no robust evidence of an EITC effect on food stamp participation rates.

VI. Conclusions

This study is the first to focus on examining the relationship between the EITC and FSP participation. It expands upon prior studies aimed at explaining declining food stamp participation rates in three important ways. First, we include measures estimating the impact of federal EITC benefits and the presence of refundable state EICs. Second, in addition to program implementation measures (e.g., presence of a state waiver program, TANF implementation, etc.) and macroeconomy measures (e.g., unemployment rate, employment growth rate), we include *individual-level* program participation information (e.g., amount of TANF benefits received, employment status, etc.). Third, we present difference-in-difference estimates resulting from the differential EITC formulas affecting families with one child and with 2+ children. In most cases, our findings are consistent with previous studies measuring factors associated with reductions in

food stamp participation (e.g., welfare waiver implementation, demographic characteristics). In other cases, our findings are inconsistent (e.g., macroeconomic conditions).

Our results suggest several important conclusions regarding the EITC and our dependent variable, FSP participation. In model 1, the primary independent variable of actual federal EITC claimed yielded a positive and statistically significant result. One possibility is that the positive coefficients on the federal EITC variables in model 1 are measuring the tendency of participants in one federal government program take advantage of other government transfer programs for which they are eligible. However, the TANF participation variable should capture much of this effect and a positive EITC effect remains even after controlling for TANF participation. Another possibility is that the small share of EITC eligibles reporting EITC receipt have unobserved characteristics that are positively correlated with participation in the FSP.

It is possible that the findings from model 1 reflect a structural positive relationship between EITC and FSP participation, and, if so, the FSP caseload declines might have been steeper in the post-welfare 1990s had there not been a large expansion in EITC. However, an important caveat to the findings for model 1 is the fact that the SIPP data do not effectively capture actual EITC claimed given high nonresponse rates on tax questions in the 1996 SIPP Panel, generally, and on the EITC questions, specifically. Therefore, we cannot draw the conclusion that the expanding EITC has increased FSP participation as model 1 suggests, given the negative and significant results of models 2 and 3.

In model 2, we find that *computed* federal EITC benefits available to a household yields a negative and statistically significant result. This provides some evidence that the added money households receive from EITC allows them to avoid taking up food stamps. It is possible, however, that the coefficients on EITC are measuring some complex relationship between income, household size, and food stamps that our controls do not capture. Furthermore, the fact that high levels of computed EITC benefits does not exert a statistically significant effect weakens the hypothesis that money received from EITC causes households to not participate in the FSP. There is no straightforward explanation as to why *only* low and medium EITC levels reduce FSP participation.

In model 3, the difference-in-difference tabulations between households with one child and households with two or more children also yielded modest evidence of a negative effect of EITC. The impact of earnings exerted a larger reduction in FSP participation for households whose incomes placed them on the increasing portion of the EITC benefit schedule than for families whose incomes placed them on the flat portion of the EITC benefit schedule. On the other hand, the negative EITC effect was not robust in the multivariate analyses involving spline regressions.

Given this set of findings, we conclude that it is likely that the EITC resulted in some decline in FSP participation rates, but that further study and improved data measuring EITC participation will be necessary to sort out the degree to which EITC participation affects participation in the Food Stamp Program.

VII. References

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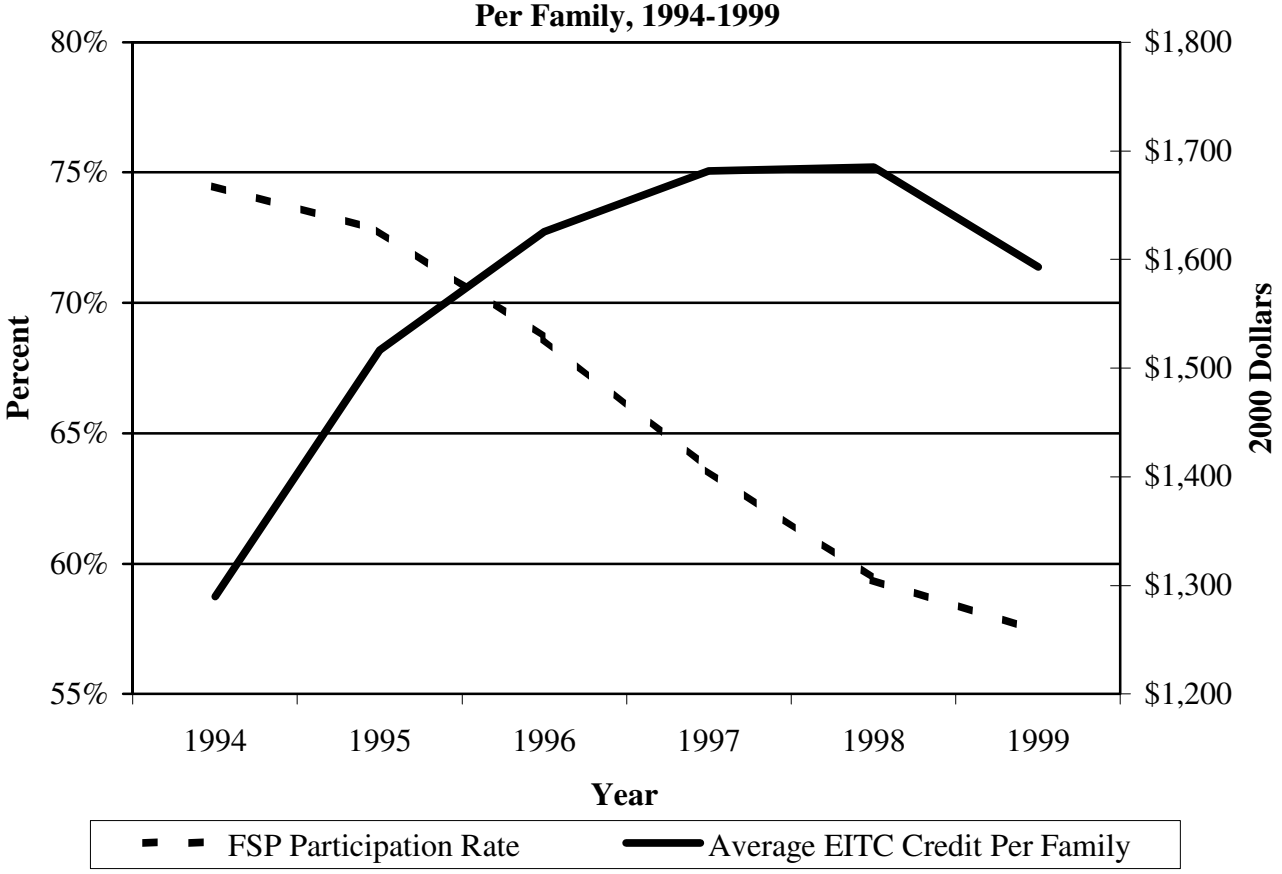
Figure 1: Overall FSP Participation Rate[1] and Average EITC Credit Per Family, 1994-1999



[1] FSP participation rate is defined as the percentage of eligibles participating in the FSP.

Sources: FSP participation rates from FSP Program Operations data, FSP Quality Control data, and March CPS data as shown in Rosso (2001); Average EITC Credit Per Family, 2000 Green Book, U.S. GPO.

Figure 2: Earned Income Tax Credit (FY1999) and Food Stamp Program Benefits (PY2001) for Households with One Adult Earner, by Size of Family, Number of Children

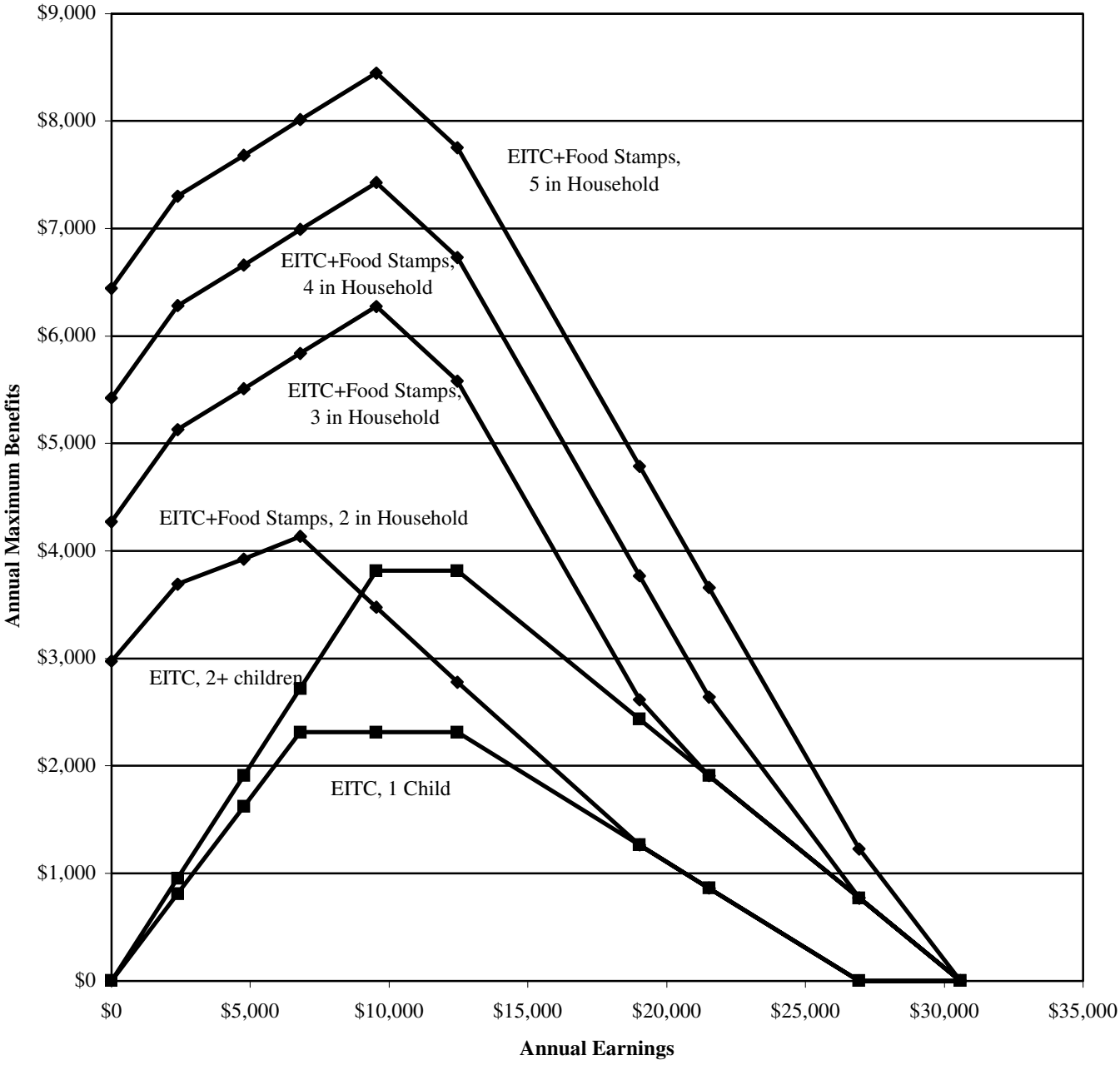


Table 1

Trends in Food Stamp Participation by Marital Status of Head of Household with Children and Employment Status: 1996-1999

	Participation in Month As % of Eligibility[1] in Month			Months of Participation Divided by Months of Eligibility
Unmarried Parent	**All**	**Not Employed in Month**	**Employed in Month**	**All**
1996	56.6	73.3	38.3	78.1
1997	51.0	68.5	34.2	48.1
1998	48.5	64.4	34.5	46.0
1999	47.2	62.2	34.1	45.5
Married Parent				
1996	19.4	32.6	11.1	24.6
1997	15.7	27.8	9.1	15.9
1998	14.0	22.2	9.7	14.1
1999	12.2	20.5	7.9	10.5

Note: The household sample for this table includes only those with children sometime in the relevant year who had incomes at or below 130 percent of the poverty line sometime during the 1996-1999 period. Food stamp eligibility is approximated as households with incomes at or below 130 percent of the poverty line in any month.

Source: Authors' tabulations of the 1996 Survey of Income and Program Participation panel data.

Table 2

Overlap Between Food Stamp Participation, Food Stamp Eligibility, and Reported EITC Claims: 1997-1999

	Households Not Eligible and Not Receiving Food Stamps in Year	Households Eligible But Not Receiving Food Stamps in Year	Households Receiving Food Stamps in Year
1997			
Refused	1.3 %	1.0 %	0.1 %
Don't Know	4.6	6.5	4.2
No Answer	60.3	57.9	65.5
Yes	9.2	14.2	21.3
No	24.7	20.4	8.9
Total	100.0	100.0	100.0
EITC Participants As % of Those Responding	27.1	41.1	70.6
1998			
Refused	1.0 %	1.3 %	0.2 %
Don't Know	5.0	6.6	4.0
No Answer	48.6	50.6	56.6
Yes	13.5	18.3	30.5
No	31.9	23.2	8.6
Total	100.0	100.0	100.0
EITC Participants As % of Those Responding	29.6	44.1	78.0
1999			
Refused	1.3 %	1.0 %	0.4 %
Don't Know	5.1	6.5	3.4
No Answer	52.2	52.3	59.0
Yes	14.0	16.5	28.8
No	27.4	23.7	8.3
Total	100.0	100.0	100.0
EITC Participants As % of Those Responding	33.9	41.0	77.6

Note: The household sample for this table includes only those with children sometime in the relevant year who had incomes at or below 130 percent of the poverty line sometime during the 1996-1999 period. Column 2 includes households eligible for food stamps in any month in the relevant year. Column 3 consists of households receiving food stamps in any month in the relevant year. Food stamp eligibility is approximated as households with incomes at or below 130 percent of the poverty line in any month.

Source: Authors' tabulations of the 1996 Survey of Income and Program Participation panel data.

Table 3

The Relationship between Actual Federal EITC Claimed and Food Stamp Program Participation at Time t

	Reduced Form			Full Form		
Explanatory Variables	**Coefficient/SE**		**% Change**	**Coefficient/SE**		**% Change**
Federal EITC Variables (Omitted: No EITC claimed)						
Actual EITC claimed $1-$999	0.824 ***	(0.152)	3.9%	0.582 ***	(0.160)	2.4%
Actual EITC claimed $1,000-$1,999	0.946 ***	(0.145)	4.7%	0.896 ***	(0.152)	4.2%
Actual EITC claimed $2,000+	1.098 ***	(0.131)	5.6%	1.120 ***	(0.143)	5.5%
State EIC Variables						
Refundable State EIC	-0.439 **	(0.197)	-1.3%	-0.540 **	(0.241)	-1.5%
Income and Asset Variables						
Total household income (in thousands)	-1.323 ***	(0.137)	-4.6%	-1.146 ***	(0.152)	-3.8%
Total household income x Total household income (in thousands)	0.022 ***	(0.001)	0.0%	0.020 ***	(0.001)	0.0%
Total household income x household size (in thousands)	0.040	(0.025)	0.0%	0.025	(0.030)	0.0%
Total household assets (in thousands)	-0.978 ***	(0.189)	-3.4%	-0.893 ***	(0.197)	-2.9%
Food Stamp Program Variables						
Electronic Benefit Transfer (EBT)	-0.073	(0.109)	-0.3%	-0.017	(0.115)	-0.1%
Welfare Program Variables						
Participation in TANF program				2.854 ***	(0.353)	32.0%
Amount of TANF benefits received (in hundreds)				0.159	(0.102)	0.5%
Presence of a state waiver program	-0.219	(0.291)	-0.7%	-0.376	(0.334)	-1.1%
TANF implemented	-0.305	(0.248)	-1.0%	-0.361	(0.299)	-1.2%
Macroeconomy						
Monthly state unemployment rate	0.046	(0.077)	0.2%	0.058	(0.083)	0.2%
Annual state employment growth rate	-0.015	(0.034)	-0.1%	-0.075 **	(0.036)	-0.2%
Employment Status Variables (Omitted: Out of the labor force)						
Employed				-0.316 **	(0.143)	-1.1%
In the labor force, unemployed				-0.169	(0.175)	-0.5%
Spousal employment				-0.667 ***	(0.203)	-1.9%
Spouse in the labor force, unemployed				0.468	(0.296)	1.9%

Table 3 (continued)

The Relationship between Actual Federal EITC Claimed and Food Stamp Program Participation at Time t

Explanatory Variables	Reduced Form Coefficient/SE		% Change	Full Form Coefficient/SE		% Change
Demographic Variables						
Household size	0.339 ***	(0.062)	1.2%	0.364 ***	(0.067)	1.2%
Female household head	1.145 ***	(0.160)	3.5%	0.978 ***	(0.156)	2.9%
Two adult household	-0.887 ***	(0.142)	-3.1%	-0.645 ***	(0.165)	-2.1%
Age	-0.014 **	(0.007)	0.0%	-0.018 **	(0.007)	-0.1%
Education (Omitted: Less than high school education)						
High school graduate	-0.315 **	(0.150)	-1.1%	-0.176	(0.156)	-0.6%
Greater than high school education	-0.438 ***	(0.156)	-1.5%	-0.254	(0.163)	-0.8%
Age of Children (Omitted: Children ages 6-17)						
Children ages 0-2	0.106	(0.099)	0.4%	-0.042	(0.106)	-0.1%
Children ages 3-5	0.219 **	(0.089)	0.8%	0.211 **	(0.095)	0.7%
Race/Ethnicity (Omitted: Non-Hispanic white)						
Non-Hispanic African American	0.249 *	(0.134)	0.9%	0.252 *	(0.143)	0.9%
Hispanic	-0.062	(0.178)	-0.2%	-0.161	(0.197)	-0.5%
Non-Hispanic other race	0.237	(0.313)	0.9%	0.093	(0.310)	0.3%
Region (Omitted: South)						
East	0.360 *	(0.186)	1.4%	0.152	(0.200)	0.5%
Midwest	0.292 *	(0.154)	1.1%	0.135	(0.163)	0.5%
West	0.041	(0.176)	0.1%	-0.276	(0.202)	-0.8%
Other Variables						
Political Affiliation of Governors (Omitted: Republican governor)						
Democrat governor	-0.302 **	(0.131)	-0.1%	-0.333 **	(0.139)	-1.1%
Independent governor	0.895 *	(0.458)	0.8%	-0.152	(0.715)	-0.5%
Reference month 1	-0.049 ***	(0.016)	0.0%	-0.051 ***	(0.019)	-0.2%
Weighted Observations (person-months)	47,988			47,988		

Notes: (1) *p < .10. **p <.05. ***p<.01.

(2) The population is low-income households heads age 18-60 with children present in the household. Low income is defined as below 130 percent of the poverty line and assets less than or equal to $2,000 (or $3,000 if at least one household member is age 60 or older). The population is further restricted to those respondents who said they did not receive EITC or those who said they did receive EITC and gave an amount.

Source: Weighted regressions of the 1996 Survey of Income and Program Participation panel data.

Table 4

The Relationship between the Seasonality of Actual Federal EITC Claimed and Food Stamp Program Program Participation at Time t

Explanatory Variables	Coefficient/SE		% Change
Federal EITC Variables			
Trimester 1 x Actual EITC claimed $1-$999	0.623 ***	(0.174)	2.7%
Trimester 2 x Actual EITC claimed $1-$999	0.631 ***	(0.181)	2.8%
Trimester 3 x Actual EITC claimed $1-$999	0.484 **	(0.196)	2.0%
Trimester 1 x Actual EITC claimed $1,000-$1,999	0.915 ***	(0.171)	4.6%
Trimester 2 x Actual EITC claimed $1,000-$1,999	0.902 ***	(0.172)	4.5%
Trimester 3 x Actual EITC claimed $1,000-$1,999	0.869 ***	(0.170)	4.2%
Trimester 1 x Actual EITC claimed $2,000+	1.149 ***	(0.151)	6.3%
Trimester 2 x Actual EITC claimed $2,000+	1.103 ***	(0.159)	5.9%
Trimester 3 x Actual EITC claimed $2,000+	1.104 ***	(0.167)	5.9%
Other Variables			
Trimester 1	-0.038	(0.087)	-0.1%
Trimester 2	-0.059	(0.067)	-0.2%
Weighted Observations (person-months)	47,988		

Notes: (1) *p < .10. **p <.05. ***p<.01.

(2) The population is low-income households heads age 18-60 with children present in the household. Low income is defined as below 130 percent of the poverty line and assets less than or equal to $2,000 (or $3,000 if at least one household member is age 60 or older). The population is further restricted to those respondents who said they did not receive EITC or those who said they did receive EITC and gave an amount.

(3) The results for the explanatory variables other than actual EITC claimed interacted with the trimester indicator variables are very similar to results reported in Table 3 and, therefore, are not repeated in Table 4.

Source: Weighted regressions of the 1996 Survey of Income and Program Participation panel data.

Table 5

The Relationship between Computed EITC Benefits a Household is Eligible for and Food Stamp Program Participation at Time t

	Reduced Form			Full Form		
Explanatory Variables	**Coefficient/SE**		**% Change**	**Coefficient/SE**		**% Change**
Federal EITC Variables (Omitted: Not EITC eligible)						
Computed EITC Eligibility $1-$999	-0.809 ***	(0.170)	-3.2%	-0.482 ***	(0.179)	-2.2%
Computed EITC Eligibility $1000-$1999	-0.922 ***	(0.147)	-3.5%	-0.522 ***	(0.147)	-2.4%
Computed EITC Eligibility $2000+	-0.613 ***	(0.094)	-2.7%	-0.130	(0.096)	-0.7%
State EIC Variables						
Refundable State EIC	-0.034	(0.122)	-0.2%	-0.206	(0.147)	-1.1%
Income and Asset Variables						
Total household income (in thousands)	-1.297 ***	(0.080)	-6.8%	-0.951 ***	(0.092)	-5.2%
Total household income x Total household income (in thousands	0.018 ***	(0.001)	0.0%	0.015 ***	(0.001)	0.0%
Total household income x household size (in thousands)	0.077 ***	(0.014)	0.0%	0.048 ***	(0.016)	0.3%
Total household assets (in thousands)	1.000 ***	(0.141)	-5.3%	-0.862 ***	(0.144)	-4.7%
Food Stamp Program Variables						
Electronic Benefit Transfer (EBT)	-0.089	(0.072)	-0.5%	0.045	(0.080)	0.2%
Welfare Program Variables						
Participation in TANF program				2.993 ***	(0.199)	44.5%
Amount of TANF benefits received (in hundreds)				0.138 ***	(0.043)	0.8%
Presence of a state waiver program	-0.154 **	(0.197)	-0.8%	-0.460 *	(0.241)	-2.1%
TANF implemented	-0.086	(0.165)	-0.5%	-0.304	(0.194)	-1.7%
Macroeconomy						
Monthly state unemployment rate	0.131 ***	(0.050)	0.7%	0.075	(0.057)	0.4%
Annual state employment growth rate	-0.008	(0.023)	0.0%	-0.054	(0.026)	-0.3%
Employment Status Variables (Omitted: Out of the labor force)						
Employed				-0.570 ***	(0.094)	-3.6%
In the labor force, unemployed				-0.279 **	(0.118)	-1.4%
Spousal employment				-0.777 ***	(0.154)	-3.6%
Spouse in the labor force, unemployed				0.046	(0.227)	0.3%

Table 5 (continued)

The Relationship between Computed EITC Benefits a Household is Eligible for and Food Stamp Program Participation at Time t

Explanatory Variables	Reduced Form Coefficient/SE		Reduced Form % Change	Full Form Coefficient/SE		Full Form % Change
Demographic Variables						
Household size	0.175 ***	(0.037)	0.9%	0.156 ***	(0.042)	0.9%
Female household head	1.099 ***	(0.111)	5.7%	0.851 ***	(0.114)	4.6%
Two adult household	-1.319 ***	(0.098)	-8.0%	-0.823 ***	(0.121)	-4.9%
Age	-0.015 ***	(0.005)	-0.1%	-0.020 ***	(0.005)	-0.1%
Education (Omitted: Less than high school education)						
High school graduate	-0.386 ***	(0.097)	-2.0%	-0.166	(0.104)	-0.9%
Greater than high school education	-0.621 ***	(0.106)	-3.1%	-0.374 ***	(0.114)	-2.0%
Age of Children (Omitted: Children ages 6-17)						
Children ages 0-2	0.081	(0.067)	0.4%	0.036	(0.073)	0.2%
Children ages 3-5	0.184 **	(0.061)	1.0%	0.183 ***	(0.069)	1.0%
Race/Ethnicity (Omitted: Non-Hispanic white)						
Non-Hispanic African American	0.391 ***	(0.098)	2.3%	0.248 **	(0.106)	1.5%
Hispanic	-0.013	(0.116)	-0.1%	-0.077	(0.128)	-0.4%
Non-Hispanic other race	0.714 ***	(0.221)	5.1%	0.467 **	(0.224)	3.1%
Region (Omitted: South)						
East	0.028 **	(0.127)	1.6%	0.007	(0.143)	0.0%
Midwest	0.298 ***	(0.114)	1.7%	0.084	(0.124)	0.5%
West	0.018	(0.124)	0.1%	-0.508 ***	(0.144)	-2.5%
Other Variables						
Political Affiliation of Governor (Omitted: Republican governor)						
Democrat governor	0.026	(0.083)	0.1%	-0.016	(0.096)	-0.1%
Independent governor	0.587 *	(0.324)	3.1%	0.299	(0.442)	1.6%
Reference month 1	-0.049 ***	(0.009)	-0.3%	-0.051 ***	(0.010)	-0.3%
Weighted Observations (person-months)	115,335			115,335		

Notes: (1) *p < .10. **p <.05. ***p<.01.

(2) The population is low-income households heads age 18-60 with children present in the household. Low income is defined as below 130 percent of the poverty line and assets less than or equal to $2,000 (or $3,000 if at least one household member is age 60 or older).

Source: Weighted regressions of the 1996 Survey of Income and Program Participation panel data.

Table 6

The Relationship between the Seasonality of EITC Benefits a Household is Eligible for and Food Stamp Program Participation at Time t

Explanatory Variables	Coefficient/SE		% Change
Federal EITC Variables			
Trimester 1 x Amount of EITC Eligible For $1-$999	-0.564 ***	(0.186)	-2.5%
Trimester 2 x Amount of EITC Eligible For $1-$999	-0.386 *	(0.203)	-1.8%
Trimester 3 x Amount of EITC Eligible For $1-$999	-0.493 **	(0.201)	-2.2%
Trimester 1 x Amount of EITC Eligible For $1,000-$1,999	-0.567 ***	(0.158)	-2.5%
Trimester 2 x Amount of EITC Eligible For $1,000-$1,999	-0.492 ***	(0.166)	-2.2%
Trimester 3 x Amount of EITC Eligible For $1,000-$1,999	-0.501 ***	(0.168)	-2.2%
Trimester 1 x Amount of EITC Eligible For $2,000+	-0.099	(0.099)	-0.5%
Trimester 2 x Amount of EITC Eligible For $2,000+	-0.132	(0.107)	-0.7%
Trimester 3 x Amount of EITC Eligible For $2,000+	-0.168	(0.111)	-0.9%
Other Variables			
Trimester 1	-0.001	(0.041)	-0.1%
Trimester 2	-0.031	(0.036)	-0.1%
Weighted Observations (person-months)	115,335		

Notes: (1) *p < .10. **p <.05. ***p<.01.

(2) The population is low-income households heads age 18-60 with children present in the household. Low income is defined as below 130 percent of the poverty line and assets less than or equal to $2,000 (or $3,000 if at least one household member is age 60 or older).

(3) The results for the explanatory variables other than actual EITC claimed interacted with the trimester indicator variables are very similar to results reported in Table 5 and, therefore, are not repeated in Table 6.

Source: Weighted regressions of the 1996 Survey of Income and Program Participation panel data.

Table 7

Changes in Food Stamp Participation within EITC Earnings Categories for 1 and 2+ Children

Change in EITC within Range for 1-2 Children	Earnings as of 1997	1996		1997		1998		1999	
		Food Stamp Participation							
		1 Child	2+ Children	1 Child	2+ Children	1 Child	2+ Children	1 Child	2+ Children
Zero Earnings	$0	62.6	72.1	50.4	63.9	47.8	63.4	51.9	60.1
EITC Increasing for 1 & 2+ Children	$1-$3500	53.8	61.4	54.4	59.2	45.9	58.6	40.7	47.7
EITC Increasing for 1 & 2+ Children	$3501-$6500	42.5	45.0	26.7	53.8	29.3	48.4	33.4	61.2
EITC Flat for 1 Child, Increasing for 2+ Children	$6501-$9140	38.2	37.6	27.9	41.4	30.3	38.7	40.1	42.9
EITC Flat for 1 & 2+ Children	$9141-$11930	12.9	36.7	19.0	25.9	17.9	36.2	29.1	34.4
EITC Decreasing for 1 & 2+ Children	$11931-$25750	13.4	20.4	11.5	22.9	9.4	15.5	8.6	17.9
EITC Decreasing for 1& 2+ Children	$25751-$29290	13.2	21.5	10.6	13.9	8.1	11.9	4.9	15.7
		Percentage Point Change in Food Stamp Participation As Earnings Increase and EITC Increases, Remains Flat, or Decreases							
From Zero to EITC Increasing for 1 & 2+ Children	From Zero to $1-$3500	-8.8	-10.7	4.0	-4.7	-2.0	-4.8	-11.2	-12.4
From EITC Increasing for 1 & 2+ Children to EITC Increasing for 1 & 2+ Children	From $1-$3500 to $3501-$6500	-11.3	-16.4	-27.6	-5.4	-16.6	-10.2	-7.3	13.5
From EITC Increasing for 1 & 2+ Children to EITC Flat for 1 Child, Increasing for 2+ Children	From $3501-$6500 to $6501-$9140	-4.3	-7.4	1.2	-12.4	1.1	-9.7	6.7	-18.3
From EITC Flat for 1 Child, Increasing for 2+ Children to EITC Flat for 1 Child and 2+ Children	From $6501-$9140 to $9141-$11930	-25.3	-0.9	-8.9	-15.5	-12.5	-2.5	-11.0	-8.5
From EITC Flat for 1 Child & 2+ Children to EITC Decreasing for 1 Child & 2+ Children	From $9141-$11930 to $11931-$25750	0.5	-16.3	-7.4	-3.0	-20.9	-23.2	-20.5	-16.5
From EITC Decreasing for 1 & 2+ Children to EITC Zero for 1 Child & EITC Decreasing for 2+	From $11931-$25750 to $25751-$29290	-0.1	1.1	-1.0	-9.0	-1.3	-3.6	-3.7	-2.2
From EITC Zero for 1 Child & EITC Decreasing for 2+ Children to EITC Zero for 1 & 2+ Children	From $25721-$29290 to $29290+	-1.8	-4.1	-0.7	2.8	10.5	2.3	15.7	2.4
From EITC Increasing for 1 & 2+ Children to EITC Flat for 1 Child, Increasing for 2+ Children	From $3501-$6500 to $6501-$9140	-4.3	-7.4	1.2	-12.4	1.1	-9.7	6.7	-18.3
Difference in change in participation rates for two children and one child case		-3.1		-13.6		-10.7		-24.9	

Notes: *p < .10. **p <.05. ***p<.01.

The household sample for this table includes only those with children sometime in the relevant year who had incomes at or below 130 percent of the poverty line sometime during the 1996-1999 period.

Source: Authors' tabulations of the 1996 Survey of Income and Program Participation panel data.

Table 8

Impact of Earnings on Months of Food Stamp Participation by EITC Earnings Segment, Controlling for Months of Food Stamp Eligibility[1] : 1997-1999

	1 Child	2+ Children
1997		
EITC Increasing for 1 and 2+ Children	-0.311 ***	-0.386 ***
EITC Flat for 1 Child and Increasing for 2+ Children	-0.452	-0.105
EITC Flat For 1 and 2+ Children	-0.211	-0.426
EITC Decreasing for 1 and 2+ Children	0.006	-0.075
Zero EITC for 1 Child and EITC Decreasing for 2+ Children	-0.006	0.023
Zero EITC for 1 and 2+ Children	-0.002	-0.001
1998		
EITC Increasing for 1 and 2+ Children	-0.576 ***	-0.123
EITC Flat for 1 Child and Increasing for 2+ Children	0.151 **	-0.592 *
EITC Flat For 1 and 2+ Children	-0.471 *	-0.396
EITC Decreasing for 1 and 2+ Children	0.003 **	-0.035 **
Zero EITC for 1 Child and EITC Decreasing for 2+ Children	-0.140	-0.089
Zero EITC for 1 and 2+ Children	-0.001	-0.001
1999		
EITC Increasing for 1 and 2+ Children	-0.360 ***	-0.485 ***
EITC Flat for 1 Child and Increasing for 2+ Children	0.249 **	0.207 ***
EITC Flat For 1 and 2+ Children	-0.513 **	-0.808 ***
EITC Decreasing for 1 and 2+ Children	-0.024 ***	-0.027 ***
Zero EITC for 1 Child and EITC Decreasing for 2+ Children	-0.029	-0.042
Zero EITC for 1 and 2+ Children	0.000	-0.001

[1] Food Stamp Program eligibility is approximated as households with incomes below 130 percent of the poverty line.

Notes: (1) *p < .10. **p <.05. ***p<.01.

(2) The cells are the sum of the spline coefficients through each segment so that they represent the change in months of food stamp participation for a $1,000 change in earnings within each segment.

Source: Spline regressions based on the 1996 SIPP panel in which months of food stamp participation are a function of months of food stamp eligibility, prior year earnings within each earnings segment, race or Hispanic origin, and education of the family head.