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.