THE EFFECT OF SAFETY NET PROGRAMS ON FOOD INSECURITY

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ABSTRACT

Does the safety net reduce food insecurity in families? In this paper we investigate how the structure of benefits for five major safety net programs – TANF, SSI, EITC, food assistance, and Medicaid"– affects low food security in families. We build a calculator for the years 2001-2009 to impute eligibility and benefits for these programs in each state, taking into account cross-program eligibility rules. To identify a causal effect of the safety net, we use simulated eligibility and benefits for a nationally representative sample as instruments for imputed eligibility and potential benefits. We also perform a two-sample instrumental variables estimation in which we use simulated benefits as instruments for actual reported benefits.   Focusing on non-immigrant, single-parent families with incomes below 300 percent of the poverty line, the results suggest that each $1000 in cash or food benefits actually received reduces the incidence of low food security by 4 percentage points. These estimates imply that moving from the policies of the 10th percentile state of Kentucky to the 90th percentile state of Vermont would reduce low food security by 1.7 percentage points on a base incidence of 33 percent. We are unable to reject equivalent impacts of cash and food assistance. The results also highlight the importance of jointly considering a full range of safety net programs.

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I. Introduction

Food security—having the resources to access enough food for a healthy and active lifestyle—is a key input into individual well-being. As of 2012, more than 1 in 7 households were defined as food insecure by the U.S. Department of Agriculture, suggesting that tens of millions of Americans face challenges in meeting their basic food needs.[1] Food insecurity is associated with a wide range of negative health and economic outcomes, making its reduction a key policy priority. Food insecurity also serves as an indicator of material hardship more broadly, so it can serve as a proxy for economic well-being in cases where other measures such as consumption are not readily available. Assessing the relationship between the safety net and food insecurity thus offers an indirect way to examine the effect of safety net programs on material hardship.

Reductions in food insecurity are a primary goal of public nutrition programs, and substantial research has investigated the effect of these programs on food insecurity among families and children. However, less is known about how *non-food* safety net programs affect food insecurity. Safety net programs may allow at-risk families to avoid or reduce food insecurity, but program effects may depend on their mix of cash- and non-cash benefits and the degree to which they "crowd out" food-specific transfers. For example, Federal food assistance tends to dampen total differences in benefits levels by considering cash assistance in the determination of Supplemental Nutrition Assistance Program (SNAP) benefits.

In addition, the safety net includes a number of different programs that interact with each other in important ways. Given that many families simultaneously receive benefits from many

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[1] http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx#.UkWSxT_qWfY

of these programs, it may be important to look at the effectiveness of the safety net in aggregate rather than separately examining the effects of each individual program. In this paper we investigate how the level of benefits received from the safety net as a whole and their distribution between cash, food, and health insurance affect low food security in families and very low food security among children.

We quantify state differences in total benefits and categories of benefits by examining eligibility and benefit levels for five means-tested sets of programs: Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), federal and state Earned Income Tax Credits (EITC), food assistance through the three largest national nutrition programs,[2] and public health insurance through Medicaid and the Children's Health Insurance Program (CHIP). Our benefits calculator reveals substantial variation across states and over time in the level and composition of benefits. Thus, two states might have similar levels of total benefits for a given family income, disability status, and family structure, but low-income residents of one state might be provided more cash while residents of another might enjoy more generous in-kind benefits. There is also substantial variation across states and within states over time in the aggregate generosity of the safety net. We exploit within-state changes over time in eligibility and benefit determination rules to identify the casual impact of program generosity.

We use 2001-2009 Current Population Survey data to investigate whether the generosity of the aggregate safety net at the state level affects food insecurity among families with children, and to understand the mechanisms underlying these relationships. We also examine whether

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[2] The three nutrition programs we consider are the Supplemental Nutrition Assistance Program, or SNAP, formerly known as the Food Stamp Program, the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and the National School Lunch Program.

these effects vary by program. We focus on families most likely to experience food insecurity: single parent families under 300 percent of the poverty line.

The results suggest that the safety net does impact food insecurity. Each $1000 in potential benefits (benefits for which a family is eligible) reduces low food security by 2 percentage points on a base rate of 33 percent, and each $1000 in benefits actually received reduces low food security by 4 percentage points. The safety net also reduces other food hardships but has no detectible impact on the measure of usual weekly food expenditures available in the data or on chronic food hardship. The results suggest that the safety net may help families manage occasional shocks that would otherwise lead to short-term reduced food consumption. Eligibility for food assistance programs reduces food insecurity to a degree that is economically and in some specifications statistically meaningful, but we find no evidence of differential effects for cash and food benefits.

II. Background and Motivation

In 2001-2009, 17 percent of non-immigrant families with children experienced low food security (LFS).[3] For single parent families under 300% of the poverty line, the corresponding percentage is 33 percent. Food insecurity emerges when households lack the resources to access enough food for an active, healthy lifestyle for all household members (Nord, Andrews, and

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[3] Authors' calculation based on Current Population Survey December 2001-2009 Food Security Supplement. We exclude immigrant families to simplify eligibility imputation, as explained below.

Carlson 2009). [4] Food insecurity is associated with nutritional outcomes for adults (Bhattacharya, Currie, and Haider 2004) and a wide range of health outcomes for adults and children (see Gundersen and Kreider 2009, and Gundersen, Kreider, and Pepper 2011, for reviews).[5]

Figure 1 shows recent trends in food insecurity for non-immigrant families with children. For both low-income single parent families and all families, the rate of food insecurity was fairly stable from 2001 until the recession starting in late 2007.   Food insecurity is almost twice as prevalent in every year among the single parent, low-income families that comprise our primary sample.

A large literature examines the impact of nutrition programs on food insecurity. Presumably due to selection into the program, SNAP recipients have rates of food insecurity that are twice as large as those of eligible non-recipients (Gundersen, Kreider, and Pepper 2011). However, a number of papers that have tried to account for self-selection of the most food insecure into food assistance find beneficial effects.   These include Gundersen and Oliveira (2001), Nord and Golla (2009), Ratcliffe, McKernan, and Zhang (2011), Mykerezi and Mills (2010), and Nord and Prell (2011), all described in Appendix A.

Comparatively little research, however, has addressed the effect of *non-food* safety net programs on food security.   Such programs are similar to nutrition programs in that they expand

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[4] See National Research Council (2006) for further discussion of the measurement of food insecurity.

[5] Additional evidence on correlates of food insecurity can be found in Kirkpatrick, McIntyre, and Potestio (2010), Eicher-Miller *et al.* (2009), Skalicky *et al.* (2006), Howard (2011), Huang, Oshima, and Kim (2010), and Cook *et al.* (2006).

the total resources available to the household and provide a buffer against income shocks. To the extent that these additional resources are used for food, they may reduce food insecurity. Borjas (2004) reports that welfare generosity decreases food insecurity among immigrants, for instance. Even non-cash programs such as public health insurance may increase the funds available for food. Understanding how household food consumption is affected by the type of safety net support (i.e. cash, food, or health insurance) is critical for the effective design of poverty policy.

Furthermore, the effect of non-food programs may depend on how they interact with nutrition programs. For example, enrollment in TANF or SSI may facilitate access to nutrition assistance programs (see Brauner and Zedlewski 1999). On the other hand, by increasing family income, state cash generosity may reduce eligibility and potential benefit levels for SNAP and other food assistance programs.[7] This dynamic can be seen in Figure 2, which shows average imputed potential cash benefits and food benefits for a fixed nationally representative low-income sample according to the policy rules for each state for a given year. It is clear that as states become more generous with their cash benefits, their residents lose potential food benefits.[8] Generous cash welfare programs could "crowd out" food assistance and in theory shift household consumption toward other items, thereby increasing food insecurity. For example, Duggan and Kearney (2007) report that households receive fewer food stamps and WIC benefits following enrollment in the Supplemental Security Income program.

Furthermore, because food assistance generosity is conditioned on income from other safety net programs, analyses of food assistance that fail to account for the generosity of other

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[7] See Ziliak, Gundersen, and Figlio (2003) for a discussion.

[8] The trade-off for a typical state is that 15-20 cents of SNAP eligibility is lost for each additional dollar of cash eligibility. Alaska and Hawaii have distinct Food Stamp/SNAP benefit rules.

safety net programs may yield biased estimates of the marginal impact of food benefits. The fact that recipients tend to participate in multiple programs is readily evident in Table 1, which shows participation rates for sample single-parent families under 300 percent of poverty. Families that report receiving cash welfare, SSI, or food assistance almost always also report Medicaid coverage. Similarly, a majority of food assistance recipient households also appear to be EITC eligible. In addition, there are important cross-program participation effects conditional on eligibility, as discussed below.

Theoretically, the net result of the "income effect" associated with non-food program participation (resulting from expanded resources) and the "substitution effect" (stemming from fewer requirements to allocate household resources to food) is ambiguous and requires empirical investigationFurthermore, even if cash and non-cash programs have similar effects, it is useful to evaluate the impact of the overall safety net package. As noted above, our research focuses on four major safety net programs in addition to food assistance: Temporary Assistance to Needy Families (TANF), Supplemental Security Income (SSI), the federal and state Earned Income Tax Credits (EITC), and Medicaid/CHIP. These are described in Appendix A.

In sum, the analysis presented below addresses the following questions: (1) What is the impact of a more generous safety net on food insecurity? (2) Does it matter whether benefits are in the form of food, cash or medical assistance? and (3) How do estimates of program effects differ from naïve specifications that only consider one program at a time? In the next section we describe the empirical approach we use to address these questions.

III. Methodology and Data

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Because the goal of this analysis is to examine how the generosity of the state safety net affects food insecurity, the general empirical approach is to regress food security on measures of family potential benefit levels and participation. We account for selection bias with one-sample and two-sample instrumental variables models described below. Our data come from the 2001-2009 Current Population Survey Food Security Supplement (CPS FSS), which is conducted in December of each year. The FSS is the source for the official food security statistics in the United States. Respondents are asked about food spending and whether they were able to meet their food needs. Based on their answers to a subset of FSS questions, households are classified as food secure or having low food security.

The unit of observation for the analysis is the family. Families are included in the sample if they include at least one child under 18 and the reference person and spouse (if relevant) are between ages 18 and 64. Families are excluded if earnings information is incomplete, if they did not complete the food security supplement, or if any member of the family is an immigrant. We exclude immigrant families throughout the analysis because program eligibility rules are different for this group and are hard to characterize without information on legal status. We primarily focus our attention on single-parent families because food insecurity rates are higher for this group, but also present results for two-parent families. We focus on families under 300 percent of the poverty level because this range captures most variation in safety net eligibility. Above 300 percent of poverty, very few families are eligible for the transfer programs we consider, but there are a number of families in the 200-300 percent of poverty range with eligibility for Medicaid and EITC.[9]

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[9] Among single-parent families in the 200-300% of poverty range, approximately 44 percent are imputed to be EITC eligible and the average fraction of kids eligible for Medicaid/CHIP is 17

Table 2 describes the summary statistics for the primary sample of interest: single parent families under 300 percent of the poverty line. This sample is more economically disadvantaged and more food insecure than the general population. Among this population, 33 percent report low food security. Nine percent of sample families have a disabled member,[10] about half have two or more children, and less than half have any college education. About 85 percent of the families are headed by a single mother rather than a single father.

We would like to impute program eligibility for each family, but the December CPS does not include detailed data on income. It contains a variable that gives total income in 16 categories, but this variable does not make a distinction between earned and unearned income, which is critical for determining eligibility and benefit levels for programs. Furthermore, this measure of total income already includes benefit income from various programs, making it a poor input to an eligibility determination procedure.

To address this issue, we use the data on *earnings* that are collected when a household is in the outgoing rotation group of the CPS (the households in month 4 or 8 of the data collection). To obtain the earnings data, we match each member of a December CPS FSS family over the age of 15 to earnings data from the appropriate month. For a quarter of the sample, the outgoing rotation group questions are asked in December, while the other three quarters of the sample are matched to data from January, February, or March. We do the matching on the basis of

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percent. Eligibility for SNAP, SSI and TANF is almost non-existent in the 200-300% of poverty income range.

[10] Disability status is reported only for those ages 15 and up.

identifiers available in the CPS data, and we check the quality of matches using reported information in both months on sex, age, and race.[11]

Once the FSS is matched to the outgoing rotation group earnings data, we use these data to determine predicted eligibility and benefit amounts for the safety net programs of interest for each family. Using program eligibility and benefit rules and parameters, we develop calculators that predict eligibility and benefit levels for TANF, SSI, Medicaid/CHIP, and food assistance programs (including SNAP, WIC, and school lunch). Food assistance programs are monetized as described in Appendix B. We do not monetize Medicaid but instead examine how the fraction of the family that is eligible relates to food insecurity.

We use the National Bureau of Economic Research's TAXSIM program to predict eligibility and benefit levels for federal and state EITCs. Inputs to the calculators include family type (married versus single parents), number of children, ages of children, earnings of respondent and spouse (where applicable), disability status of respondent and spouse (where applicable), and state and year of residence. Family groups vary depending upon the family composition rules for each specific safety net program. We assume no unearned income other than that generated by our calculators for the programs mentioned above.

In order to model the interactions between programs correctly, we use a linear process: the merged FSS data are run through the TAXSIM program to calculate federal and state EITCs,

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[11] We are able to match about 85% of families for both the reference person and spouse (applicable only in the alternative samples including married parents). Families with unmatched adults are excluded from the sample.

which are assumed to be unaffected by other benefits;[12] the output is run through the SSI calculator, which adds SSI benefits; then through the TANF calculator (since TANF eligibility and benefits are affected by SSI receipt); then through the Medicaid/CHIP calculator (since eligibility is affected by SSI and TANF receipt); then through the food assistance calculator (since eligibility and benefits are affected by both SSI and TANF). At the end of this process we have imputed potential benefits for each program; we refer to them as *potential* benefits because they are calculated assuming full take-up. Details about the assumptions underlying the programming of the calculators are provided in Appendix B.

Appendix Table 1 presents imputed eligibility rates and average potential benefit levels for our main sample: single parent families under 300 percent of poverty. Almost 90 percent of the families in the sample are imputed to be eligible for some cash or food benefits, with EITC and food assistance reaching the most families. The average annual *potential* combined cash and food package is imputed to be around $5700 (in 2005 dollars). Eighty-six percent of sample families have at least one family member imputed to be eligible for Medicaid.

Because program participation is not reported in the December CPS, we analyze the March CPS for the subsequent year to show actual participation rates and benefit levels for TANF, SSI, and Medicaid. Appendix Table 1 shows imputed potential benefits and actual benefits in the March CPS. Reported participation rates and benefit amounts are lower than imputed eligibility and potential benefits. The shortfall is due to some combination of

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[12] We assume that EITC benefits are not counted as income towards eligibility or benefits of other programs (see Appendix B).

incomplete take-up, measurement error in the imputation, and under-reporting.[13]   Including non-participants, the average sample family reports receiving $317 in TANF, $405 in SSI, and $1,258 in food assistance annually.   Adding to these an imputed $1492 in EITC benefits (EITC receipt is not observed), the average package actually received is $3473. About half of families report participating in Medicaid or food assistance, and a small minority of families participate in TANF or SSI.

Appendix Table 2 describes trends in benefits over the 2001-2009 sample period. Annual means of potential benefits are shown in Panel A and reported benefits actually received are in Panel B.   As discussed below, the increases in benefit levels observed towards the end of the sample partly reflect the weakened economy and partly reflect changes in benefit parameters.

If potential benefit levels were determined exogenously for each household, we would be interested in estimating linear probability models of the form:

$$(1) \qquad lfs_{icst} = \beta_0 + \beta_1 benefit_{icst} + X_{icst}\alpha + \theta_s + \lambda_t + u_{icst}$$

where lfs is an indicator for low food security in family i in demographic cell c in state s in year t. $Benefit$ is the level of potential benefits for the various safety net programs the family is

[13] We do not have information on assets or non-safety-net sources of unearned income, so we are likely to overstate program eligibility. Meyer, Mok, and Sullivan (2009) document significant under-reporting in the use of safety net programs. Ignoring error in imputation and reporting, we can calculate the fraction participating relative to the fraction eligible to serve as a proxy for the take-up rate. Using this approach, the take-up rates in the March CPS are estimated at 0.25 for TANF, 0.72 for SSI, 0.68 for food assistance, and 0.59 for Medicaid. We cannot observe EITC participation, so analyses throughout assume full EITC take-up. In fact, EITC has higher take-up rates than many other safety net programs (Holt 2011).

imputed to receive, *X* represents a vector of state and individual level controls, θ represents state fixed effects, and λ represents year fixed effects. Time-varying state controls include the state unemployment rate, a measure of unemployment insurance generosity, child support enforcement expenditures, and non-cash TANF generosity. We include a number of additional policy parameters in robustness checks.[14] Demographic controls include the age of youngest child, number of children (topcoded at 4) interacted with disability status, and race*education dummies.[15] Thus, the model controls for observable characteristics of families living in states in a given year, all characteristics of states that are fixed over the study period, time-varying state policy and economic conditions, and year-to-year national variation in low food security. The key coefficient β_1 represents the effect of benefit generosity on the prevalence of low food security.

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[14]We cannot impute unemployment insurance (UI) eligibility given the data limitations in the December CPS. However, we incorporate the state maximum dependent allowance as a control for UI generosity. Similarly, it is difficult to find a compelling instrument for public housing participation, so in some specifications we control for public housing/voucher units per capita. We also include the following policy parameters in robustness checks: TANF family caps, TANF strict time limits, TANF strict sanctions, TANF eligible for new non-citizens, SNAP standard utility allowance, SNAP simplified reporting, SNAP electronic benefit transfer, and SNAP combined application for SSI recipients. Details on these variables can be found in Appendix B. We tested additional policy parameters but they did not systematically predict program participation.

[15] As detailed below, we also present models with additional demographic controls.

An important challenge with estimating equation (1) is endogeneity of potential benefits. In particular, families with higher benefits are also more likely to be food insecure, for reasons that may be unobservable. We thus use the average program generosity by state, year, and demographic cell simulated for a national sample of families as an instrument for imputed eligibility. This approach is in the spirit of that used by Currie and Gruber (1996) in the context of Medicaid. Simulated generosity is correlated with benefit levels but should not be correlated with individual family shocks, conditional on the other variables. To obtain this exogenous measure of program generosity, we take the national CPS sample for 2001, strip state and year identifiers from the data, and replicate it for each state and the District of Columbia for years 2001-2009. Running these data through our series of benefit calculators allows us to examine the effects of state-level differences in program generosity while abstracting from state-level differences in population characteristics and economic environment. As documented below, states vary in the evolution of aggregate generosity of their programs as well as the composition of the safety net across food, cash, and medical insurance.

After running these simulated data through the benefit calculator, we average the predicted benefit amounts for the simulated data over a set of arguably exogenous characteristics to create the benefit level instruments. These instruments are cell means, where the cells are defined by state, year, any disabled person in family, married parents, any child<6, number of children (1, or 2 or more), highest education of parents (less than high school, high school, more than high school), and race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other). The simulated cell average benefit eligibility levels are then matched back to the CPS FSS and used as instruments for benefit eligibility among families in a given cell. We do not use earned income to define cells because labor market decisions may respond to safety net

parameters. Simulated benefit levels matched to the CPS are shown in Appendix Table 1 and annual means of simulated benefits are shown in Panel C of Appendix Table 2.[16]

In addition, the simulated benefit levels for a fixed nationally representative sample are shown in Panel D of Appendix Table 2. Because these numbers are based on a fixed sample, they offer a clear picture of how program parameters evolve over time during the sample years. The most notable change is the substantial increase in food assistance potential benefits in 2009, which is largely driven by Federal policy changes in the Food Stamp/SNAP program and, to a lesser extent, EITC generosity.[17] Other programs became slightly more generous as well, with the exception of TANF, which witnessed real benefit declines of 17 percent for a fixed sample between 2001 and 2009.[18]

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[16] The year-to-year changes in average imputed potential benefits shown in Panel A of Appendix Table 2 reflect both programmatic changes and changes in the economic circumstances of families. In Panel C, we abstract from individual economic composition by using simulated data. However, the Panel C numbers do reflect changes in the distribution of the population across demographic cells over time because the simulated benefits are matched to each family in the CPS based on demographic characteristics. Panel D of Appendix Table 2 illustrates changes for the nationally representative sample and offers a clear picture of how policy parameters evolved over the period.

[17] Bitler and Hoynes (2013) suggest that these expansions are in line with what would have been expected in a severe recession according to historical patterns.

[18] The imputed potential benefits reported in Panel A of Appendix Table 2 show increases for TANF, reflecting the fact that eligibility induced by economic hardship in the recession more

The instrumental variables strategy ensures that predicted eligibility and benefit levels vary only because of variation in state and federal policy parameters and not due to economic conditions or population characteristics in a state. For example, a rich state with generous policy parameters might have a low *imputed* eligibility rate for a program because few of its residents are poor enough to qualify for a program, but it would have a high *simulated* eligibility rate because a large portion of a national sample would qualify. Because we control for state fixed effects and year fixed effects, we rely on within-state differences in the policy parameters to identify the effects of program participation on food insecurity.[19]

Figures 3-8 illustrate the policy variation over time on which we rely, shown here for twelve large states. These figures represent average potential benefits for the March 2001 fixed simulated sample run through the policy parameters in each state and year. The variation shown in these graphs is due strictly to state variation in policy parameters; using the fixed sample abstracts from the impacts of demographic and economic changes within states.

Though there are common national trends, it is clear that state patterns in generosity differed substantially over the 2001-2009 period. For example, the combined real cash and food benefit package rose by almost 13 percent in Virginia and only 1 percent in California (Figure 3). Similarly, TANF benefits fell by 27 percent in real terms in Pennsylvania but only fell 8 percent

than offset the changes in policy parameters reflected in Panel D that made the program less generous for a given income level.

[19] In addition to within-state variation over time, some variation may also come from differential impact of demographic cell membership across states. For example, the benefit generosity for disabled versus non-disabled residents may be larger in some states than others, and this difference would not be fully accounted for by the state fixed effect or the disability control.

in Illinois (Figure 4). States also vary over time in the existence and level of state supplements for SSI (Figure 5) and EITC (Figure 6), and the degree to which they expanded or contracted Medicaid eligibility (Figure 8).

The approach described thus far is well suited to understanding the relationship between the potential benefits for a family and food insecurity. However, because the imputation is imperfect and because take-up is incomplete, the actual benefits received may be substantially different from the imputed potential benefits. Therefore, we perform an additional analysis in which we use simulated potential benefit levels as instruments for actual reported benefit levels rather than for imputed eligibility.[20]

Using actual reported benefits rather than imputed potential benefits would be a straightforward exercise if actual benefit amounts were reported in the December CPS. Because they are not, we must turn to the March CPS and use a two-sample instrumental variables approach. Specifically, we use the simulated benefit levels derived using the March sample to predict actual reported benefit levels in the March Current Population Survey and use the parameters to generate out-of-sample predictions of actual benefits in the December CPS. We then regress low food security on the predicted actual benefit levels using the December CPS

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[20] It is well known that a substantial fraction of eligible individuals fail to enroll in safety net programs. Take-up rates are determined in part by program parameters; for this reason we have explored a wide range of control variables related to program characteristics. Take-up also varies over time and we do not explore such variation here. Ganong and Liebman (2013) provide a comprehensive exploration of SNAP take-up. Further reviews of the take-up literature are available in Remler and Glied (2003) and Currie (2004).

sample to create two-sample instrumental variables estimates. We report cluster bootstrapped standard errors generated using 2000 replications.

In sum, an overview of the empirical approach is as follows:

1. Create a five-program eligibility and potential benefit calculator that incorporates cross-program eligibility effects for each state and year 2001-2009 and adjusts for inflation.

2. Take a nationally representative low-income sample from the December 2001 CPS and subject the entire sample to the calculator for each state and year adjusting for inflation. For each family in the sample find *Imputed Real Potential Benefits* for each state and year. Find the average imputed real potential benefit level for each demographic cell in the national sample for each state and year; these averages are the *Simulated Real Potential Benefits* defined by cell-state-year.

3. Take the actual December CPS samples and subject them to the calculator. For each family in the sample find *Imputed Real Potential Benefits.*

4. Merge the *Simulated Real Potential Benefits* into the December CPS samples by cell, state, and year.

5. Perform a one-sample IV regression examining Low Food Security where *Simulated Real Potential Benefits* serve as instruments for *Imputed Real Potential Benefits.* (First stage reported in Table 3, second stage reported in Table 4).

6. Repeat Steps #2-#4 for the March CPS.

7. Combine the March and December samples. Perform a two-sample IV regression examining Low Food Security where *Simulated Real Potential Benefits* are used to predict *Actual Reported Real Benefits* in the March CPS data and to make an out-of-sample prediction in the December CPS data. These predicted actual benefits are then used as a right hand side variable in a low food security regression using the December CPS. (First stage reported in Table 5, second stage reported in Table 6).

8. Repeat Step #7 2000 times to bootstrap standard errors.

In the end, we use the one-sample IV to estimate the impact of program potential benefits and eligibility on food insecurity, and we use the two-sample IV to estimate the impact of program actual benefits and participation. The results of both analyses are reported in the next section.

IV. Results and Discussion

A. One Sample Regressions

Table 3 presents results from the first stage of the one-sample regressions (using the December CPS only), and it shows that the first stage prediction is indeed sufficiently strong to apply an instrumental variables strategy. In all cases, simulated potential benefit levels for a particular program are strongly and positively related to imputed potential benefit levels. Furthermore, in all cases the instruments are jointly significant with F-statistics above 35.

It is important to note, however, that there are a number of cross-program effects. In other words, exogenously determined benefits for one safety net program may be positively or negatively correlated with imputed potential benefits in another. For example, state-years with higher simulated Medicaid eligibility have lower imputed TANF and SSI benefits, after controlling for simulated benefit levels for the cash programs. Though a full discussion of cross-program effects is beyond the scope of this paper, these findings highlight the importance of *jointly* considering programs when assessing the effectiveness of the safety net.

Table 4 presents the main results from the one-sample analysis. For comparison, the first column presents results from an OLS regression. The OLS results demonstrate that eligibility for safety net programs is *positively* related to low food security for low-income single parent families. This result is unsurprising, since more economically disadvantaged families within this population are both more likely to qualify for social safety net programs and more likely to be food insecure.

To address the selection problem and isolate the causal impact of program generosity on food insecurity, we turn to the instrumental variables strategy described above. The IV strategy purges the estimates of bias stemming from the fact that a family's economic circumstances are

correlated both with program eligibility and food insecurity. The key finding, shown in column II of Table 4, is that the safety net does matter. Raising a family's combined potential cash and food package by $1000 reduces LFS by 2.0 percentage points, on a base of 33 percent. Moving from the 10th percentile state (Kentucky, with a mean potential benefit package of $4698 for the simulated sample) to the 90th percentile state (Vermont, with a package of $6961) would increase predicted imputed benefits by about $1018 and reduce low food security by 2.1 percentage points.[21] The estimated coefficient on Medicaid eligibility is also negative, but the standard error is large and the coefficient is not statistically different from zero.

Column III investigates the marginal effect of individual programs. Point estimates on each of the cash and food programs are negative. SSI and food assistance have statistically significant effects: each $1000 in SSI (food) potential benefits reduces low food security by 3.2 (1.8) percentage points. The EITC has a similarly sized point estimate but is not statistically significant. The Medicaid coefficient is positive and insignificant.

Column IV of Table 4 shows the effect of all cash programs combined, food programs combined, and Medicaid/CHIP. All three coefficients lie between -0.010 and -0.025; the coefficients on cash and food are statistically significant. Given the similar magnitudes of the cash and food coefficients and the lack of statistical difference between them, it is not possible to reject the hypothesis that cash and food have equivalent impacts. This finding is consistent with evidence from Hoynes and Schazenbach (2009) that food stamps are treated like cash by recipients.

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[21] This calculation uses the fact that each dollar of simulated cash and food benefits is associated with a 52-cent increase in imputed benefits, as shown in column I of Table 3.

This point is echoed in the subsequent columns, which include combined cash and food benefits as well as each program one at a time. The coefficients on individual programs in columns V through VIII represent the extra effect of cash and food benefits from one program over and above their contribution to the total benefit package. The coefficients are indistinguishable from zero after controlling for the total cash and food benefit level. Though there may be small differences in program efficacy that we cannot detect, we can reject large differential program effects. In short, the aggregate safety net matters, but the exact form of benefits appears to be less important for food insecurity.

B. Two Sample Regressions

We now turn to our two-sample analysis. Using actual reported benefits levels allows us to assess the effect of actual benefits received rather than potential benefits. Table 5 presents results from the first stage, which shows that in the March CPS, simulated potential benefits for a program predict actual reported benefits for that same program.[22] The estimated coefficients are lower than those reported in Table 3, in part due to incomplete take-up of transfer programs. F-tests show that the instruments are strong for cash and food programs, but in columns II and V models predicting Medicaid participation the F statistic is below 10. The results for the Medicaid program (insignificant throughout) therefore should be interpreted with caution.

Table 6 reports our main results from the two-sample analysis. Results are broadly consistent with those reported in Table 4 for the one-sample analysis, but the estimates have larger standard errors. The point estimate of β_1 implies that actual receipt of a $1000 cash and

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[22] EITC is treated differently in the analysis. Since EITC amounts are not reported in the March CPS, we again regress imputed EITC benefits on simulated potential EITC benefits.

food package reduces LFS by 4 percentage points. These estimates imply that moving from the 10th percentile state of Kentucky to the 90th percentile state of Vermont would increase actual benefits by about $432 and reduce low food security by 1.7 percentage points, a very similar estimated impact as in the one-sample analysis.[23]

Another way to gauge the magnitude of the coefficient is to consider the expansion of the safety net during the recession. Between 2007 and 2009, the average combined cash and food package actually received increased by $628 in the single-parent sample. Most of this increase was associated with Federal expansions in the SNAP and EITC programs.[24] At the same time, food insecurity rose over the period by 6.9 percentage points in the sample, from 29.0 to 35.9. The estimates suggest that without the safety net expansion, the 2009 rate of food insecurity would have been 1.1 percentage points higher than it was, with 37 percent of low-income single-parent families experiencing low food security.

Columns II through VII of Table 6 show results for separate programs, but we do not have enough power to identify differences across programs. As in the one-sample analysis, coefficients on Medicaid have large standard errors, and the weak first stage makes it difficult to draw any conclusions about the effects of public health insurance on food security.

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[23] This calculation is based on the fact that each dollar in simulated benefits is associated with 19 cents in actual benefits received, as shown in Table 5.

[24] In the fixed simulated sample, the package of potential benefits increased by $561 over the two year period, including a $394 increase in food assistance and $151 increase in the EITC.

C. Additional Analyses

In Table 7, we explore alternative markers of food consumption over the twelve months prior to the survey. Results from both one-sample and two-sample analyses suggest that a stronger safety net significantly reduces both measures of food-related anxiety and actual food deprivation. A more generous cash and food package significantly reduces the probability a family reports they that they need more money to meet their food needs or that they have run short of money for food. It also significantly reduces the likelihood that they ever cut the size of meals or skipped meals because there was not enough money for food; that they ever ate less; or that sometimes often their food did not last. Interestingly, however, the safety net does not increase usual food expenditures (see columns I and II). One possible explanation for this pattern of results is that safety net benefits help families manage occasional shocks that would otherwise lead to temporarily reduced food consumption.[25]

We motivated our analysis by discussing the importance of looking at the safety net as a whole, given high levels of multiple program participation. In Table 8, we provide some evidence on the importance of looking at the whole safety net by examining each individual program one at a time, to get a sense of how results differ in a 'naïve' analysis that does not take into account the interactions between the programs. In the one sample analysis, the results are similarly signed when we consider programs individually or together, except for the case of

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[25] This interpretation is supported by further analysis (not shown) of how frequently respondents ate less than they thought they should or cut the size of their meals – almost every month, some months, or only one or two months. The safety net appears to contribute to the largest reduction in the "some months" category and has no significant impact on chronic food insecurity occurring almost every month.

Medicaid. However, TANF, SSI and food assistance have point estimates of larger magnitude when other programs are not considered simultaneously. This finding is consistent with the evidence shown in Table 1; participants in any one of these three programs are more likely than others to participate in the other two as well. Considering TANF, SSI, or food assistance alone may overstate the effectiveness of the individual program.

On the other hand, the EITC coefficient is closer to zero when other programs are not considered. This is consistent with the fact that EITC recipients are *less* likely to participate in cash and food transfer programs than other sample families, so the marginal benefit of the EITC program is potentially understated in a naïve specification.

Though we cannot establish a statistical difference between our preferred estimates (column I of Table 8) and those derived from the naïve specifications (columns II through VI), the pattern of results highlights the importance of considering multiple programs. These findings are echoed in the two-sample version of the naïve specification, though lack of statistical power makes some coefficients difficult to interpret.

The evidence from Table 5 (the first stage in the two sample analysis) also suggests that exogenous eligibility in any one of the safety net programs is correlated with participation in other programs that may also influence food insecurity. This finding serves as a reminder to poverty researchers that even exogenously induced eligibility for a single program may generate impacts on the outcome of interest by raising or lowering participation in other programs.

Appendix Table 3 presents a limited set of results for alternative samples - married and single-parent families who are below 300%, 200%, and 100% of the poverty line. The estimates suggest no measurable impact of the safety net for married families. One explanation for this is

the comparatively low rate of food insecurity for this group.[26] It may be the case that two-parent families are better able to weather temporary economic shocks without a safety net. The food security of single-parent families does appear to benefit from safety net receipt throughout the low to moderate range of the income distribution.

Appendix Table 4 shows that the results are robust to a number of alternate specifications.   Column I duplicates our baseline results, which used a minimal set of control variables (from Column III of Table 4). Column II adds a more detailed set of individual level controls, including the age of the respondent, whether the parent is male or female, age of the youngest child interacted with disability status, and race-education cell interacted with disability status. These controls make little difference and are excluded from the baseline specification to improve power in the two-sample analysis. Column III adds a set of controls detailing parameters of the TANF, SNAP, and public housing programs in each state.[27] Column IV includes both the individual controls and policy parameters. Column V of Appendix Table 4 controls for whether family income is below 100% or 200% of the poverty line. The key coefficient remains stable throughout.

Column VI investigates the impact of excluding 2009 in the analysis. This was a year of recession and dramatic but uneven expansion of the food stamp program, and is a source of important variation.   The coefficient excluding 2009 is about one-third smaller but retains statistical significance. Column VII excludes three states that are unusual in terms of their policy

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[26] The rate of low food security is 10-13 percentage points lower for married families in each income category.

[27] The parameters are listed in Table 2.

parameters or population – Alaska, Hawaii, and District of Columbia. The results are not substantively changed.

The final two columns of Appendix Table 4 show the results from two placebo tests. The instruments for safety net generosity predict neither employment nor income. These findings offer confidence that the results are not driven by a spurious correlation between local economic conditions and safety net generosity. In addition, these regressions indicate that the impact of the safety net on food insecurity is not operating through changes in labor supply.[28]

VI. Conclusion

Participation in a range of safety net programs is an important means by which low-income families may respond to the risk of food insecurity. The analysis presented here estimates the effect of major cash, food, and medical safety net programs on food insecurity. We find evidence that a generous cash and food safety net does reduce low food security in families with children.   The evidence on the effect of public health insurance is inconclusive.

Our findings suggest that each $1000 in cash or food benefits for which families are eligible reduces low food security by 2 percentage points, and that each $1000 actually received reduces low food security by 4 percentage points. These estimates imply that moving from the policies of the 10th percentile state of Kentucky to those of the 90th percentile state of Vermont would reduce low food security by 1.7-2.1 percentage points on a base incidence of 33 percent. Without expansions in the SNAP program during the Great Recession, the rate of low food security would have risen by 8.0 percentage points rather than the 6.9 percentage point increase

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[28] It is conceivable that the employment of a single parent could increase chaos in the home and disrupt the meal schedule, for example, but that does not seem to be the mechanism here.

actually observed. The safety net also reduces the probability that a family reports other food-related hardships.

The safety net has no detectible impact on typical family food expenditures as measured in the Current Population Survey Food Security Supplement. It does, however, appear to reduce the likelihood of occasionally running short of money for food by providing a buffer against shocks. In sum, providing a safety net so that families have a source of support – either cash or food – during hard times can substantially improve food security.

Although states differ widely in the composition of their safety net packages, we find no evidence of a significant difference in the effectiveness of food versus cash programs – the total generosity of the package appears to be what matters. Under current rules, states lose Federal food assistance dollars when they expand their cash safety net. Though their budgets may suffer, the results presented here suggest that states need not worry that food insecurity will rise as a result.

The analysis here also highlights an important methodological issue facing poverty researchers. Low-income families often participate in multiple safety net programs. Analyses that focus only on one program risk overstating or understating its impact on the outcome of interest. Even when program participation arises exogenously, secondary effects on eligibility for or participation in other programs need to be considered.

Finally, the analysis highlights the role that the safety net can have in improving the material well-being of Americans. Reductions in food insecurity, a key indicator of material well-being, should be one of the benefits considered when evaluating policy changes to safety net programs. With poverty rates as traditionally measured continuing at relatively high levels

by recent historical standards, understanding the role of the safety net in alleviating hardship is essential. Our results demonstrate the importance of the safety net in furthering this goal.

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Appendix A. Appendix Describing Individual Safety Net Programs

TANF.   The Temporary Assistance to Needy Families (TANF) program (formerly Aid to Families with Dependent Children, AFDC) provides cash assistance to very low-income families with children who either have a single parent or (more rarely) an unemployed parent. The cash assistance program provides a state-set level of benefits, which is reduced as the parent earns other income. This basic structure began to be modified by states under waivers of the federal rules in the mid-1990s in order to encourage greater connection to the labor force among recipient parents. The waiver period was followed by the enactment of welfare reform in 1996, which established TANF in place of the entitlement program AFDC, giving states considerably more freedom in designing and implementing their programs. Importantly for this project, eligibility for TANF confers automatic eligibility for SNAP, and the design of SNAP offsets to some extent the variation in state maximum benefits. Thus there is less variation in the combined maximum TANF/SNAP benefit across states than there is in the maximum TANF benefit alone, although SNAP benefits do not entirely eliminate differences (Currie, 2003).

As described above, despite the extensive literature on the effect of food programs on food sufficiency, there are surprisingly few papers focusing on the marginal impact of cash welfare on food security. Borjas (2004) finds evidence of such a relationship using variation induced by state responses to welfare reform to identify the effect. Similarly, studies of "welfare leavers" following the implementation of TANF show some evidence that families leaving welfare experienced food hardships after exiting (see Acs, Loprest, and Roberts, 2001, for a summary). Winship and Jencks (2004) find no evidence that welfare reform aggravated food-related problems among single mothers or their children between 1995 and 2002. By focusing

on general trends, however, they are largely picking up effects of economic growth and stagnation, rather than on effects of cash assistance *per se*.

Papers examining the effect of cash assistance on consumption are also informative for our analysis. Meyer and Sullivan (2004) find improvements in consumption of single mother families relative to comparison families following welfare reform. Gruber (2000) examines how the maximum cash assistance benefit level in a state affects consumption of families where a woman becomes a single mother through divorce. He finds that raising the state maximum benefit level by one dollar raises the level of food and housing consumption by 28 cents.

SSI. The Supplemental Security Income Program (SSI) is a federally funded program that provides income support to disabled individuals with limited financial resources.[29] The SSI-disabled program has been expanding dramatically over time, with the number of adult recipients growing 89% between 1990 and 2010, and the number of child recipients quadrupling over this same time period. Some of this increase is likely due to movements of individuals from AFDC/TANF to SSI in the aftermath of welfare reform (General Accounting Office, 1997; Wamhoff and Wiseman, 2007). Individuals cannot enroll in both TANF and SSI, though many families have members participating in both programs.

There has been very little research examining the effects of SSI on either general well-being or food security, despite evidence that suggests that the disabled have high levels of overall material hardship and food insecurity (She and Livermore, 2007; Parish, Rose, and Andrews

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[29] The SSI program also provides means-tested income support to the elderly, but that is beyond the focus of this paper.

2009; Huang, Guo, and Kim 2010).[30] Duggan and Kearney (2007) find that enrollment of a child on the SSI program increases family income and reduces the likelihood of poverty. Coleman-Jensen and Nord (2013) find that disability income recipients are more likely to be food insecure than other disabled individuals, but note that this likely reflects differences in the severity of their disabilities. However, Schmidt and Danziger (2012) analyze a sample of former welfare recipients and find that disability benefit recipients are significantly more likely than unsuccessful applicants to report food insufficiency, even after controlling for detailed health conditions, activity limitations, and individual fixed effects.

Though SSI benefits are set at the federal level, a number of states provide additional optional supplements. In 2010, 21 states provided SSI supplements that ranged in maximum dollar amounts from $1 to $362. These supplement amounts also vary over time, both in nominal and in real terms. Higher state supplements have been shown to be associated with the share of children on SSI (e.g., Garrett and Glied, 2000).

EITC. The federal Earned Income Tax Credit (EITC) is a refundable credit administered through the tax system for low-income families with earned income. It has grown rapidly since its creation, from $5.0 billion (2009$) in 1975 to $60.4 billion in 2009 (Tax Policy Center, 2012), in part due to a series of expansions to the credit in the 1980s and 1990s (Hotz and Scholz, 2003). The EITC differs in several important ways from the other programs considered in this project. First, it is targeted at families with workers. Second, because it is administered through the tax system, most EITC recipients receive their credit in a lump sum in February or

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[30] For example, She and Livermore (2007) find that of the poor and near-poor individuals in the SIPP who experienced hunger, 62% reported a disability.

March, rather than spread throughout the year. Research that examines how recipients spend their credit focuses on the one-time nature of the cash transfer. Using the Consumer Expenditure Survey, Barrow and McGranahan (2000) find that EITC-eligible households spend 9% more on durable goods in February than do similar households that are not eligible for the credit. Smeeding, Ross Phillips, and O'Connor (2000) surveyed low-income households in Chicago that filed tax returns about their plans for using their EITC. While 75% of those receiving credits reported plans to use at least part of their credit for "social mobility" uses, 69% reported that they would use part of their EITC to make ends meet. 23% of those receiving credits said they would use part of it on food.

EITC benefits are set at the federal level, but a number of states (24 plus the District of Columbia in 2001) have their own EITCs (Williams, Johnson, and Shure, 2010). The state-level EITCs tend to be a percentage of the federal credit ranging from 3.5% to 50% in 2010. Five states have enacted new EITCs since 2006, and a number of states have recently increased their EITC subsidies. Neumark and Wascher (2001) find large effects of the state EITCs on income and income-to-needs ratios.

Food Assistance. The Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp program) is the largest Federal nutrition program. Because eligibility for SNAP is not linked to family structure, it serves an important function as a safety net for disadvantaged individuals who lack access to other programs. SNAP assistance is provided in the form of an electronic benefit transfer card, which can be used to purchase non-prepared food items from stores.

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is aimed at meeting nutritional need for children under five years of age, as well as pregnant, post-partum, and nursing women. WIC recipients receive vouchers for particular food items; the exact items provided are determined locally subject to Federal nutritional guidelines.

The National School Lunch Program provides free or reduced cost meals children in school. Children are eligible if their family meets a means test or if the school has a sufficiently high fraction of low-income students.

A large literature examines the relationship between food assistance and food insecurity. Gundersen and Oliveira (2001) use an instrumental variables technique and find that SNAP participants do not face higher rates of food insecurity after controlling for selection. Nord and Golla (2009) use the Current Population Survey Food Security Supplement linked across years to trace out dynamic patterns of very low food security relative to SNAP entry. They find that food security appears to deteriorate in the 6-8 months prior to entering SNAP, but that after SNAP receipt begins, the likelihood of very low food security (VLFS) declines by about one third within a month or so. Ratcliffe, McKernan, and Zhang (2011) use recent state-level changes in SNAP rules to instrument for SNAP participation, and also find that SNAP reduces LFS and VLFS. Mykerezi and Mills (2010) use state administrative error rates and self-reported loss of benefits while still eligible in an instrumental variables framework and find that participation in SNAP lowers rates of food insecurity. Nord and Prell (2011) find that the temporary increase in SNAP benefits in the economic stimulus package of 2009 reduced food insecurity among SNAP-eligible families relative to non-eligible families. Herman *et al.* (2004) show that food insecurity is reduced when families enter the WIC program. Gundersen, Kreider, and Pepper (2012) show that the school lunch program improves food security.

A related literature examines the effects of food programs on food consumption. Theory predicts that food programs raise the quality and quantity of food consumed in a household in two ways: by increasing the total resources available to the household and by shifting the allocation of household resources towards food. Gundersen and Ziliak (2003) find that due to SNAP, food consumption is significantly less volatile than income. A number of papers have found that the marginal propensity to consume food out of a dollar of food stamps is higher than that out of a dollar of cash income (e.g. Fraker 1990; Breunig and Dasgupta 2002; Fraker, Martini, and Ohls 1995; Fraker *et al*. 1995). Using the diffused introduction of the Food Stamp Program across counties, Hoynes and Schanzenbach (2009) estimate that the marginal propensity to consume food out of a dollar of food stamps is comparable to that out of a dollar of income.

Medicaid/CHIP. These programs provide health insurance for children and some parents in low-income families. Although originally linked tightly to eligibility for AFDC or SSI, eligibility limits have steadily risen since the mid-1980s, allowing children in families with incomes as high as 200 percent of the federal poverty line or higher to be eligible for public insurance. This expansion of eligibility means that roughly a third of all children are income-eligible for Medicaid and about half of all children are income-eligible for Medicaid or CHIP (Dubay, Haley, and Kennedy, 2002). The income limits for eligibility vary substantially across states and, following seminal work by Currie and Gruber (1996), exogenous state variation in eligibility is typically captured by a variable measuring the fraction of a national sample that would be eligible under the rules in effect in each state.

Access to public health insurance may affect the likelihood of a child experiencing food insecurity in two ways: first, families who receive public insurance for their children do not have

to pay the premium cost to cover their children, and second, Medicaid and CHIP have little to no cost-sharing. For both reasons, eligibility for public health insurance frees up resources for the family to use for other expenditures, including food. While there has been no research specifically investigating the effect of Medicaid/CHIP on food insecurity, there have been several papers studying consumption impacts of public health insurance. Gruber and Yelowitz (1999) report an approximately $538 increase in annual consumption associated with Medicaid participation. More recently, Leininger, Levy, and Schanzenbach (2010) find that eligibility for Medicaid/CHIP is associated with an increase in consumption, although their results suggest that most of the increase is allocated to consumption of transportation or saving for retirement. Other work supporting a relationship between public insurance eligibility and consumption potential includes Shaefer, Grogan and Pollack (2011) and Banthin and Selden (2003). Thus, there is scope for even a non-cash program like Medicaid to affect food consumption and food insecurity.

Appendix B. Data Appendix

I. Benefits Calculator

Our benefits calculator first reads in the raw December CPS data for 2001-2009. It then reads in the Outgoing Rotation Group (ORG) files for January-March of each year, and matches the December data to the appropriate ORG. We then form appropriate family groups in the December data corresponding to the family composition rules for each safety net program to be modeled. Families are defined as one or two parents or step-parents ages 18-64 and their minor children (where the definition of "minor" varies by program); extended family members and unmarried partners are not included in the family.

The resulting data are then run through the National Bureau of Economic Research's TAXSIM calculator to calculate federal and state Earned Income Tax Credits. Output from TAXSIM is run through the SSI calculator, and output from the SSI calculator is then run through the TANF calculator. The output from the TANF calculator, combined with data on children, is run through the Medicaid/CHIP calculator, and finally, the output from the Medicaid/CHIP calculator is run through the food assistance calculator. We provide details on each of these steps below.

<u>Matching of December CPS to Outgoing Rotation Groups</u>

The December CPS lacks adequate information on earnings for this analysis. The income variable conflates earned and unearned income and, importantly, already includes any safety net benefits. For the program calculators, we need to obtain earned income from the CPS outgoing rotation group (ORG) sample. For participants in the December CPS, the ORG is split between December, January, February, and March CPS surveys. Thus, roughly three-quarters of the

sample require using CPS identifiers to match individuals across survey months. Matches are excluded if there are implausible race, age, or gender differences. The match may fail because of identifier error, because a family moves, or because an individual exits the family. Furthermore, a successful match may yield incomplete earnings information, most often because an individual is self-employed. Overall, about 85% of families successfully match with complete earnings information.

TAXSIM

We use the National Bureau of Economic Research's TAXSIM Version 9 program (http://www.nber.org/taxsim) with the Stata ado interface to calculate federal and state Earned Income Tax Credits (variables v29 and v35, respectively). Our sample is defined to include only families with children, so we have no single taxpayers. We assume that all married CPS respondents file as married and that all single parents file as heads of household. The number of dependents for tax purposes includes all children under the age of 19, as well as disabled and full-time students between the ages of 19 and 23. For more information on TAXSIM, see Feenberg and Coutts (1993).

Transfer income (TANF, SNAP, SSI) is not counted as income towards EITC eligibility or benefits. In most states, the EITC is not counted as income for eligibility/benefit calculations of other transfer programs.[31] In a number of states, the EITC is counted as a resource after a period of time if the credit is not spent.[32]

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[31] Two exceptions exist: In Connecticut (all years 2001-2010), the EITC is counted as earned income for TANF purposes in the month it is received. In Florida (from 2006-2010), the EITC is not counted for TANF eligibility, but it is counted as a lump sum in the month it is received for

We assume no unemployment compensation, and assume that all types of income used in tax calculations (other than own earnings and spousal earnings) are zero. This includes dividend income, other property income, taxable pensions, and gross social security benefits. We also assume that rent paid and real estate taxes paid are zero, as well as child care expenses and other itemized deductions such as state and local taxes and deductible medical expenses. We assume no capital gains and losses. There is a TAXSIM variable for "Other non-taxable transfer Income such as welfare, and child support that would affect eligibility for state property tax rebates but would not be taxable at the federal level." We enter this as zero since it does not affect EITC calculations.

SSI Calculator

We assume that respondent families are eligible for SSI if the respondent or spouse (or both) reports a work-limiting disability and if their countable income makes them financially eligible for SSI.[33] We ignore child SSI because reliable data on disability among children is not

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benefit calculation. We are currently ignoring EITC income in our TANF calculations for these states.

[32] In no state is EITC counted as an asset in the month it is received. It is counted as an asset in the month after receipt in only one state. Most states that do count remaining portions as an asset do so in the 2nd or 3rd month after receipt.

[33] There are a number of issues associated with using self-reported disability measures to estimate eligibility for SSI. Some individuals who report work-limiting disabilities may not have disabilities severe enough to pass the Social Security Administration's five-step process for determining qualifying disabilities. Some individuals who are SSI recipients (and therefore have

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available in the dataset. This means we are potentially underestimating the effect of SSI on the well-being of families with children (Duggan and Kearney, 2007).

We assume no unearned income in our calculations of SSI eligibility and benefits. As such, we are overstating eligibility benefits for households who are receiving OASDI or Unemployment Insurance income.

Individuals are eligible for SSI if their countable income is less than the federal benefit rate, and the benefit level is the difference between the two. In calculating countable income, there is a $20 general income exclusion. The first $65 of earned income is excluded, then 1/2 of earnings over $65. These exclusion amounts were constant in nominal terms throughout the 2000s. Married couples are subject to the same $20/$65 income exclusions as an individual regardless of whether they both have income.

Federal SSI benefit rates for couples and individuals are collected from the *Social Security Bulletin's Annual Statistical Supplement*, various years. State supplement levels for couples and individuals are collected from the 2004 *Green Book*, and *State Assistance Programs for SSI Recipients*, various years. In states with a SSI supplement, it is the federal benefit rate plus the supplement that is used as the point of reference in determining eligibility and payment amounts (Trenkamp and Wiseman 2007).

For couples where one spouse is eligible and one is ineligible, if the ineligible spouse's income is less than or equal to the difference between the couple federal benefit rate and the individual federal benefit rate, then there is no deeming of spousal income, so we calculate SSI benefits as if the eligible spouse is an individual. If the ineligible spouse's income is greater than

made it through this process) may not report work-limiting disabilities. See Burkhauser *et al*. 2002 and Burkhauser, Houtenville, and Tennant 2012 for further discussion.

the difference between the couple federal benefit rate and the individual federal benefit rate, then deeming of spousal income applies. We then calculate countable income as a couple, and subtract from the couple federal benefit rate (Balkus and Wilschke 2003).

TANF Calculator

Our measure of net income for TANF eligibility and benefit calculation only includes earned income of family members. SSI recipients are not eligible for TANF, and it is generally more advantageous to enroll in SSI if possible. We exclude SSI income for SSI recipients in family when determining TANF benefits for other members of the family (Golden and Hawkins, 2012). We ignore all other types of income, including Unemployment Insurance.

The size of the TANF unit varies by state. Information obtained on inclusion in the unit is from the Welfare Rules Database at the Urban Institute. For most states, this includes children under age 18, with children 18 years old included if they are full-time students. SSI recipients are not included in the TANF unit.

All TANF eligibility and benefit parameters (gross and net income and earnings thresholds, need standards, maximum payments, and earned income disregards) are collected from the Urban Institute's Welfare Rules Database. Earned income disregards differ in many states for eligibility versus benefits. For eligibility disregards, we use the rules that apply to new applicants, and ignore disregards based on earnings history. For benefit disregards, we use the rules that apply to someone who has been on the program 12 months (+one day), who is continuously employed for 6 months (+ one day), and is working 25 hours/week. We ignore disregards for child care expenses in our calculator. For states with no explicit income thresholds, we assume that the need standard is used as the threshold. We calculate income

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eligibility for TANF based on whether the family meets any gross or net earned or unearned income thresholds set by the state. We also account for the statutory eligibility of two-parent non-disabled families set by states. For families that we determine to be TANF-eligible, we then use the benefit computation formula with parameters from the WRD to determine benefit levels.

Medicaid/CHIP Calculator

We first impute Medicaid eligibility for adults in the household. Eligibility thresholds as a percent of the poverty line for working and non-working adults vary by state. Unit size for Medicaid includes all children under the age of 19 (except in Minnesota, which includes all children ages 20 and under). Earnings include those of both spouses and all children considered to be in the Medicaid unit.

Adults are eligible for Medicaid if they are working and family income as a percent of the poverty line is below the working cutoff; or if they are not working and family income as a percent of the poverty line is below the non-working cutoff, or if they are on SSI. We thus impute Medicaid eligibility for adults in the household by comparing earned income as a percent of the federal poverty level to the eligibility threshold. Eligibility thresholds vary by state, by year, and by whether the adult is working or not. The Medicaid family unit that is used to determine earnings and the appropriate poverty threshold includes all adults and children under the age of 19 (except in Minnesota, which includes all children ages 20 and under) who are not SSI recipients.

Children are eligible for Medicaid (or CHIP) if the income of their Medicaid family unit is below their state-specific, age-specific, and year-specific cutoff. Again, SSI recipients are not included in the family unit, nor is their income counted. Information on eligibility thresholds for both children and adults was obtained primarily from the Kaiser Commission on Medicaid and the Uninsured, which conducted a periodic 50-state survey of Medicaid and CHIP eligibility rules over the 2000-2010 period. Additional information on eligibility thresholds was obtained from previous work by Shore-Sheppard (2008) and Hamersma and Kim (2009).

Food Assistance Calculator

The food assistance calculator considers three Federal programs – SNAP, WIC, and the National School Lunch program. The smaller school breakfast program and other nutrition programs are not included.

SNAP eligibility is based on a gross income screen (130% of the poverty line) and a net income screen (100% of the poverty line). Gross income includes earned income, imputed SSI benefits, and imputed TANF benefits. Net income is equal to gross income, less 20 percent of earned income, less a standard deduction.

The SNAP unit includes all members of the family, including TANF and SSI recipients, except in California, where SSI recipients and their income are excluded. The SNAP unit includes children 21 years of age and younger regardless of their work/school status, (2004 Green Book; Food and Nutritional Act of 2008), so our earned income measure includes earnings of all children up to and including 21 year olds. Families where all members are either TANF or SSI recipients are categorically eligible.

In California, the SNAP benefit for SSI recipients is "cashed out" in the state supplement. SSI recipients living independently in CA are ineligible for SNAP. Benefits for other households that include SSI recipients are calculated without including the SSI recipient in the budget unit or counting the SSI recipient's income in assessing household resources (Trenkamp and Wiseman, 2007).

All relevant parameters (gross and net income screen values, standard deductions, and maximum benefits) are collected from the Food and Nutrition Service at the United States Department of Agriculture. Most parameters vary by family size. Eligibility and benefit parameters are the same for all states in the continental US but different for Alaska and Hawaii.

The SNAP benefit for families that pass the gross and net income screens are equal to the SNAP maximum benefit less 30% of net income. It is possible for the imputed benefit to be negative, even for eligible families. The minimum benefit level for families of 1 and 2 persons is $10 in early years. The Food, Conservation, and Energy Act of 2008 changes the minimum benefit for 1 and 2 person families to be equal to 8% of the maximum SNAP allotment for a one person household. This means it now differs in Alaska and Hawaii from the continental US, and changes by year. There is no minimum benefit level for families of 3+ persons.

For the school lunch imputation, the unit size for eligibility determination is calculated by the number of children 21 and younger in the household plus one for a single parent or two for a married parent. Income includes SSI and TANF income. Income limits are 130% of poverty for free lunch and 185% of poverty for reduced cost lunch. SNAP and TANF eligibility imply free lunch eligibility.

To impute the value of a free lunch, we use the maximum value per lunch that the federal government reimburses the states for lunch provision.[34] The contiguous states have a fixed rate; higher rates apply in Alaska and Hawaii. Rates vary by year. Reduced lunch reimbursement rates are 40 cents lower under the assumption that schools will charge students 40 cents for these lunches.

To determine the number of lunches per year, we assume there are 180 school days except in states where laws as of March 2013 set minimum required days at a level different than 180.[35] In those cases we use the current state minimum number of days as the number of school lunches; we do not consider historical variation in school year length. To impute the total annual value of the program to a family, we multiply the dollar value of annual lunches by the number of children ages 5 through 17 in households that are income eligible.

The income eligibility threshold for WIC is 185% of the federal poverty line. TANF and SNAP eligibility imply WIC income eligibility. Families with pregnant, postpartum, or nursing women or children under 5 are eligible. WIC food packages vary by whether the mother is pregnant, postpartum, or nursing, and by the age of the children. Packages also vary the local level subject to Federal nutrition guidelines.

To impute a value for WIC, we use the national average annual WIC food costs per person.[36] We apply these imputed values to all children under five in a WIC-eligible household.

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[34] These are published annually in the federal register and can be found on the USDA website: http://www.fns.usda.gov/cnd/Governance/notices/naps/naps.htm.

[35] School year lengths can be found at the Educational Commission of the States, http://www.ecs.org/html/Document.asp?chouseid=10668.

[36] The USDA publishes these costs by year: http://www.fns.usda.gov/pd/wisummary.htm

We do not explicitly add the value for maternal WIC. However, the food packages for nursing mothers combined with the minimal food package for a nursing infant may approximate the USDA average. Non-nursing mothers are eligible for the program for six months and their children receive formula, suggesting our imputation is likely understated in families with formula-fed newborns.

II. Additional Policy and Control Variables

State unemployment rate: Collected from the Bureau of Labor Statistics Local Area Unemployment Statistics.

Unemployment Insurance weeks: The average number of UI weeks available over the 12-month period to which the CPS Food Screener pertains. We received data from Henry Farber and Rob Valletta on the number of extended weeks of UI available, beyond the normal 26. We then calculated the average total number of UI weeks (extended weeks + 26) available by state over the 12 months from December – November before the December Food Security Supplement survey is conducted.

Unemployment Insurance dependent allowances: Maximum dependent allowances in dollars come from the US Department of Labor Employment and Training Administration (http://www.ows.doleta.gov/unemploy/statelaws.asp). Yearly data reflects the status of state law enacted as of January 1 of that year.

TANF generous asset limit: Equals 1 if state had an asset limit greater than $3000 or had no asset limit. TANF asset limits in dollars collected from the Urban Institute's Welfare Rules Database.

TANF family cap: Equals 1 if a state had a family cap in place that denied additional benefits or reduced benefit amounts to a family that had additional children while on public assistance. Data through 2005 obtained from Rebecca Blank and Jordan Matsudaira, updated with information from the Urban Institute Welfare Rules Database.

TANF strict time limit: Equals 1 if a state had a lifetime time limit of less than 60 months. Data through 2007 obtained from Rebecca Blank and Jordan Matsudaira, updated with information from the Urban Institute Welfare Rules Database.

SNAP standard utility allowance for a family of 3: We use the dollar amount of the HCSUA, which is the standard utility allowance including heating and cooling. Data for 2005-2010 collected from SNAP Quality Control data generated by Mathematica, F Tables. Data are for fiscal years.   http://hostm142.mathematica-mpr.com/fns/download.htm. Monthly data for 2001-2004 were provided by Katie Fitzpatrick, and were averaged to generate annual data. We used averages for Alaska and New York, where SUA depends upon location within the state.

Child support enforcement dollars per capita: Total administrative expenditures on child support were collected from HHS Office of Child Support Enforcement Annual Reports to Congress. 2005-2009 values from 2009 Annual Report to Congress, Table 43; 2001-2004 values from 2004 Annual Report to Congress, Table 30.

Public Housing Units and Vouchers Per Capita: Data on the number of subsidized housing units by state is available from HUD for years 2000 and 2004-2009. Linear interpolation is used for 2001 through 2003 data years.

 (http://www.huduser.org/portal/datasets/assthsg.html).

Figure 1. Low Food Security in Sample Families

Note: Authors' calculations based on December CPS. Sample excludes immigrant families.

Fraction Families with Low Food Security (y-axis)

Year (x-axis)

All Families — Single Parent Families <300% Poverty
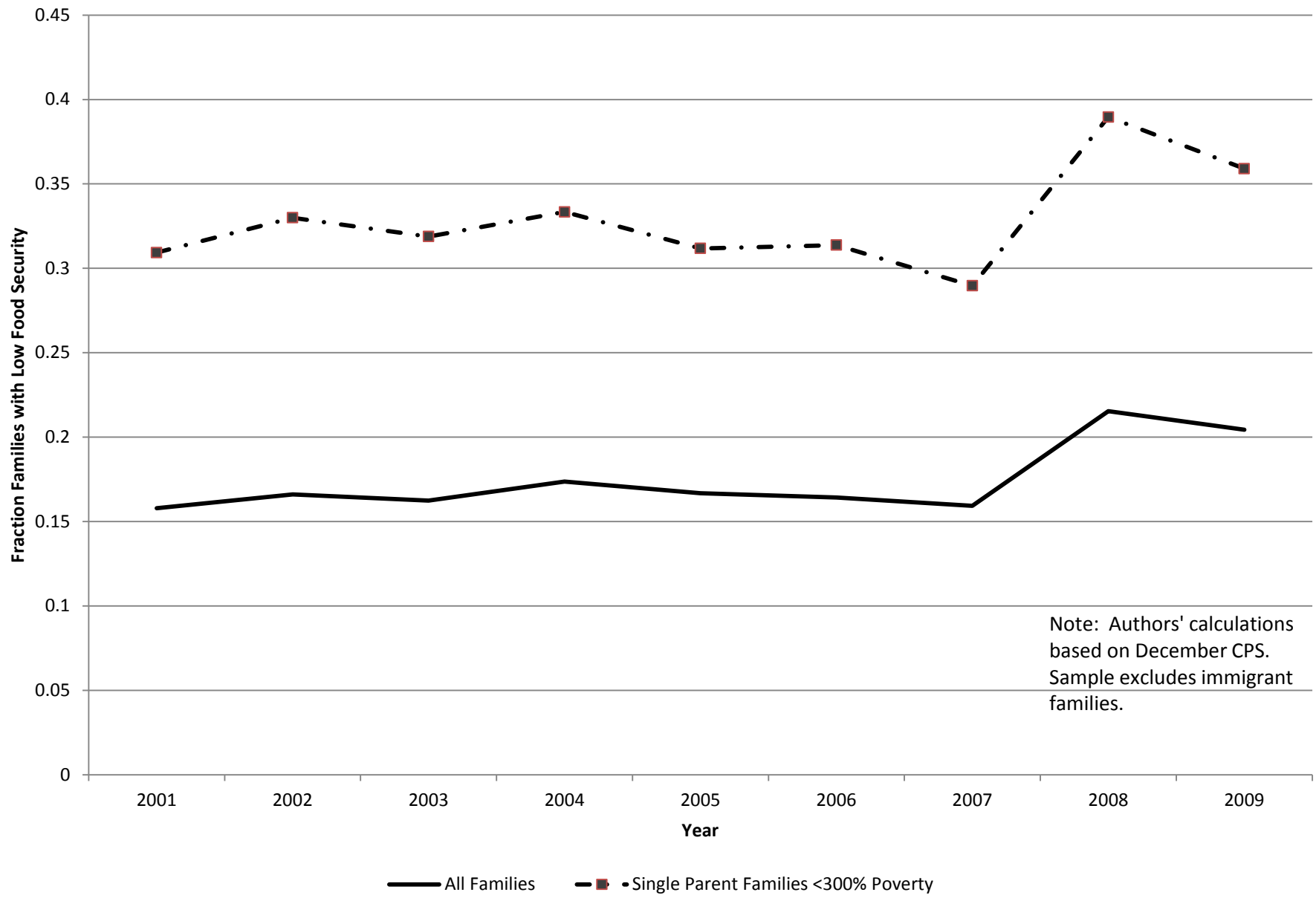
Figure 2. Cash vs. Food Imputed Potential Benefits For Representative Sample Using 2001 Policies
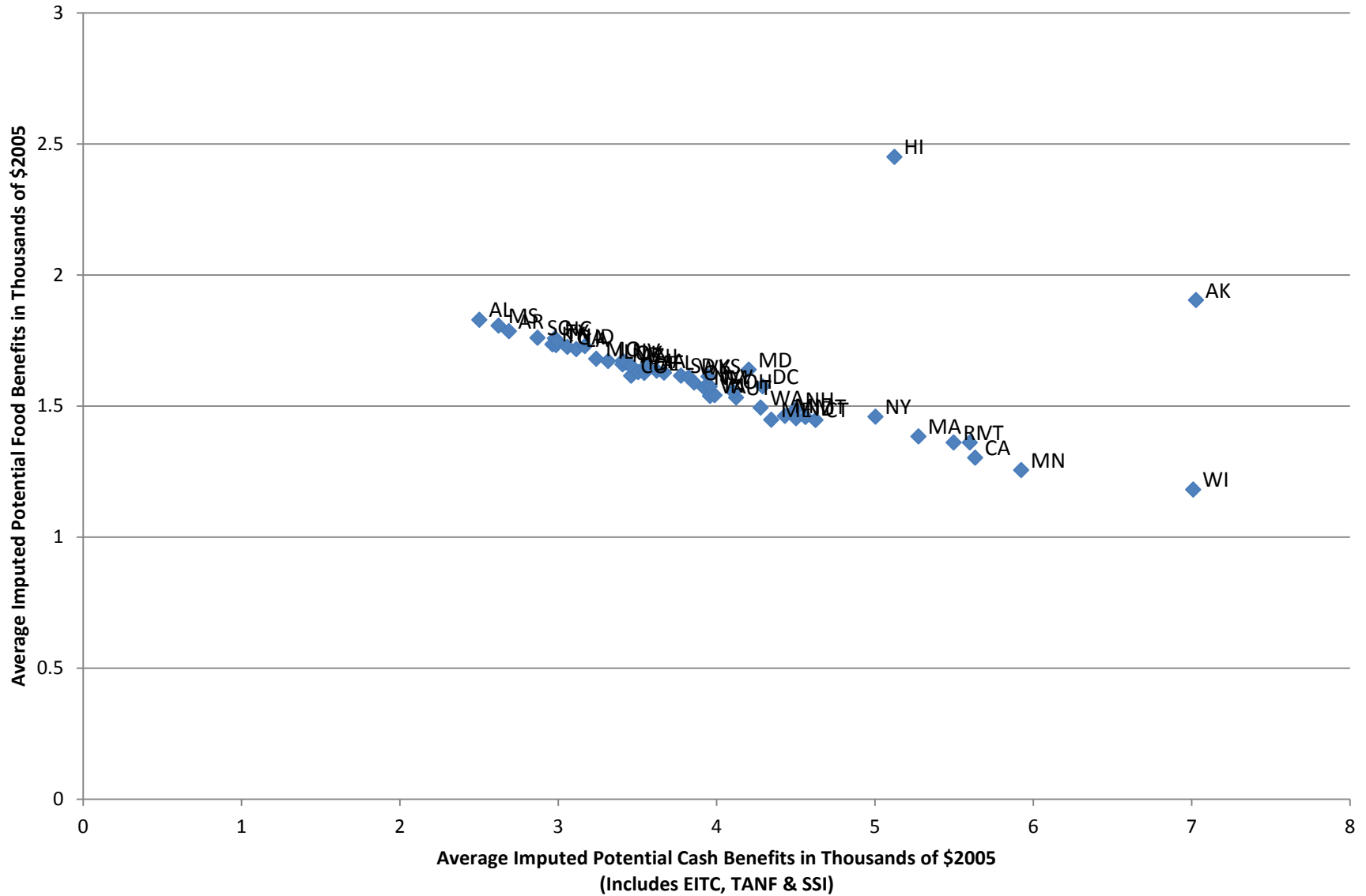
Figure 3. Average Real Combined Potential Cash and Food Benefits Relative to 2001 Fixed Simulated National Sample Twelve Largest States
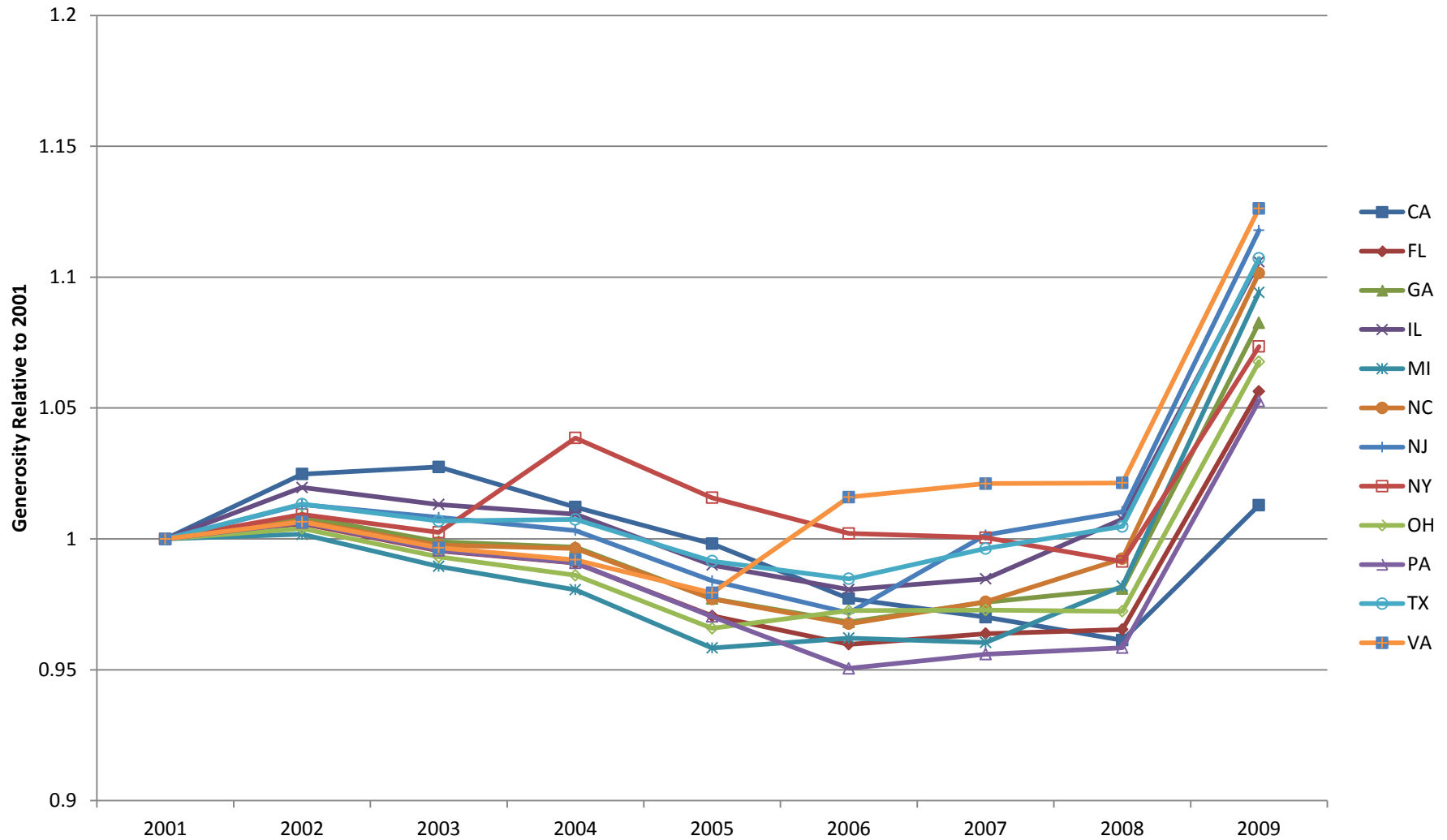
Figure 4. Average Real Potential TANF Benefits Relative to 2001 Fixed Simulated National Sample Twelve Largest States
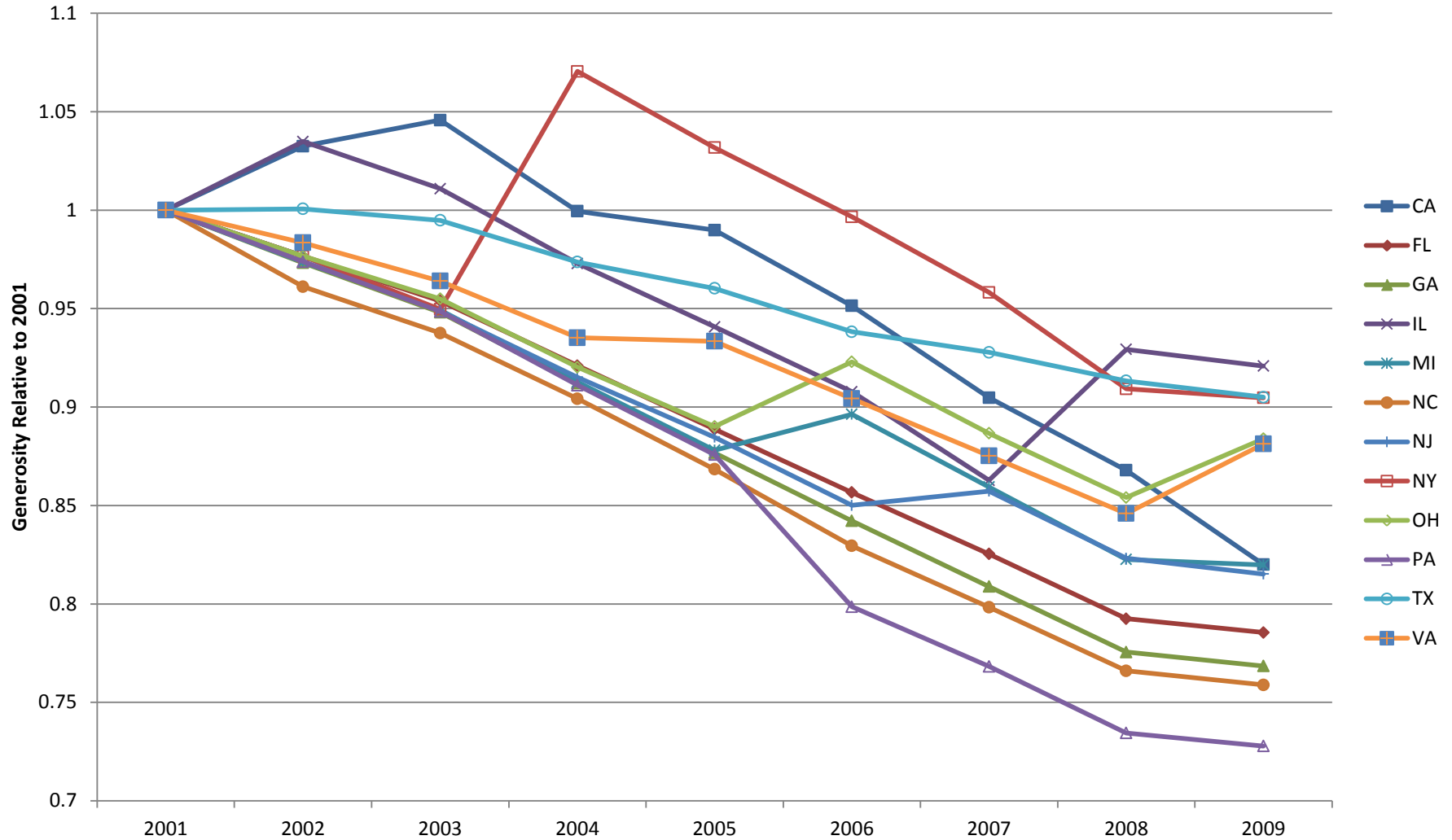
Figure 5. Average Real Potential SSI Benefits Relative to 2001 Fixed Simulated National Sample Twelve Largest States
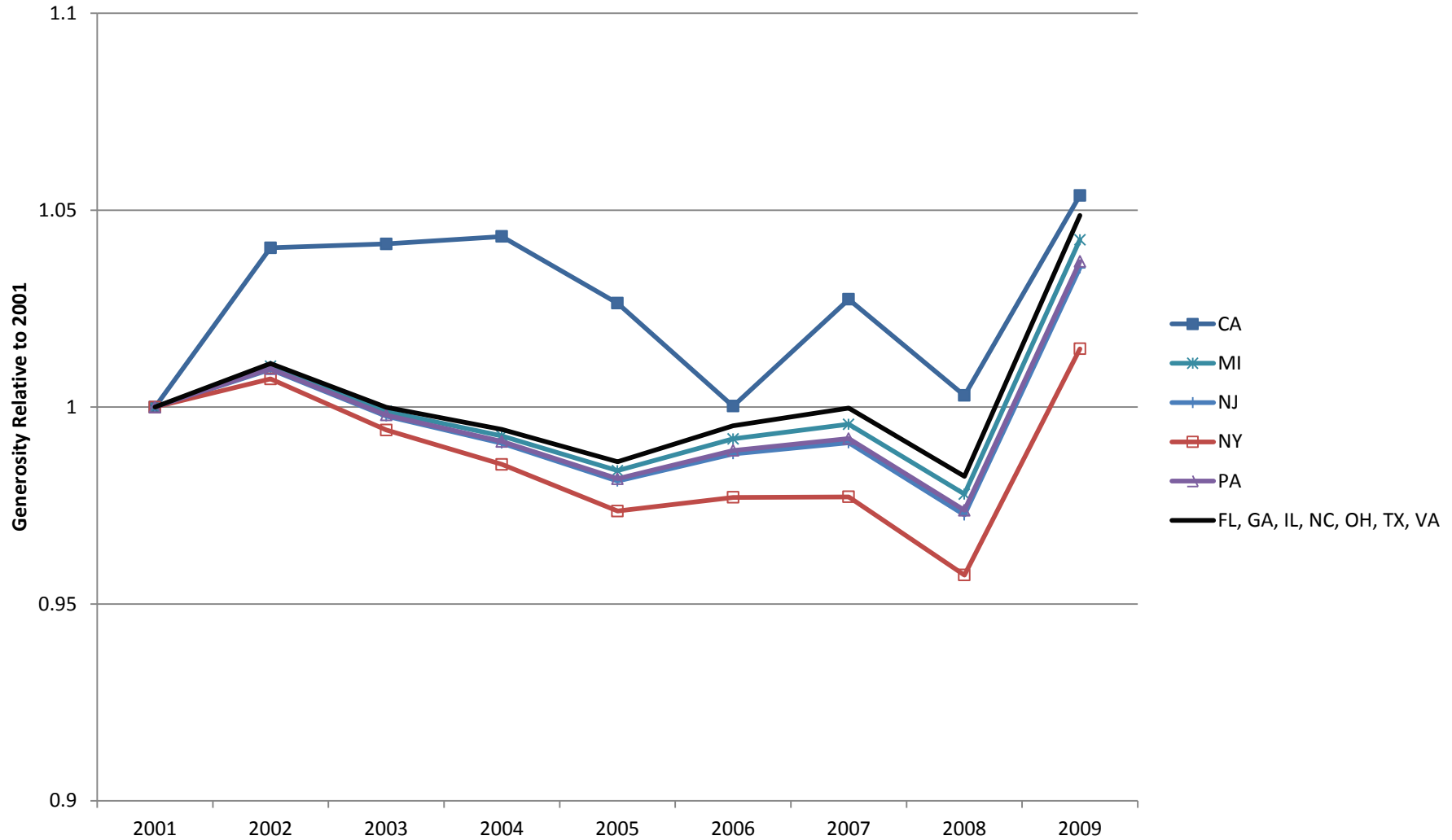
Figure 6. Average Real Potential EITC Benefits Relative to 2001 Fixed Simulated National Sample Twelve Largest States
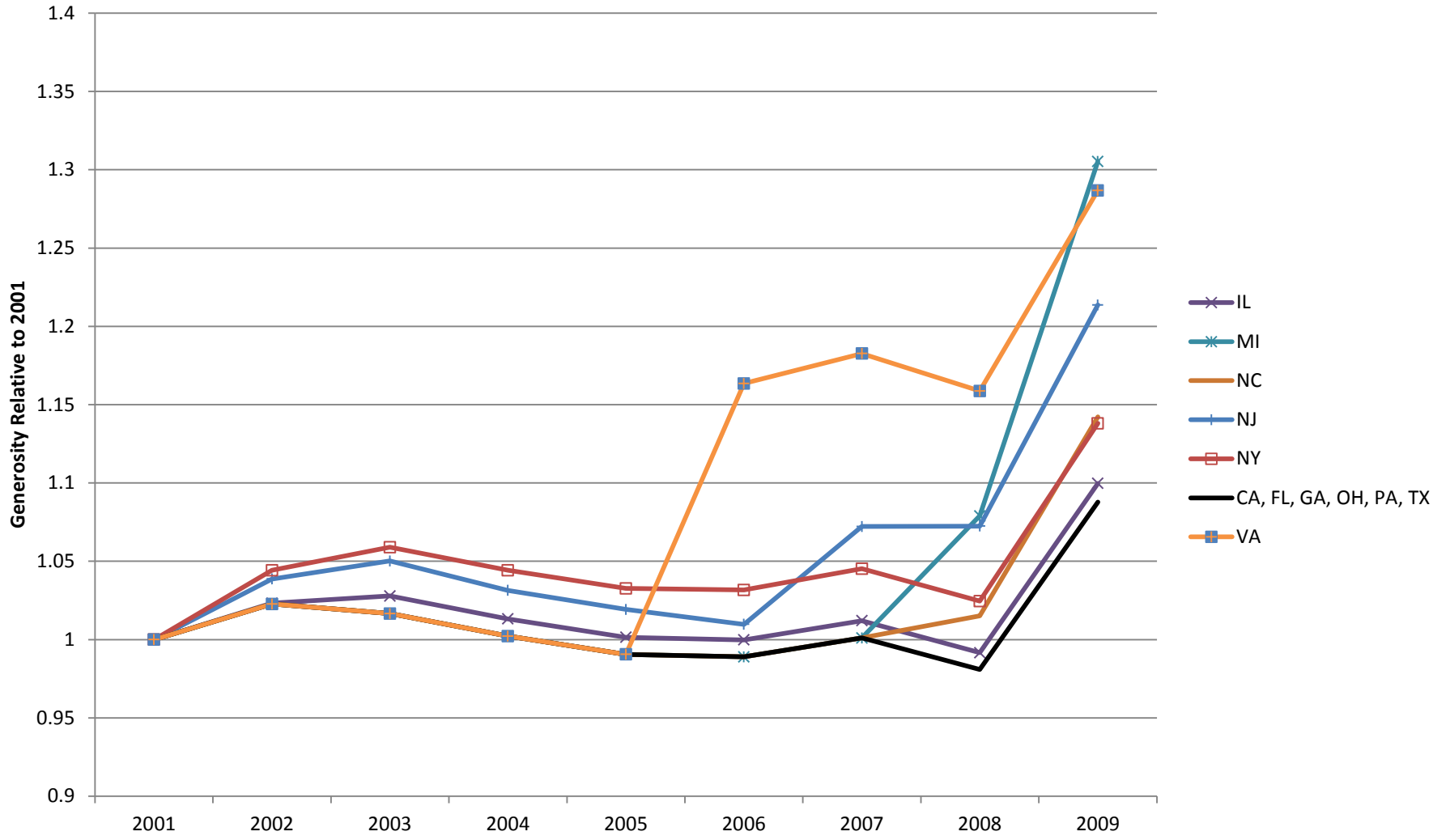
Figure 7. Average Real Potential Food Benefits
Relative to 2001
Fixed Simulated National Sample
Twelve Largest States
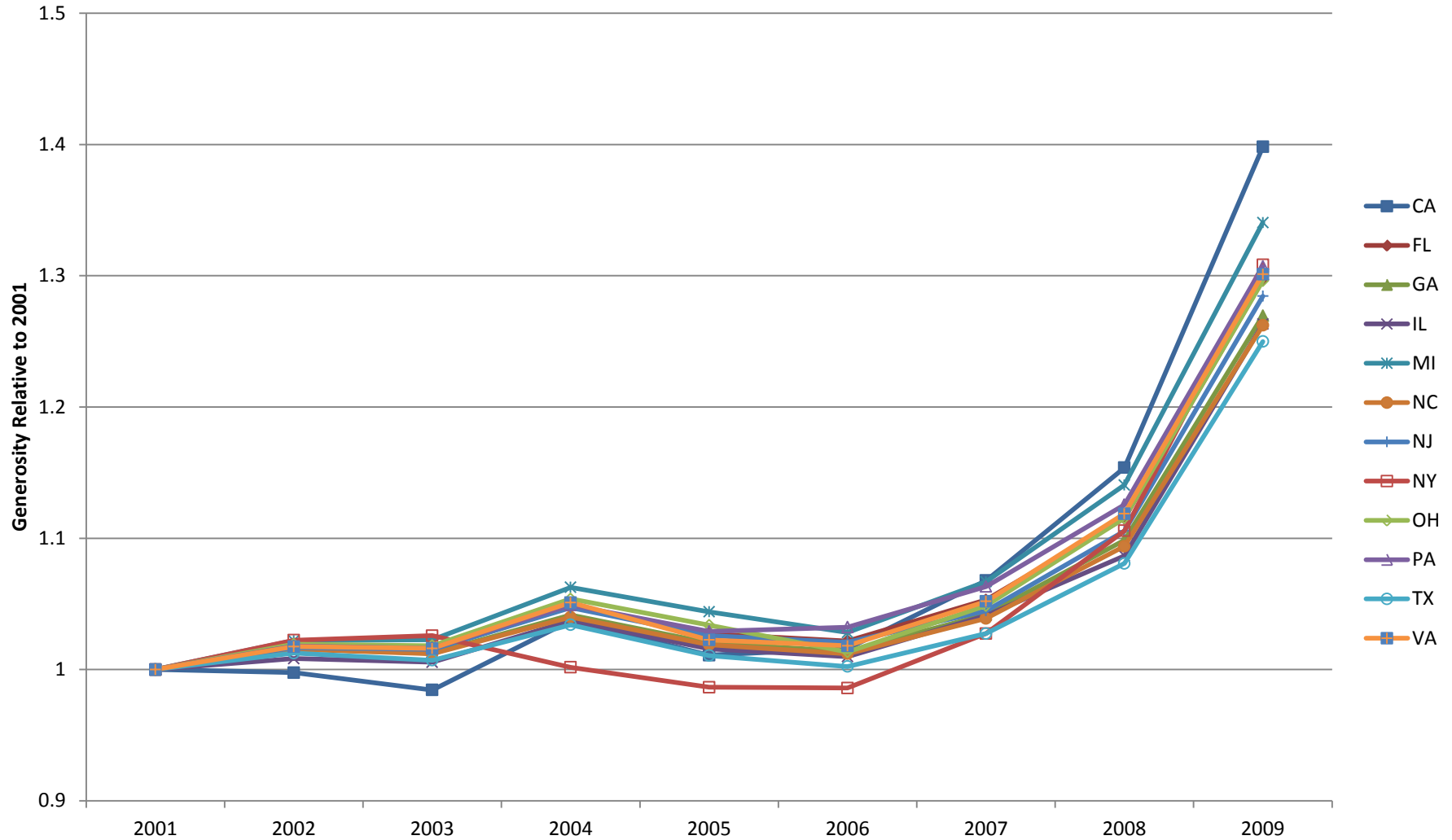
Figure 8. Average Fraction Medicaid Eligible
Relative to 2001
Fixed Simulated National Sample
Twelve Largest States
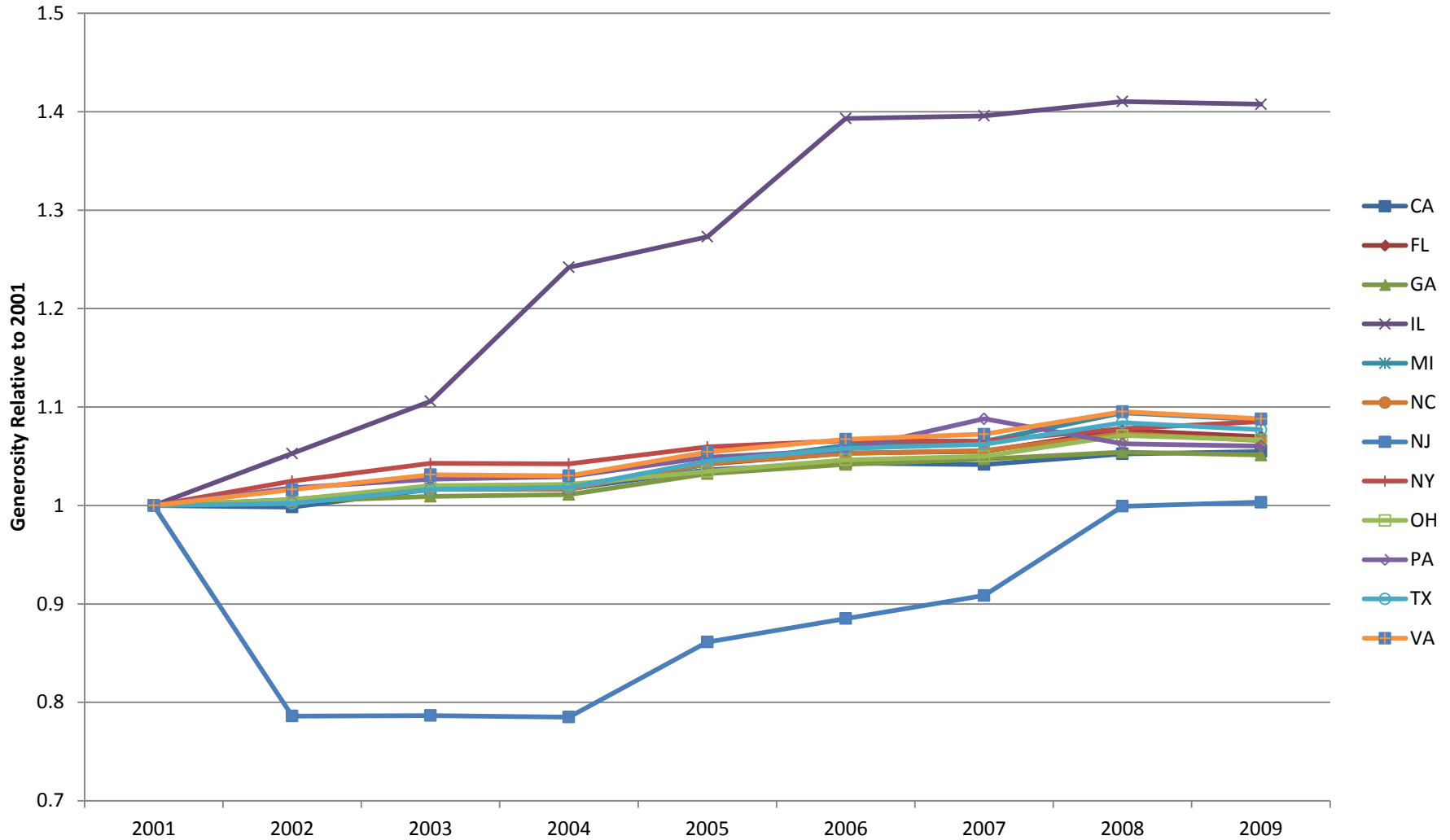
Table 1. Multiple Program Participation
Non-Immigrant Single-Parent Families Under 300% of the Poverty Line
March CPS 2002-2010

	Fraction With…	Any Family TANF Reported	Any Family SSI Reported	Any Family EITC Imputed	Any Household Food Assistance Reported	Any Family Medicaid Reported
Conditional On…						
Any Family TANF Reported		1.00	0.15	0.49	0.94	0.99
Any Family SSI Reported		0.24	1.00	0.33	0.82	0.96
Any Family EITC Imputed		0.07	0.03	1.00	0.53	0.49
Any Household Food Assistance Reported		0.17	0.09	0.67	1.00	0.72
Any Family Medicaid Reported		0.19	0.11	0.64	0.76	1.00
Unconditional		0.10	0.06	0.66	0.53	0.51

Note: Weighted by CPS sample weights.

Table 2. Summary Statistics for Key December Sample Variables
Non-Immigrant Single-Parent Families Under 300% of the Poverty Line
(N=28189)

Variable	Mean	SD	Min	Max
Food Insecurity				
Low Food Security	0.329	0.470	0.000	1.000
Log(Usual Weekly Food Spending, topcoded) (N=26698)	4.514	0.690	0.000	6.907
Usual Weekly Food Spending (N=26998, topcoded)	110.354	75.078	0.000	999.000
Need to Spend More to Meet Needs (N=26986)	0.284	0.451	0.000	1.000
Ever Run Short of Money For Food Last 12 Months (N=28068)	0.489	0.500	0.000	1.000
Adults Cut Size of Meal Last 12 months (N=28146)	0.176	0.381	0.000	1.000
Ate Less Than You Thought You Should (N=28142)	0.178	0.383	0.000	1.000
Often/Sometimes Food We Bought Did Not Last (N=28142)	0.336	0.472	0.000	1.000
Demographic Characteristics				
Any Disability in Family	0.089	0.285	0.000	1.000
Parent Disabled	0.084	0.277	0.000	1.000
Number of Kids=2	0.329	0.470	0.000	1.000
Number of Kids=3	0.131	0.337	0.000	1.000
Number of Kids= 4 or More	0.053	0.223	0.000	1.000
Race/Ethnicity = Non-Hispanic Black	0.313	0.464	0.000	1.000
Race/Ethnicity = Hispanic	0.127	0.333	0.000	1.000
Race/Ethnicity = Non-White Non-Hispanic	0.020	0.141	0.000	1.000
Parental Education = High School	0.392	0.488	0.000	1.000
Parental Education = Some College	0.350	0.477	0.000	1.000
Parental Education= College Graduate or More	0.087	0.282	0.000	1.000
Age of Youngest Child	7.394	5.403	0.000	18.000
Age of Parent	34.435	9.285	18.000	64.000
Single Father Family	0.147	0.354	0.000	1.000
Family Monthly Earnings	1228.136	1132.043	0.000	5749.544
Under 200% of the Poverty Line	0.819	0.385	0.000	1.000
Under 100% of the Poverty Line	0.510	0.500	0.000	1.000
State Policy/Economic Controls				
Unemployment Rate	5.773	1.694	2.500	13.300
UI Dependent Allowance	5.152	15.662	0.000	111.000
Child Support Enforcement Expenditure Per Capita	17.444	7.770	0.573	95.164
Non-Cash TANF Expenditures Per Capita	19.402	14.556	0.108	180.128
TANF Family Cap	0.470	0.499	0.000	1.000
TANF Strict Time Limit	0.415	0.493	0.000	1.000
TANF Strict Sanctions	0.395	0.489	0.000	1.000
TANF New Non-Citizen Eligibility	0.357	0.479	0.000	1.000
SNAP Standard Utility Allowance (N=27968, analysis includes zero for missing HI)	303.612	105.311	150.000	744.000
SNAP New Non-Citizen Adult Eligibility	0.147	0.354	0.000	1.000
SNAP Simplified Reporting	0.715	0.428	0.000	1.000
SNAP Electronic Benefit Transfer	0.959	0.176	0.000	1.000
SNAP Combined App Project for SSI Recipients	0.302	0.449	0.000	1.000
Public Housing and Voucher Units Per Capita	0.011	0.004	0.004	0.035
Imputed Real Potential Benefits (Thousands of $2005)				
Cash and Food Combined	5.711	4.903	0.000	35.203
TANF	2.017	3.074	0.000	17.256
SSI	0.615	2.071	0.000	11.817
EITC	1.324	1.543	0.000	7.364
Food Assistance	1.755	2.201	0.000	16.329
Fraction Family Medicaid Eligible	0.705	0.344	0.000	1.000

Note: Weighted by CPS sample weights.

Table 3. First Stage for One-Sample Regressions (N=28189)

	I	II	III	IV	V	VI	VII	VIII	IX	X
Dependent Variable:	Imputed Potential Real Combined Cash & Food Benefits (000s)	Imputed Family Medicaid Eligibility	Imputed Potential Real Cash Benefits (000s)	Imputed Potential Real Food Benefits (000s)	Imputed Family Medicaid Eligibility	Imputed Potential Real TANF Benefits (000s)	Imputed Potential Real SSI Benefits (000s)	Imputed Potential Real EITC Benefits (000s)	Imputed Potential Real SNAP Benefits (000s)	Imputed Family Medicaid Eligibility
Simulated Potential Real Combined Cash & Food Benefits (000s)	0.4518** (0.0432)	-0.0142** (0.0022)								
Simulated Potential Real Cash Benefits (000s)			0.7009** (0.0640)	-0.1223** (0.0215)	-0.0124** (0.0038)					
Simulated Potential Real TANF Benefits (000s)						0.6366** (0.0555)	0.0065 (0.0140)	0.0210 (0.0163)	-0.1189** (0.0207)	-0.0107** (0.0033)
Simulated Potential Real SSI Benefits (000s)						0.0319 (0.0903)	0.7715** (0.0675)	0.0958** (0.0246)	0.1198+ (0.0642)	-0.0144 (0.0125)
Simulated Potential Real EITC Benefits (000s)						-0.2584** (0.0725)	0.0441+ (0.0260)	0.7531** (0.0473)	-1.0180** (0.0410)	-0.0300** (0.0088)
Simulated Potential Real Food Benefits (000s)			-0.1351* (0.0573)	0.4248** (0.0176)	-0.0164** (0.0023)	-0.1656** (0.0582)	0.0283* (0.0110)	0.0321+ (0.0183)	0.5457** (0.0190)	-0.0144** (0.0025)
Simulated Family Medicaid Elig	-3.4130** (0.7511)	0.6258** (0.0479)	-1.3695** (0.3791)	-1.3733** (0.2261)	0.6349** (0.0463)	-0.7009+ (0.3730)	-0.5759** (0.1371)	0.1728 (0.1615)	-0.3006 (0.1931)	0.6529** (0.0502)
Individual Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Policy Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
State Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
F Statistic on Instruments	85.86	85.35	60.93	199.70	65.00	55.79	45.42	54.02	330.19	40.62
P-Value on F test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Standard errors in parentheses clustered on state. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. Individual Controls include age of youngest child, number of kids interacted with disability status, and indicators for race*education. Policy Controls include state unemployment rate, child support enforcement spending per capita, and UI dependency allowance. All regressions include state fixed effects and year fixed effects. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.

Table 4. One-Sample OLS and IV (N=28189)

		I	II	III	IV	V	VI	VII	VIII
		OLS	IV (one sample)	IV (one sample)	IV (one sample)	IV (one sample)	IV (one sample)	IV (one sample)	IV (one sample)
Dependent Variable:		LFS	LFS	LFS	LFS	LFS	LFS	LFS	LFS
Imputed Real Potential Benefits Cash & Food (000s)		0.0072**	-0.0202**			-0.0237**	-0.0192*	-0.0152**	-0.0177**
(Instrumented in Columns III and higher)		(0.0013)	(0.0061)			(0.0077)	(0.0084)	(0.0054)	(0.0054)
Imputed Real Potential Benefits Cash (000s)				-0.0177**					
(Instrumented in Columns III and higher)				(0.0054)					
Real Imputed Potential TANF Benefits (000s)					-0.0090	0.0131			
(Instrumented in Columns III and higher)					(0.0091)	(0.0110)			
Real Imputed Potential SSI Benefits (000s)					-0.0328*		-0.0087		
(Instrumented in Columns III and higher)					(0.0166)		(0.0236)		
Real Imputed Potential EITC Benefits (000s)					-0.0272			-0.0164	
(Instrumented in Columns III and higher)					(0.0179)			(0.0183)	
Real Imputed Potential Food Benefits (000s)				-0.0257*	-0.0181+				-0.0080
(Instrumented in Columns III and higher)				(0.0125)	(0.0094)				(0.0120)
Family Medicaid Eligibility		0.0781**	-0.0226	-0.0105	0.0138	0.0196	-0.0357	0.0303	-0.0105
(Instrumented in Columns III and higher)		(0.0145)	(0.0786)	(0.0709)	(0.0708)	(0.0625)	(0.0742)	(0.0648)	(0.0709)
Individual Controls		yes	yes	yes	yes	yes	yes	yes	yes
Policy Controls		yes	yes	yes	yes	yes	yes	yes	yes
State Fixed Effects		yes	yes	yes	yes	yes	yes	yes	yes
Year Fixed Effects		yes	yes	yes	yes	yes	yes	yes	yes

Note: Standard errors in parentheses clustered on state. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. Individual Controls include age of youngest child, number of kids interacted with disability status, and indicators for race*education. Policy Controls include state unemployment rate, child support enforcement spending per capita, and UI dependency allowance. All regressions include state fixed effects and year fixed effects. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.

Table 5. First Stage for Two-Sample Regressions (N=68702)

	Actual Reported Benefits Real Cash & Food Combined (000s)	Fraction Family Medicaid Actual Participation	Actual Reported Benefits Real Cash (000s)	Actual Reported Benefits Real Food (000s)	Fraction Family Medicaid Actual Participation	Actual Reported Benefits Real TANF (000s)	Actual Reported Benefits Real SSI (000s)	Imputed Real EITC (000s)
	I	II	III	IV	V	VI	VII	VIII
Simulated Potential Real Combined Cash & Food Benefits (000s)	0.1909**	0.0048*						
	(0.0255)	(0.0021)						
Simulated Potential Real Cash Benefits (000s)			0.3260**	-0.0474*	0.0050			
			(0.0250)	(0.0199)	(0.0049)			
Simulated Potential Real TANF Benefits (000s)						0.2211**	0.0440+	-0.0048
						(0.0370)	(0.0231)	(0.0142)
Simulated Potential Real SSI Benefits (000s)						0.0637	0.2761**	0.1128**
						(0.0388)	(0.0841)	(0.0211)
Simulated Potential Real EITC Benefits (000s)						-0.0078	-0.1765**	0.9783**
						(0.0508)	(0.0490)	(0.0408)
Simulated Potential Real Food Benefits (000s)			0.0196	0.0718**	0.0046	-0.0607*	0.0071	0.0175
			(0.0219)	(0.0148)	(0.0036)	(0.0237)	(0.0183)	(0.0155)
Simulated Family Medicaid Elig	-2.0039**	0.1161*	-0.2607	-1.4128**	0.1169*	-0.2951	-0.2125	0.0201
	(0.5246)	(0.0483)	(0.2331)	(0.2825)	(0.0503)	(0.2019)	(0.1835)	(0.1261)
Individual Controls	yes	yes	yes	yes	yes	yes	yes	yes
Policy Controls	yes	yes	yes	yes	yes	yes	yes	yes
State Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
F Statistics on Instruments	37.91	9.30	84.90	11.48	7.71	32.12	19.34	297.06
P-Value on F test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Standard errors in parentheses clustered on state. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. Individual Controls include age of youngest child, number of kids interacted with disability status, and indicators for race*education. Policy Controls include state unemployment rate, child support enforcement spending per capita, and UI dependency allowance. All regressions include state fixed effects and year fixed effects. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.

Table 6. Two-Sample IV (N=68702 first stage, N=28189 second stage)

Dependent Variable:	I LFS	II LFS	III LFS	IV LFS	V LFS	VI LFS	VII LFS
(Instrumented) Actual Reported Real Cash & Food (000s)	-0.0405* (0.0180)			-0.0589** (0.0228)	-0.0379 (0.0351)	-0.0362* (0.0166)	-0.0310 (0.0301)
(Instrumented) Real Cash (000s)			-0.0310 (0.0265)				
(Instrumented) Actual Reported Benefits Real TANF (000s)		-0.0011 (0.0548)		0.0542 (0.0512)			
(Instrumented) Actual Reported Benefits Real SSI (000s)		-0.0886 (0.0801)			-0.0187 (0.1161)		
(Instrumented) Imputed Real EITC (000s)		-0.0610* (0.0255)				-0.0166 (0.0162)	
(Instrumented) Actual Reported Benefits Real Food (000s)		-0.0406 (0.0381)	-0.0748 (0.0730)				-0.0438 (0.0884)
(Instrumented) Fraction Family Medicaid Actual Participation	-0.2263 (0.3158)	-0.0893 (0.1836)	-0.5206 (0.7760)	-0.1533 (0.2881)	-0.2741 (0.6091)	-0.0567 (0.1590)	-0.5206 (0.8900)
Individual Controls	yes	yes	yes	yes	yes	yes	yes
Policy Controls	yes	yes	yes	yes	yes	yes	yes
State Fixed Effects	yes	yes	yes	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes	yes	yes	yes

Note: Standard errors in parentheses cluster bootstrapped using 2000 replications. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. Individual Controls include age of youngest child, number of kids interacted with disability status, and indicators for race*education. Policy Controls include state unemployment rate, child support enforcement spending per capita, and UI dependency allowance. All regressions include state fixed effects and year fixed effects. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.

Table 7. Alternative Outcomes for One-Sample and Two-Sample IV

	I	II	III	IV	V	VI	VII
Dependent Variable:	Log (Usual Weekly Food Spending)	Usual Weekly Food Spending	Need More to Meet Food Needs of Household	Last 12 Months Ever Ran Short of Food Money	Last 12 Months Ever Cut Meal Size or Skip Meals b/c Not Enough Money for Food	Last 12 Months Ever Ate Less Than Thought You Should b/c Not Enough Money for Food	Food Bought Didn't Last and Didn't Have Money to Buy More
One Sample Results							
(Instrumented) Imputed Eligibility Real Cash & Food (000s)	-0.0114	-3.0494**	-0.0147*	-0.0155*	-0.0115*	-0.0123*	-0.0141*
	(0.0111)	(1.0414)	(0.0073)	(0.0061)	(0.0055)	(0.0054)	(0.0056)
(Instrumented) Family Medicaid Eligibility	-0.1805	-33.4863*	-0.0412	0.0308	0.0236	-0.0181	0.0805
	(0.1567)	(16.7018)	(0.0926)	(0.0602)	(0.0679)	(0.0816)	(0.0798)
THESE TWO SAMPLE ARE CORRECT AS OF 8.2.13							
Two Sample Results							
(Instrumented) Reported Actual Cash & Food (000s)	0.0014	-1.8219	-0.0266	-0.0383*	-0.0283*	-0.0240+	-0.0424**
	(0.0297)	(3.2945)	(0.0190)	(0.0171)	(0.0144)	(0.0144)	(0.0156)
(Instrumented) Reported Actual Family Medicaid Participation	-0.6128	-119.0012	-0.2268	-0.0356	-0.0242	-0.1506	0.1157
	(0.5896)	(76.2278)	(0.3519)	(0.2380)	(0.2691)	(0.3055)	(0.3310)

Note: Standard errors in parentheses clustered on state. For two sample analyses standard errors are cluster bootstrapped using 2000 replications. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. All regressions include state fixed effects, year fixed effects, and all other controls in previous tables. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.

Table 8. Preferred and Naïve One-Sample IV and Two-Sample IV Estimation

One-Sample IV	Dependent Variable:	I LFS	II LFS	III LFS	IV LFS	V LFS	VI LFS
Real Imputed Potential TANF Benefits (000s)		**-0.0090**	**-0.0179***				
(Instrumented)		(0.0091)	(0.0081)				
Real Imputed Potential SSI Benefits (000s)		**-0.0328***		**-0.0411****			
(Instrumented)		(0.0166)		(0.0105)			
Real Imputed Potential EITC Benefits (000s)		**-0.0272**			**-0.0184**		
(Instrumented)		(0.0179)			(0.0179)		
Real Imputed Potential Food Benefits (000s)		**-0.0181+**				**-0.0280***	
(Instrumented)		(0.0094)				(0.0131)	
Family Imputed Medicaid Eligibility		**0.0138**					**-0.0350**
(Instrumented)		(0.0708)					(0.0805)

Two-Sample IV	Dependent Variable:	LFS	LFS	LFS	LFS	LFS	LFS
Actual Reported Benefits Real TANF (000s)		**-0.0011**	**-0.0517+**				
(Instrumented)		(0.0548)	(0.0297)				
Actual Reported Benefits Real SSI (000s)		**-0.0886**		**-0.1001***			
(Instrumented)		(0.0801)		(0.0501)			
Imputed Real EITC (000s)		**-0.0610***			**-0.0154**		
(Instrumented)		(0.0255)			(0.0151)		
Actual Reported Benefits Real Food (000s)		**-0.0406**				**1.2454**	
(Instrumented)		(0.0381)				(15.6068)	
Fraction Family Medicaid Actual Participation		**-0.0893**					**-0.1151**
(Instrumented)		(0.1836)					(0.3496)

Note: Standard errors in parentheses clustered on state. For two sample analyses standard errors are cluster bootstrapped using 2000 replications. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. All regressions include state fixed effects, year fixed effects, and all other controls in previous tables. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.

Appendix Table 1. Summary Statistics on Program Benefits and Participation
Non-Immigrant Single-Parent Families Under 300% of the Poverty Line
(N=28189 December, N=68702 March)

Variable	Sample	Mean	SD	Min	Max
Cash & Food Combined					
Simulated Real Potential Benefits (000s)	December	5.301	3.339	1.473	26.595
Simulated Real Potential Benefits (000s)	March	5.416	3.332	1.512	24.703
Imputed Real Potential Benefits (000s)	December	5.711	4.903	0.000	35.203
Imputed Real Potential Benefits (000s)	March	5.678	4.882	0.000	34.520
Any Imputed Potential Benefits	December	0.896	0.306	0.000	1.000
Any Imputed Potential Benefits	March	0.896	0.306	0.000	1.000
Actual Reported Real Benefits (000s, includes imputed EITC)	March	3.473	3.699	0.000	53.965
Any Reported Benefits (includes imputed EITC)	March	0.849	0.358	0.000	1.000
Cash Only (includes TANF, SSI, and EITC)					
Simulated Real Potential Benefits (000s)	December	3.652	2.601	1.183	22.759
Simulated Real Potential Benefits (000s)	March	3.767	2.647	1.233	22.187
Imputed Real Potential Benefits (000s)	December	3.956	3.620	0.000	26.302
Imputed Real Potential Benefits (000s)	March	3.938	3.629	0.000	24.799
Any Imputed Potential Benefits	December	0.892	0.311	0.000	1.000
Any Imputed Potential Benefits	March	0.893	0.310	0.000	1.000
Actual Reported Real Benefits (000s, includes imputed EITC)	March	2.215	2.670	0.000	52.319
Any Reported Benefits (includes imputed EITC)	March	0.742	0.438	0.000	1.000
TANF					
Simulated Real Potential Benefits (000s)	December	1.648	1.328	0.000	12.583
Simulated Real Potential Benefits (000s)	March	1.541	1.378	0.143	10.863
Imputed Real Potential Benefits (000s)	December	2.017	3.074	0.000	17.256
Imputed Real Potential Benefits (000s)	March	1.768	2.860	0.000	17.870
Any Imputed Potential Benefits	December	0.384	0.486	0.000	1.000
Any Imputed Potential Benefits	March	0.365	0.481	0.000	1.000
Actual Reported Real Benefits (000s)	March	0.317	1.338	0.000	27.140
Any Reported Benefits	March	0.096	0.294	0.000	1.000
SSI					
Simulated Real Potential Benefits (000s)	December	0.619	1.994	0.000	11.817
Simulated Real Potential Benefits (000s)	March	0.678	2.128	0.000	11.817
Imputed Real Potential Benefits (000s)	December	0.615	2.071	0.000	11.817
Imputed Real Potential Benefits (000s)	March	0.678	2.128	0.000	11.817
Any Imputed Potential Benefits	December	0.083	0.275	0.000	1.000
Any Imputed Potential Benefits	March	0.097	0.296	0.000	1.000
Actual Reported Real Benefits (000s)	March	0.405	1.910	0.000	51.000
Any Reported Benefits	March	0.059	0.236	0.000	1.000
EITC					
Simulated Real Potential Benefits (000s)	December	1.385	0.581	0.000	3.413
Simulated Real Potential Benefits (000s)	March	1.492	1.527	0.000	7.374
Imputed Real Potential Benefits (000s)	December	1.324	1.543	0.000	7.364
Imputed Real Potential Benefits (000s)	March	1.492	1.527	0.000	7.374
Any Imputed Potential Benefits	December	0.549	0.498	0.000	1.000
Any Imputed Potential Benefits	March	0.665	0.472	0.000	1.000
Actual Reported Real Benefits (000s)	March	n/a	n/a	n/a	n/a
Any Reported Benefits	March	n/a	n/a	n/a	n/a
Food Assistance					
Simulated Real Potential Benefits (000s)	December	1.649	1.434	0.249	9.164
Simulated Real Potential Benefits (000s)	March	1.740	2.185	0.000	20.078
Imputed Real Potential Benefits (000s)	December	1.755	2.201	0.000	16.329
Imputed Real Potential Benefits (000s)	March	1.740	2.185	0.000	20.078
Any Imputed Potential Benefits	December	0.780	0.414	0.000	1.000
Any Imputed Potential Benefits	March	0.778	0.416	0.000	1.000
Actual Reported Real Benefits (000s)	March	1.258	2.002	0.000	14.616
Any Reported Benefits	March	0.532	0.499	0.000	1.000
Medicaid					
Simulated Fraction Family Eligible	December	0.680	0.176	0.200	1.000
Simulated Fraction Family Eligible	March	0.702	0.344	0.000	1.000
Imputed Fraction Family Eligible	December	0.705	0.344	0.000	1.000
Imputed Fraction Family Eligible	March	0.702	0.344	0.000	1.000
Any Family Member Imputed Eligible	December	0.861	0.346	0.000	1.000
Any Family Member Imputed Eligible	March	0.861	0.346	0.000	1.000
Actual Reported Fraction Family Participating	March	0.406	0.433	0.000	1.000
Any Reported Family Member Participating	March	0.507	0.500	0.000	1.000

Note: All amounts in real 2005 dollars. See text for a description of variable construction. Weighted by CPS sample weights.

Appendix Table 2. Annual Means of Program Benefits and Participation (weighted)
Non-Immigrant Single-Parent Families Under 300% of the Poverty Line

	2001	2002	2003	2004	2005	2006	2007	2008	2009	Percent Change 2001-2009
Panel A. Imputed Real Potential Benefits (000s), December CPS										
Cash and Food Combined	5.396	5.483	5.576	5.621	5.643	5.523	5.567	5.901	6.591	0.22
Cash	3.910	3.899	3.947	3.910	3.952	3.858	3.924	3.940	4.239	0.08
TANF	1.762	1.825	1.954	1.925	2.058	1.948	2.078	2.226	2.440	0.38
SSI	0.642	0.547	0.560	0.576	0.613	0.654	0.643	0.624	0.674	0.05
EITC	1.324	1.370	1.313	1.344	1.281	1.317	1.324	1.296	1.344	0.02
Food Assistance	1.486	1.584	1.629	1.711	1.691	1.665	1.643	1.961	2.351	0.58
Fraction Medicaid Eligible	0.678	0.678	0.687	0.692	0.692	0.695	0.715	0.738	0.760	0.12
Panel B. Actual Reported Benefits (000s), March CPS										
Cash and Food Combined	3.300	3.301	3.378	3.393	3.475	3.443	3.380	3.538	4.008	0.21
Cash	2.292	2.242	2.247	2.184	2.236	2.193	2.150	2.137	2.260	-0.01
TANF	0.352	0.351	0.411	0.322	0.353	0.310	0.259	0.249	0.259	-0.26
SSI	0.407	0.375	0.354	0.404	0.466	0.416	0.383	0.403	0.438	0.08
EITC (imputed)	1.533	1.516	1.482	1.458	1.416	1.467	1.509	1.486	1.563	0.02
Food Assistance	1.007	1.059	1.131	1.208	1.239	1.250	1.230	1.401	1.748	0.73
Fraction Family Receiving Medicaid	0.364	0.372	0.401	0.406	0.408	0.407	0.410	0.433	0.449	0.23
Panel C. Simulated Real Potential Benefits (000s), December CPS										
Cash and Food Combined	5.338	5.322	5.214	5.300	5.247	5.182	5.177	5.145	5.749	0.08
Cash	3.810	3.741	3.665	3.659	3.656	3.613	3.592	3.440	3.702	-0.03
TANF	1.815	1.776	1.711	1.685	1.673	1.600	1.574	1.504	1.518	-0.16
SSI	0.648	0.559	0.560	0.581	0.628	0.671	0.664	0.604	0.655	0.01
EITC	1.347	1.406	1.394	1.392	1.355	1.343	1.355	1.333	1.529	0.14
Food Assistance	1.528	1.581	1.549	1.641	1.590	1.569	1.585	1.705	2.047	0.34
Fraction Medicaid Eligible	0.678	0.667	0.667	0.674	0.674	0.680	0.686	0.689	0.701	0.03
Panel D. Simulated Real Potential Benefits (000s), Fixed March 2001 Sample										
Cash and Food Combined	5.623	5.668	5.593	5.553	5.437	5.394	5.425	5.454	5.986	0.06
Cash	4.016	4.035	3.963	3.867	3.780	3.746	3.724	3.653	3.891	-0.03
TANF	1.836	1.811	1.760	1.691	1.627	1.578	1.529	1.493	1.517	-0.17
SSI	0.612	0.618	0.611	0.606	0.599	0.603	0.605	0.595	0.634	0.04
EITC	1.568	1.605	1.592	1.570	1.554	1.565	1.590	1.566	1.741	0.11
Food Assistance	1.607	1.633	1.630	1.686	1.656	1.648	1.701	1.801	2.095	0.30
Fraction Medicaid Eligible	0.685	0.679	0.688	0.692	0.706	0.719	0.726	0.745	0.744	0.09

Note: All amounts in real 2005 dollars. See text for a description of variable construction. March samples are attached to the previous survey year. Weighted by CPS sample weights.

Appendix Table 3. Alternative Samples

	Sample:	Married<300	Single <300	Married <200	Single<200	Married<100	Single<100
One-Sample IV	Dependent Variable:	LFS	LFS	LFS	LFS	LFS	LFS
Imputed Eligibility Real Cash & Food (000s)		-0.0062	-0.0202**	-0.0069	-0.0193**	0.0628	-0.0124
		(0.0080)	(0.0061)	(0.0094)	(0.0069)	(0.1670)	(0.0101)
Family Medicaid Eligibility		0.0413	-0.0226	0.1045	-0.0678	1.1349	0.3098
		(0.0684)	(0.0786)	(0.1434)	(0.1281)	(2.6574)	(0.3112)

	Sample:	Married<300	Single <300	Married<200	Single <200	Married<100	Single<100
Two-Sample IV	Dependent Variable:	LFS	LFS	LFS	LFS	LFS	LFS
Imputed Eligibility Real Cash & Food (000s)		-0.0898	-0.0405*	-0.0998	-0.0310+	-0.0296	-0.0390+
		(1.4152)	(0.0180)	(2.4263)	(0.0180)	(0.5811)	(0.0226)
Family Medicaid Eligibility		1.2893	-0.2263	1.7784	-0.3225	0.7718	-0.0657
		(21.7888)	(0.3158)	(41.3058)	(0.3635)	(13.2677)	(0.3725)

Note: Standard errors in parentheses clustered on state. For two sample analyses standard errors are cluster bootstrapped using 2000 replications. +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. All regressions include state fixed effects, year fixed effects, and all other controls in previous tables. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.

Appendix Table 4. Robustness and Placebo Tests (One-Sample IV)

	I	II	III	IV	V	VI	VII	VIII	IX
	Baseline	Detailed Individual Controls	Detailed Policy Controls	Detailed Ind & Policy Controls	Family Income Controls	Drop 2009	Drop AK, HI, and DC	Placebo: Outcome is Income as a Percent of Poverty	Placebo: Outcome is Parent Employment
Dependent Variable:	LFS	LFS	LFS	LFS	LFS	LFS	Income	Income	Employment
Imputed Eligibility Real Cash & Food (000s)	-0.0202**	-0.0223**	-0.0203**	-0.0225**	-0.0204**	-0.0141*	-0.0208**	0.4132	0.0057
	(0.0061)	(0.0074)	(0.0061)	(0.0075)	(0.0061)	(0.0058)	(0.0062)	(1.0032)	(0.0069)
Family Medicaid Eligibility	-0.0226	-0.0986	-0.0243	-0.1090	-0.0683	0.0223	-0.0291	-26.0256	-0.0421
	(0.0786)	(0.0979)	(0.0835)	(0.1036)	(0.0967)	(0.0893)	(0.0807)	(17.4938)	(0.0915)

Note: Standard errors in parentheses clustered on state.   +, *, and ** indicate statistical significance at the 10, 5, and 1 percent levels. All regressions include state fixed effects, year fixed effects, and all other controls in previous tables. Detailed individual controls include the age of the respondent, whether the parent is male or female, age of the youngest child interacted with disability status, and race-education cell interacted with disability status. Detailed policy controls discussed in the text. Income Controls include whether the family is under 100% of poverty or under 200% of poverty. Amounts in thousands of real 2005 dollars. Weighted by CPS sample weights.