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The Role of Food Stamps in Consumption Stabilization

Abstract: The Food Stamp Program provides assistance to households with incomes and assets below fixed thresholds. Although it is the largest entitlement program in the social safety net, little is known about the effect of food stamps on stabilizing fluctuations in household income and consumption. To estimate the volatility of income and the attendant reduction in volatility due to food stamps we use data from the Panel Study of Income Dynamics over 1980-1999 along with a model of income that admits permanent and transitory components as well as random growth rate heterogeneity. We then specify a model relating income changes to consumption changes for use in a variance decomposition. This decomposition highlights the role of food stamps in stabilizing food consumption volatility. We estimate the income and food consumption models across a host of samples that vary in the degree of 'risk' of food stamp take-up, ranging from all families to those families that lie below the gross income threshold for food stamp eligibility. We find that across all families food stamps reduced income volatility by about 3 percent and consumption volatility by about 4 percent, but this stabilizing role is a much more pronounced 12 and 14 percent among families at high ex ante risk of food stamp participation. Despite the positive role of the Food Stamp Program in smoothing income and consumption shocks there was a marked decline of nearly two-thirds in the income and consumption smoothing benefits of the program in the early 1990s relative to the 1980s. This stabilizing role improved only modestly by the end of the 1990s.

The Food Stamp Program is an integral component of the social safety net in the United States. This cornerstone of food assistance programs works under the principle that everyone has a right to food for themselves and their families and, hence, with few exceptions, the program is available to all citizens who meet income and asset tests. Most participants receive an Electronic Benefit Transfer (EBT) card for the purchase of food in authorized, privately run retail food outlets. Subject to passing the income and asset limits, the program is an entitlement to needy families, and participation moves countercyclically with the state of the macroeconomy (Ziliak, Gundersen, and Figlio 2003). At its peak in 1994 over 27 million people received food stamp benefits at an expense of $25 billion to the federal government. In terms of total expenditures, the Food Stamp Program lies between the major cash-assistance program, Temporary Assistance to Needy Families (TANF), and the major work-support program, the Earned Income Tax Credit (Scholz and Levine 2002). In some states with low TANF benefit levels, food stamp benefits can constitute more than 50 percent of the disposable income of TANF recipients. Despite the Food Stamp Program's entitlement status and its potential role as a consumption-insurance mechanism when incomes and assets are transitorily (or permanently) low, research on the consumption stabilizing impact of food stamps is largely absent. In this paper we examine the effect of food stamps on income and consumption volatility.

Food stamps are part of an extensive system of government programs that provide income insurance when incomes are low. These so-called automatic stabilizers are designed to smooth consumption in the face of both aggregate business-cycle shocks and idiosyncratic shocks such as an adverse health event or a significant change in family composition. Some of these programs are explicit and fall under the rubric of "social insurance" (e.g., unemployment insurance (UI), social security, and disability insurance). Others are known as "means-tested

transfers," including TANF, food stamps, and Medicaid. In addition to these explicit programs there are more subtle, but equally important, insurance programs in the U.S. tax code such as the federal income tax, the payroll tax, and the Earned Income Tax Credit (EITC). While there has been research on the consumption-smoothing benefits of UI (Hamermesh 1982; Gruber 1997), TANF (Gruber 2000), and income taxes (Auerbach and Feenberg 2000; Kniesner and Ziliak 2002a,b), research on the potential stabilizing benefits of the Food Stamp Program is lacking.

Rectifying the scarcity of research on the stabilizing role of food stamps is especially important after the passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). This legislation eliminated the old cash assistance program, Aid to Families with Dependent Children (AFDC), and replaced it with the block-granted TANF program. In addition, the 1996 welfare reform had a direct effect on the Food Stamp Program by ending the eligibility of some recipients, reducing average benefit levels, and requiring states to replace paper coupons with EBT cards. Beyond the direct effect this legislation had an indirect effect of the Food Stamp Program because nearly half of food stamp recipients also receive cash welfare. Perhaps of more importance from the perspective of the insurance benefits of income transfers, PRWORA eliminated the entitlement status of AFDC. Consequently the Food Stamp Program is positioned more prominently as a potential idiosyncratic and countercyclical consumption stabilizer for low-income households.

We use data on household heads from the Panel Study of Income Dynamics (PSID) over 1980–1999 to examine the effect of food stamps on income and food consumption stabilization. Specifically we treat food stamps as cash and ascertain the effect of food stamp income on income volatility, defined as the squared residual from a human-capital income growth model with and without unobserved heterogeneity. We then posit an empirical model relating

consumption changes to idiosyncratic income changes, macroeconomic shocks, and changes in observed demographics. The estimated effect of income changes on consumption changes is then used as an input for a variance decomposition of the role of food stamps on food consumption volatility. We permit heterogeneity in the impact of food stamps on income and consumption smoothing by splitting the sample based on 'risk' of food stamp take-up, ranging from a low-risk sample of all families to a high-risk sample of families with current incomes less than 130 percent of the poverty line.

We find that across all families food stamps reduced income volatility by about 3 percent and consumption volatility by about 4 percent, but this stabilizing role is a much more pronounced 12 and 14 percent among families at high ex ante risk of food stamp participation. Despite the positive role of the Food Stamp Program in smoothing income and consumption shocks there was a marked decline of nearly two-thirds in the income and consumption smoothing benefits of the program in the early 1990s relative to the 1980s. This situation had improved only modestly by the end of the 1990s.

II. Background

Households have to meet three financial criteria to qualify for the Food Stamp Program: the gross income, net income, and asset tests. A household's gross income before taxes in the previous month must be at or below 130 percent of the poverty line. Households with disabled persons or headed by someone over the age of 60 are exempt from this test (although they must pass the net income test). After passing the gross income test, a household must have a net monthly income at or below the poverty line. The Food Stamp Program calculates net income in the following manner. First, a standard deduction is subtracted from a household's gross income. Households with earnings from the labor market then deduct 20 percent of these

earnings from their gross income. Deductions are also taken for child care and/or care for disabled dependents, medical expenses, and excessive shelter expenses. Finally, net-income-eligible households must meet a liquid-asset test (i.e. non-business, non-housing assets) and vehicle-value test. All net-income-eligible households with liquid assets less than $2,000 qualify for the program ($3,000 for households headed by someone over age 60). The value of a vehicle above $4,650 (in 2002) is also considered an asset unless it is used for work or for the transportation of disabled persons. The amount of food stamps a family receives is equal to the maximum food stamp benefit level minus 0.3 times its net income. So a family with zero net income will receive the maximum benefit level. Food stamp recipients must occasionally recertify their continuing eligibility and the proper amount of benefits. The frequency of recertification depends on the state of residence and the source of a household's income.

We now turn to a discussion of changes in eligibility and participation rates in the 1980s and 1990s. Using a sample of families from the PSID (described below), we present in Figure 1 the percentage of households eligible for food stamps under three criteria—the income test alone; the asset test alone; and by both tests. We concentrate on the final category. We present this information for the four calendar years of our sample where complete asset information is available—1983, 1988, 1993, and 1998. These four years permit us to illustrate how food stamp eligibility rates change in periods near the peaks of economic expansions (1988 and 1998) and near the troughs of economic contractions (1983 and 1993).

[Figure 1 here]

From 1983 to 1988 the number of households eligible for food stamps fell by almost 15 percent. A similar fall occurred from 1993 to 1998. This is consistent with our expectations insofar as an improving economy leads to declines in the poverty rate (see, e.g., Gundersen and

Ziliak 2002) and, hence, the number of households eligible for food stamps. From one contraction to the next and from one expansion to the next, we also observe declines in the number of eligible households. This appears to be in large part due to the steady decline in the number of asset eligible households, from 33.5 percent in 1983 to 21.3 percent in 1998. The constant nominal asset eligibility criteria, coupled with the secular increase in real wealth through the 1990s, is likely responsible for this decline.

[Table 1 here]

For various income categories, in Table 1 we document the proportion of households participating in the Food Stamp Program. As in Figure 1, we confine our analysis to the years with asset information in the PSID, and for brevity, limit our discussion here to food stamp eligible households (i.e. households that pass both the income and asset tests). From 1983 to 1998 there was a secular decline in the participation rates among eligible households. In 1983, about 45 percent of eligible households received food stamps but by 1998 this fell to 26 percent. We use annual income for our measure of food stamp eligibility, but the Food Stamp Program uses income from the previous month as the eligibility criteria. Nevertheless, our estimates of participation rates are similar to analyses using monthly data from the Survey of Income and Program Participation (SIPP). Using data from the second half of the 1992 calendar year, Gundersen and Oliveira (2001, Table 1) report a monthly participation rate amongst eligible households of 40.0 percent. In 1993, our participation rate is a slightly lower 31.2 percent.[1, 2]

The ratio of food stamp benefits to income in Table 1 (defined over all gross income and asset eligible households, not just food stamp recipients) also fell by a large amount over this time period, from 6.8 percent in 1983 to 3.0 percent in 1998. The ratio of food stamp benefits to transfer income started in 1983 at almost 20 percent but fell to a little less than 15 percent in

1998. In the analysis below one should note the potential interactions between the Food Stamp Program and other transfer programs. For example, households receiving TANF or SSI are categorically eligible for food stamps, though the income from such programs is used in determining the size of the food stamp benefit. On the other hand household's receiving UI are not categorically eligible for food stamps, but again the income from UI is used in determining the size of the food stamp benefit. The latter implies that a laid-off household head who subsequently receives UI must also apply for food stamps and that the food assistance will be less than a similarly situated household with no UI income. These program interactions may explain part of the stability of the food stamp to transfer income ratio.

III. Empirical Framework

The data presented in Table 1 and Figure 1 indicate that there were cyclical and secular changes in the utilization of food stamps over the 1980s and 1990s. In this section we propose an empirical framework to document how these changes translated into changes in the program's role as an income and consumption stabilizer. While food stamps are an in-kind transfer program the bulk of research on the program treats food stamp benefits as cash. Moreover, in general, most food stamp recipients are *inframarginal*, implying that they spend more on food than that allotted by food stamps (Fraker 1990) and, in our samples, all food stamp recipients are *inframarginal*. As a consequence we expect food stamps to smooth both income (i.e. cash income plus food stamps) and consumption. One other possibility is for the receipt of food stamps to lead to a decrease in the number of hours worked. This negative labor supply response may then lead to more stable cash income. However, previous studies have found there is only a small change in the labor supply of food stamp recipients in comparison to similar non-recipients

(Hagstrom, 1996; Fraker and Moffitt, 1988). In the absence of any sizable labor supply response the model below captures something akin to the insurance value of the program.

A. Income Volatility

We begin our empirical analysis with a model of income volatility. Specifically we follow the recent literature on earnings instability (Gottschalk and Moffitt 1994; Dynarski and Gruber 1997) by decomposing income into 'permanent' and 'transitory' components. The general structure of the income model for household *i* in time *t* is given as

$$(1) \qquad \ln y_{it}^{d} = \mu_i + \delta_i t + (x_{it}\gamma)t + \theta_t + \eta_{it},$$

where y_{it}^{d} is disposable income, μ_i is a household-specific and time-invariant permanent component determining log income, $\delta_i t$ permits household-specific random growth into the income process, $(x_{it}\gamma)t$ admits observable demographics to affect income growth, θ_t captures year-specific shocks to income, and $\eta_{it} = \eta_{it-1} + \nu_{it}$ is parameterized as a random walk (under the assumption that ν_{it} is serially uncorrelated and has constant variance) to permit serial dependence in income levels. We define disposable income as $y_{it}^{d} \equiv y_{it}(1 + g_{it})$, where $g_{it} = \frac{G_{it}}{y_{it}}$ is the average food stamp transfer rate defined as the ratio of food stamp benefits (G_{it}) to after-tax (non food stamp) income.

First differencing equation (1) to eliminate the time-invariant permanent component and the random walk yields the focal income equation of interest

$$(2) \qquad \Delta \ln y_{it}^{d} = \delta_i + x_{it}\gamma + \psi_t + \nu_{it},$$

where ψ_t is a re-normalized vector of time effects. In equation (2) we allow for unrestricted correlation between δ_i and x_{it}, but no correlation between ν_{it} and δ_i or x_{it}. Government policy

stabilizes disposable income through many avenues. Our interest here lies in determining how the Food Stamp Program has affected the variance of ν_{it} over the past two decades. To this end we estimate the model in equation (2) via the standard fixed-effects estimator with and without food stamps included in the dependent variable (i.e. with g_{it} permitted to be nonzero or forced to be zero $\forall i,t$) and construct the year-by-year estimate of the residual variance as $\frac{1}{N}\sum_{i=1}^{N}\hat{\nu}_{it}^2$. For robustness purposes we also estimate models with the random growth heterogeneity term δ_i suppressed.

B. Consumption Volatility

The purpose of the Food Stamp Program is "…to provide low-income persons of limited resources with access to a nutritious, healthful diet (U.S. Department of Agriculture, Food and Nutrition Service, p. 7)." Two central questions are then: How does the volatility of income translate into the volatility of consumption? and How does the Food Stamp Program assist in mitigating those consumption changes?

To address these questions we draw from the extensive literature on consumption insurance between and within households (Deaton 1992, 1997). The theory of complete consumption insurance postulates a central planner who allocates resources under uncertainty across households and over time to equalize the growth rates in the marginal utilities of consumption. Under the standard assumption of isoelastic household preferences, the key testable implication derived from the theory is that once one controls for aggregate resources and the state of the economy, idiosyncratic resources do not determine household consumption growth. This prediction has been tested by a number of authors and with few exceptions the assumption of complete insurance is rejected (Attanasio and Davis 1996; Cochrane 1991;

Hayashi, Altonji, and Kotlikoff 1996). The implication then is that consumption growth is a function of both aggregate and household-specific resources. Moreover, based on the results of Attanasio and Davis (1996), Blundell, Pistaferri, and Preston (2001), and Kniesner and Ziliak (2002a), even if complete insurance is not present, channels of partial insurance clearly exist to stabilize consumption. We examine whether and by how much the Food Stamp Program functions as such a channel.

Consider, then, the following model of consumption growth for household *i* in time *t*

$$\Delta \ln c_{it} = \alpha_t + \beta \Delta \ln y_{it}^d + \Delta \varepsilon_{it}, \quad (3)$$

where *c* is consumption expenditures, α_t is a vector of time dummies capturing aggregate resources, and $\Delta \varepsilon_{it}$ is an unobserved temporary household-specific error term. The specification in equation (3) sweeps out any time invariant unobserved heterogeneity in consumption levels, and can readily admit random growth-rate heterogeneity in $\Delta \varepsilon_{it}$ (Kniesner and Ziliak 2002a). Importantly the theory of complete insurance predicts that idiosyncratic income changes do not affect consumption changes conditional on controls for aggregate resources (i.e. $\beta = 0$).[3] However, if insurance coverage is only partial, e.g. via food stamps, then, *a priori*, we would not expect $\beta = 0$.

Equation (3) yields estimates of the impact of income growth on consumption growth. For the purposes of stabilization policy we need to identify how food stamps affect the variance of consumption growth (akin to equation (2) for income volatility). In what follows, we set $\alpha = 0 = \Delta \varepsilon_{it}$. This nets out the effects of group insurance and random shocks or measurement errors, and, by setting $\alpha = 0$ we adjust the scale of insurance but we do not alter the relative

contributions of food stamps across households or over time. The variance of consumption growth is then defined as

(4) $Var(\Delta \ln c_{it}) = \beta^2 Var(\Delta \ln y_{it}^d)$.

With an estimate of β we can ascertain how food stamps reduce the variability of consumption changes after we substitute for the connection between the variation in disposable income and food stamps.

After taking the natural log of disposable income, first differencing, and noting that the log of 1 plus a small number is approximately the small number the variance decomposition is expressed as

(5) $Var(\Delta \ln c_{it}) \approx \beta^2 \{Var(\Delta \ln y_{it}) + Var(\Delta g_{it}) + 2Cov(\Delta \ln y_{it}, \Delta g_{it})\}$.

In equation (5) the key component for stabilization is the covariance term between log income changes and changes in the average food stamp transfer rate. Because food stamp benefits rise when income falls, this covariance should be negative and thus consumption should be less volatile with than without food stamps. Likewise, provided that $0 \leq \beta < 1$ then consumption overall will be less volatile than income overall.[4]

In order to implement equation (5) we require an estimate of β and estimated income and food stamp transfer rate variances and covariances. Because income changes are likely to be measured with error we obtain estimates of $\hat{\beta}$ from equation (3) via an instrumental variables estimator.[5] We construct estimates of the variance of $\Delta \ln y_{it}$ using equation (2), and for the estimated variance of Δg_{it} we run models akin to the income regressions but replace the dependent variable with Δg_{it}. Finally, using the residuals from the latter regressions we construct the covariance between non food stamp disposable income and the average food stamp

transfer rate. We identify the importance of food stamp benefits in consumption stabilization by examining the decomposition in (5) with and without food stamps.

IV. Data

Our data come from the Panel Study of Income Dynamics (PSID) for interview years 1980–1999 (calendar years 1979–1998).[6] The survey has followed a core set of households since 1968 plus newly formed households as members of the original core have split off into new families. Following the 1997 survey year the PSID began interviewing households every other year; thus, there are no data for the 1997 calendar year. The PSID is advantageous because it contains detailed information on income and household composition. Our sample spans the major recent income tax reforms in the United States, which occurred in 1981, 1986, 1990, 1993, and 1997, as well as state (1992–1996) and federal (PRWORA) welfare reforms.

The sample we use is an unbalanced panel treating missing observations as random events. By eliminating only a missing person year of data, the time series for each household can be of different length within 1980–1999. To be included in the sample the household head must (1) be in the sample at least three years, (2) be at least 25 years old in 1980, and (3) not be a student, permanently disabled, or institutionalized. To further reduce the influence of possible outliers we follow the existing literature and delete person-years with more than a 300 percent increase or more than a 75 percent decrease in consumption and family income. We also require annual food expenditures (inclusive of food stamps) to be no less than $520 and annual family income to be no less than $1,000. With our basic sample filters ((1)–(3) above) we obtain 8,485 households over the 19-year sample. After imposing these filters, dropping households with missing data, and by requiring households to be present for at least three years, we retain a maximum of 59,088 household-years for the analysis.

To estimate the effect of food stamp benefits on income and consumption volatility we define the relevant populations of interest who are likely to be affected by food stamp policies. To this end, we consider several alternatives to the pooled sample of all families. These alternatives are based on the 'risk' of taking up food stamps and include families whose current incomes are below 130 percent of the poverty guideline (income eligible), those whose income ever fell below 130 percent of the poverty guideline (ever eligible), and those whose average family incomes fall in the first quartile of average sample income (lifetime poor).[7]

The focal variables in our models are food consumption expenditures, gross labor and capital income, taxes, transfers, and demographics. In the PSID food expenditures include (non-food stamp) food purchases eaten inside the home and food purchases eaten outside the home. To this measure we add food stamp benefits.[8] Income and food stamp benefits are available in every wave of the PSID. Unfortunately the PSID did not collect any food expenditure data except for food stamps in the 1988 and 1989 interview years, which eliminates three possible consumption changes for the model in equation (3) used in estimating $\hat{\beta}$.

Along with consumption we require data on income and demographics. We define gross income as the sum of labor earnings plus income from rent, interest, and dividends. Transfers include social insurance (Social Security, SSI, AFDC, and veteran's benefits) and private transfers (child support, alimony, and gifts from relatives). Because the main sources of transfers are income conditioned, transfer payments are one of two main components of insurance supporting disposable income and in turn consumption. The other component of consumption insurance, income taxation, needs some discussion about its calculation.

The PSID ceased collecting information on household income tax liability after the 1991 interview year. Hence we approximate the income tax liability via several steps. First, using a

method derived by MaCurdy, Green, and Paarsch (1990) and implemented by Ziliak and Kniesner (1999), we approximate federal income tax payments with a smooth cubic polynomial in taxable income. The idea is to act *as if* the household faces a smooth tax function rather than a piecewise-linear function and then approximate the marginal tax rate. Because the marginal tax rate is a smooth and continuously differentiable function of taxable income we can integrate the function back to obtain total tax payments. From total federal tax payments we net out the imputed Earned Income Tax Credit for each year (assuming a 100 percent take-up rate) and add in FICA (payroll) taxes and the relevant state income tax payments, which for tractability we take as a proportional tax on income with the tax rate determined by the average income tax rate in the state (U.S. State Government Tax Collections, 1980–1999 Tax Years).[9]

V. Results

Before turning to the question of the effect of food stamp benefits on food consumption, we first consider how food stamp benefits influence income volatility via equation (2). To estimate changes in the residual income variance we control for a host of demographics (i.e. the x_{it}) that may affect income growth. These controls include family size, number of children, age of the youngest child, marital status, level of education of the head, race of the head, five-year birth cohort of the head, head's self-employment status, union status, health status, industry, and occupation. We also control for state-specific variables such as the unemployment rate, the growth rate in Gross State Product, indicator variables for the party affiliations of the governor and the state legislature, indicators for the implementation dates of AFDC/TANF welfare reform, indicators for region of country, and year fixed effects. Appendix Tables 1 and 2 contain parameter estimates from the income growth models without and with fixed effects.

A. The Food Stamp Program and Income Volatility

In Figure 2 we present changes in income volatility for the years 1980 to 1998. As described in the Data Section, we present results for a variety of samples based on the ex ante risk of food stamp participation—(1) all households, (2) households with current income less than 130 percent of the poverty line, (3) households whose income ever fell below 130 percent of the poverty line, and (4) households with average income in the first quartile. While we estimate our models with and without fixed effects, in the interest of simplicity we only report the fixed effects models in the figures although both are included in the tables.

[Figure 2 here]

As seen in Figure 2, higher income households had lower levels of income volatility than lower-income households. The highest levels of income volatility were for ever-income eligible families (i.e. families with incomes below 130 percent of the poverty line at some time during the sample period) and for the lifetime poor. Income volatility rose in the early to mid 1980s and then declined for most of the samples until the decade's end. Despite different samples and empirical models, these patterns are broadly consistent with those documented in Gottschalk and Moffitt (1994) and Dynarski and Gruber (1997). Gottschalk and Moffitt focus on the wages and salaries of white male heads of household and their sample ends in 1987 and Dynarski and Gruber focus on total labor earnings of all male heads regardless of race and their sample ends in 1991. We examine both male and female household heads; model income more broadly to include labor earnings, capital income, taxes, and transfers; and follow our sample until 1998.

From 1990 until 1993 (from 1991 for the income eligible sample), there was a marked increase in income volatility across all our samples. This surge in residual income volatility in the early 1990s is notable because by most measures the recession of 1990–1991 was relatively

mild, especially in comparison to the early 1980s recession. Moreover, since the typical poor family earns no capital income, the increase in volatility among poor families is most likely coming out of the labor market. Importantly, these years were also different for another reason – both food stamp and AFDC caseloads rose over 30 percent. Plausibly, this higher income volatility contributed to rising caseloads in the early 1990s. After 1993, there was a two-year reduction in income volatility followed by another mild increase after 1995.

[Table 2 here]

In an effort to reduce income volatility, families may choose to enter assistance programs, including the Food Stamp Program. In Table 2 we record the average percent reduction in income volatility over the 1980–1998 period due to food stamps for the models with and without fixed effects. As documented in Table 2, on average food stamps lower income volatility across all families by about 3 percent, but this reduction is upward of 12 percent among the income eligible. In other words, the insurance value of food stamps is greatest for those most in need (as defined by income) of food assistance benefits.

[Figure 3 here]

These averages, however, mask the distinct changes taking place over this time period in the Food Stamp Program's role as an income stabilizer. In Figure 3 we report the percent decline in income volatility due to food stamp benefits over the 1980s and 1990s. From the figure it is clear that food stamps reduce the level of volatility, especially for the income eligible sample. For example, among income eligible families in the early 1980s the Food Stamp Program reduced income volatility by upwards of 19 percent, but in the early 1990s, just when income volatility and program participation surged, food stamps became less effective in smoothing income, reducing the transitory variance by only 5–10 percent, and as low as 2.5 percent in 1994.

While there was a temporary rebound just prior to PRWORA in the effectiveness of food stamps the program clearly is not as important as an income stabilizer at the end of the 1990s relative to the early 1980s.

B. The Food Stamp Program and Food Consumption Volatility

Food stamps lead to a reduction in income volatility, especially for the primary intended recipients of food stamps. We now assess the role of food stamps as a stabilizer of food consumption. A key input in the variance decomposition of equation (5) is an estimate of $\hat{\beta}$ from equation (3), which reflects the extent to which consumption changes in response to income changes. In Table 3 we record instrumental variables estimates of income changes on (real) food consumption changes. In addition to the log income change and time dummies the empirical consumption model controls for changes in family size, the number of children, the age of the youngest child, and marital status, the level of education of the head, the race of the head, and the five-year birth cohort of the head. For clarity of presentation we suppress the latter variables and only record the point estimates associated with the income change. As instruments for the income change we use time (t-1) levels of the head's annual hours of work, after-tax hourly wage, self-employment status, health status, union status, home-ownership status, industry, occupation, and region of country, as well as the time t state-level variables capturing the party affiliation of the governor, the party affiliation of both houses of the legislature, the real maximum AFDC/Food Stamp benefit, the unemployment rate, the growth rate of the state's GSP, the food stamp error rate (the amount of overpayment and underpayment of food stamps), and indicators for the year the state's welfare-reform waiver or TANF program was implemented, and for the implementation of the statewide EBT program.

[Table 3 here]

As documented in Table 3, food consumption elasticities with respect to income changes range from a low of 0.047 for the lifetime poor to a high of 0.130 for all families pooled together. Relative to more broad measures of consumption used in Kniesner and Ziliak (2002a) these elasticities of food consumption with respect to income are small. This is perhaps not too surprising since food is about 10 percent of total expenditures for the typical household but around 20–30 percent for the poor. Using the estimated $\hat{\beta}$ from each sample in Table 3, in Figure 4 we document food consumption volatility without food stamps. Food consumption is significantly less volatile than income. In light of the relatively small parameter estimates in Table 3, this lower volatility is not unexpected. Interestingly, while the income eligible families experience great volatility in both income and food consumption, the lifetime income poor and the ever eligible, who have high income volatility, actually have comparatively low food consumption volatility because of the very weak link between income changes and food consumption changes. On the other hand the pooled sample of all families, who had the lowest income volatility, have relatively high food consumption volatility.[10] As with income volatility, food consumption volatility did rise after 1990 although this increase is small for the ever poor and lifetime poor.

[Figure 4 here]

The second panel of Table 2 records the average percent reduction in food consumption volatility due to food stamps. Consistent with one of the targeting mechanisms of the Food Stamp Program (i.e., the inverse relation between income and benefit levels), income eligible and households with low average incomes have the largest reductions in food consumption volatility, averaging 12.2 (13.8) percent and 9.6 (9.0) percent in the models without (with) fixed effects. Noteworthy is that the average reduction in uncertainty of food consumption exceeds

that of income. This is attributable to the negative covariance between income changes and benefit changes in the variance decomposition.

[Figure 5 here]

Parallel to our results for income volatility, the reduction in food consumption volatility due to food stamps has been declining over time as depicted in Table 5. During and immediately following the recession of the early 1980s gross-income-eligible families had their food consumption stabilized by upwards of 22 percent from food stamps, and those families whose incomes were in the 1st quartile of average income smoothed consumption changes upwards of 15 percent in the same period. However, by 1993 and during the peak of consumption volatility, the variance reduction from food stamps plummeted to 5 percent and 3 percent for each group, respectively. After this low point the role of food stamps in stabilizing food consumption volatility rose to about 6–7 percent for these groups just before and after passage of PRWORA.

[Figure 6 here]

The consumption insurance offered by the Food Stamp Program fell in the 1990s relative to the 1980s. There are many possible explanations for this. We believe one of the more compelling possible reasons is the change in the take-up rate of food stamps over this time period. As seen in Table 1, the take-up rates fell substantially from the 1980s to the 1990s. As an indirect test of this conjecture, we conduct a counterfactual experiment whereby we fix the residual variance of the food stamp transfer rate and the covariance between income and food stamps at the high point of insurance (the 1981 recession year) for the gross income eligible group, but allow the variance of income to change over time. This exercise identifies how much smoothing of food consumption would have been provided by the Food Stamp program in the 1990s if incomes and benefits were as strongly correlated as they were in the early 1980s. In

terms of our models, a fall in consumption smoothing from food stamps is then attributable to some combination of declines in take-up rates and non-increases in food stamp benefits. Since the latter is a function of inflation, we believe the decline in take-up rates is the possible primary mechanism behind the fall in consumption smoothing benefits. Our results are found in Figure 6. A comparison of this figure with Figure 5 demonstrates the importance of the changing relation between benefits and income. In both figures, after 1990 there was a fall in the insurance benefits of food stamps. However, in Figure 6 this fall is markedly less pronounced, especially for the groups with higher ex-ante probabilities of receiving food stamp benefits. We believe one should ascribe at least a portion of this difference to the fall in food stamp take-up rates.

VI. Conclusion

Our results suggest that participation in the Food Stamp Program smoothes the volatility of both income and consumption. On average food stamp benefits lower the transitory variance of income changes by about 3 percent across all families over the 1980s and 1990s but these benefits smooth income upwards of 12 percent among those families with the greatest ex ante risk of entering the program. Because food stamp benefit changes are negatively correlated with income changes, the Food Stamp Program lowered food consumption volatility by almost 14 percent among the high-risk families who are currently income eligible for food stamps.

However, the average stabilizing role of food stamps masks important time series changes in the effectiveness of the program in mitigating income and consumption changes. Beginning in 1990 the influence of food stamps as a stabilizer of income and consumption changes fell by nearly two-thirds, while volatility overall increased demonstrably. This higher

variance likely stems from labor-market instability insofar as this increase is found among both current and lifetime low-income families who typically have no capital income.

Along with research on the reasons underlying this higher volatility in the early 1990s research is also needed on why the consumption smoothing benefits of food stamps diminished in the early 1990s and was only partially restored by the end of the 1990s. We believe three factors may be especially pertinent. First, in the early 1990s, there was an unexpected increase (based on previous relations between the macroeconomy and food stamp caseloads) in food stamp caseloads. Gleason, Schochet, and Moffitt (1998) showed this increase was primarily due to longer stays in the Food Stamp Program. These longer stays may have been surprising to recipients (just as they were to researchers) and, therefore, the usual smoothing role of food stamps may have changed. If the post-1996 era is back to the "usual case," the increase seen in the consumption-smoothing role of food stamps amongst the income eligible may be consistent with the results here. Second, the early 1990s was a time of rising income and food consumption volatility. This may also have been unexpected and, therefore, the usual consumption smoothing role people expected from food stamps may have correspondingly declined. Lastly, our counterfactual experiment whereby we hold fixed the covariance of income and food stamp benefits at its early 1980s level indicates that part of the decline in consumption smoothing in the 1990s is from the secular decline in food stamp take up rates in the PSID.

Another issue implicitly raised by our paper is also worth pursuing. We demonstrated the consumption smoothing benefits of the Food Stamp Program, but there remain a large number of non-participating eligible households. Depending on the method of estimation, between 40 and 60 percent of eligible households do not participate. For some households, the inverse relationship between food stamp benefits and income may be a deterrent insofar as low benefit

levels may not be sufficient to overcome the transaction and stigma costs associated with food stamps. The 30 percent participation rate for households with incomes between 100 and 130 percent of the poverty line is consistent with this explanation (Castner and Cody, 1999, Table III.6). Even if these households were to participate the increase in food stamps' consumption smoothing role is likely to be small due to the low benefit levels. There remain, however, many households who would receive high benefits and still choose not to participate. The reasons for this choice and the alternative methods they may (or may not) use to smooth consumption are worth pursuing. This research is especially relevant in light of the rather dramatic decline in participation in the Food Stamp Program when, due to increased income volatility, we may have expected just the opposite.

In distinction to the declining use of food stamps as a consumption smoothing mechanism, recent research has demonstrated the increased importance of the income tax code (i.e. the combined federal income tax, the EITC, the payroll tax, and the state income tax) in the late 1980s and early 1990s (Kniesner and Ziliak 2002b). Part of this is due to the sizable expansions in the EITC and the payroll tax rate and base, and as demonstrated here part is due to reduced effectiveness of an important income-transfer program. With the contraction of the welfare state emanating from the 1996 welfare reform, income transfers overall are a less readily available channel of income insurance. Because the Food Stamp Program is the remaining entitlement in the social safety net, it is likely to increase in importance as an income and consumption stabilizer within the pool of means-tested transfers. The results of this paper, however, indicate that programs and policies in addition to food stamps are necessary to smooth incomes and, in turn, consumption among vulnerable low-income families.

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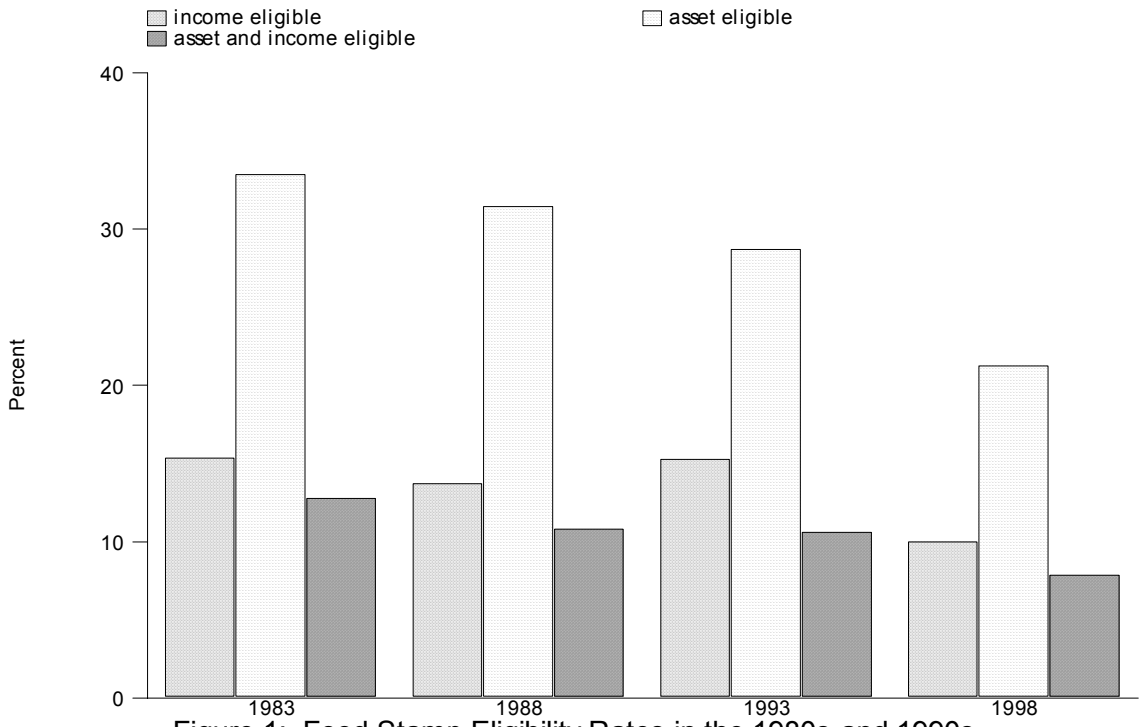

Figure 1: Food Stamp Eligibility Rates in the 1980s and 1990s

Figure 2. Income Volatility without Food Stamps

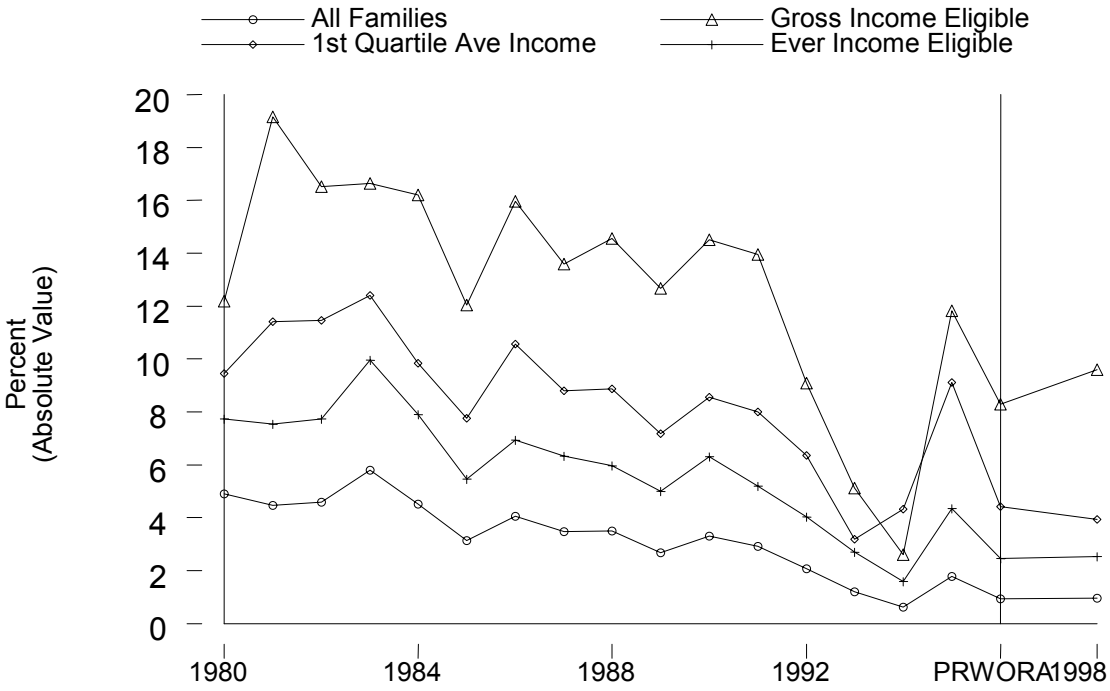

Figure 3. Reduction in Income Volatility due to Food Stamps

Figure 4. Food Consumption Volatility without Food Stamps

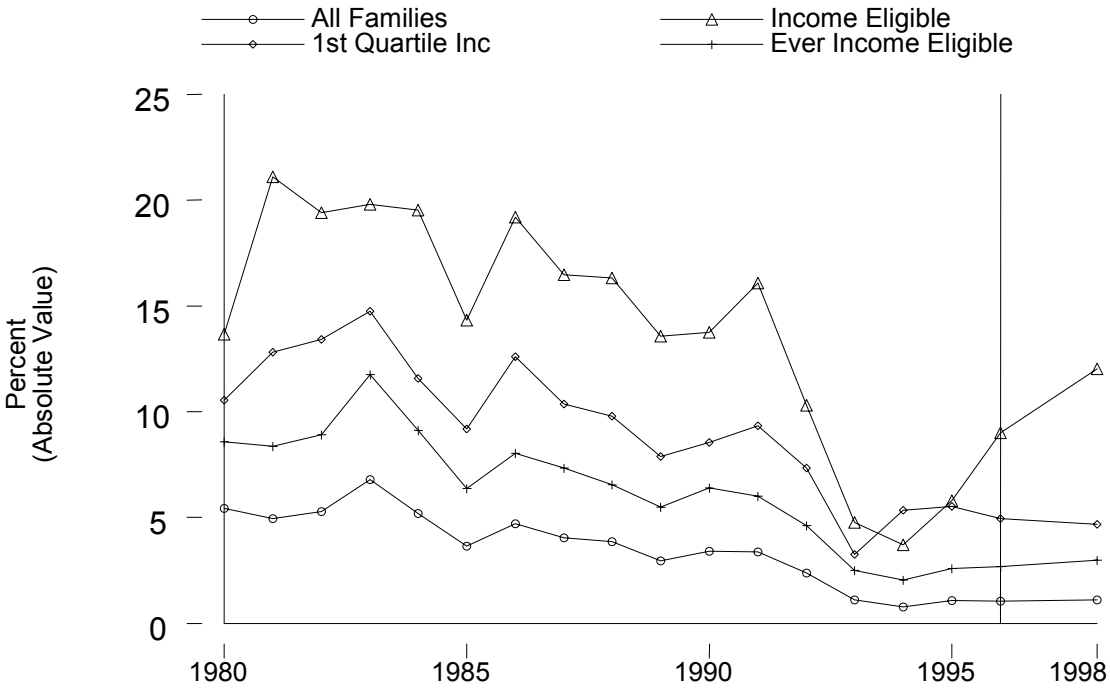

Figure 5. Reduction in Food Consumption Volatility from Food Stamps

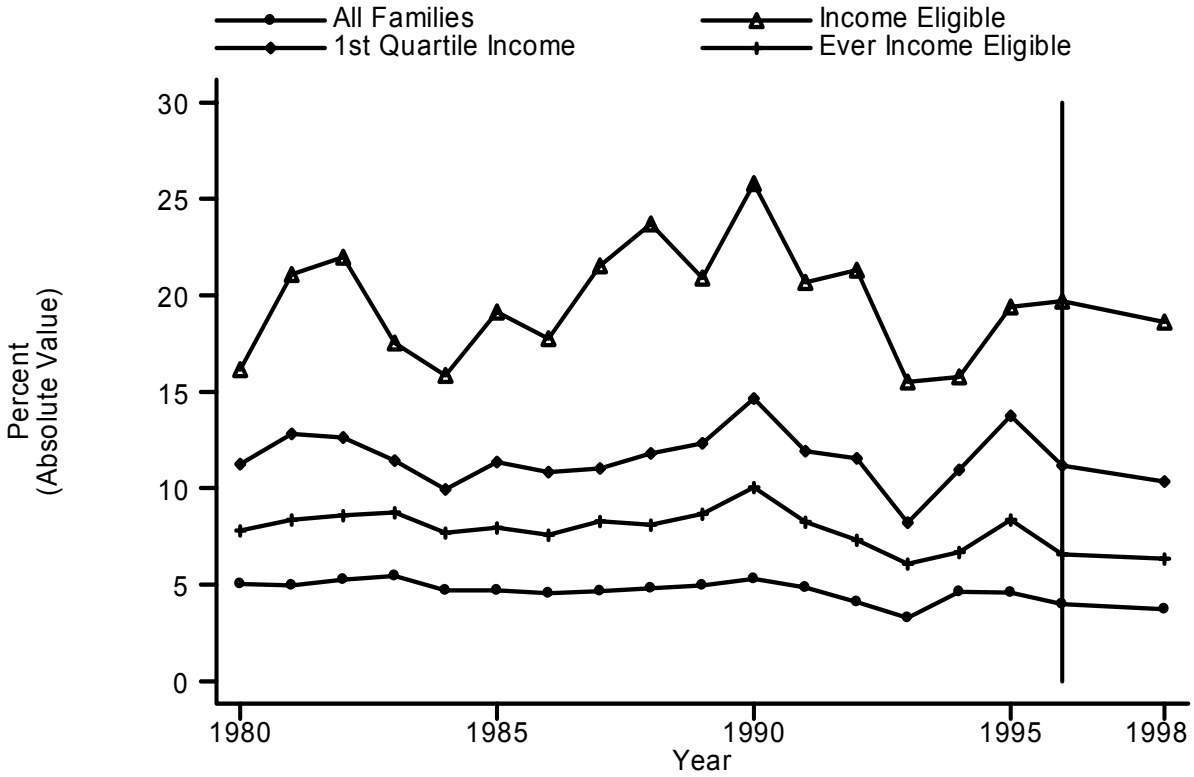

Figure 6. Counterfactual Reduction in Food Consumption Volatility

Table 1: Food Stamp Participation Rates and Average Food Stamp Transfer Rates
in the 1980s and 1990s by Eligibility Criteria

	1983	1988	1993	1998
All Families				
Food stamp participation rate (%)	7.22	6.03	3.40	2.01
Food stamps as a share of income (%)	0.88	0.80	0.51	0.18
Food stamps as a share of transfer income (%)	3.27	2.37	1.86	1.08
Number of observations	3018	3529	2583	1685
Income Less than 130 Percent of the Poverty Line				
Food stamp participation rate (%)	40.88	36.34	23.71	21.05
Food stamps as a share of income (%)	5.98	5.76	4.02	2.29
Food stamps as a share of transfer income (%)	17.74	14.13	13.57	12.14
Number of observations	406	454	312	114
Income Less than 200 Percent of the Poverty Line				
Food stamp participation rate (%)	24.43	22.13	14.09	10.54
Food stamps as a share of income (%)	3.25	3.18	2.20	1.09
Food stamps as a share of transfer income (%)	10.83	8.43	7.58	5.70
Number of observations	798	872	589	256
Income Less than 130 Percent of the Poverty Line and Assets Less than Asset Limits				
Food stamp participation rate (%)	45.64	42.01	31.22	26.13
Food stamps as a share of income (%)	6.78	6.82	5.27	2.95
Food stamps as a share of transfer income (%)	19.85	15.91	17.87	14.60
Number of observations	333	357	221	88
Income Less than 130 Percent of the Poverty Line in at Least One Year				
Food stamp participation rate (%)	19.74	16.01	10.64	7.48
Food stamps as a share of income (%)	2.53	2.21	1.70	0.74
Food stamps as a share of transfer income (%)	8.85	6.27	5.81	4.01
Number of observations	1038	1274	761	401
Average Income in Bottom Quartile				
Food stamp participation rate (%)	23.40	21.19	15.38	11.29
Food stamps as a share of income (%)	3.34	3.20	2.38	1.14
Food stamps as a share of transfer income (%)	9.51	8.03	8.56	6.43
Number of observations	658	835	481	239
Food Stamp Participants in at Least One Year				
Food stamp participation rate (%)	34.38	27.44	19.13	15.11
Food stamps as a share of income (%)	4.19	3.65	2.87	1.41
Food stamps as a share of transfer income (%)	15.58	10.80	10.46	8.14
Number of observations	634	776	460	225

Table 2: Average Percent Reduction in Income Volatility and Food Consumption Volatility due to Food Stamps 1980–1998

	All Families	Income Eligible Families	Ever Income Eligible Families	Families with Average Income in the First Quartile
	Income Volatility			
Without Fixed Effects	3.34	11.09	5.99	8.62
With Fixed Effects	3.05	12.47	5.54	8.09
	Food Consumption Volatility			
Without Fixed Effects	3.72	12.21	6.63	9.55
With Fixed Effects	3.39	13.82	6.13	8.99

Table 3: Instrumental Variables Estimates of the Effect of Log Income Changes On Log Food Consumption Changes

	All Families	Income Eligible Families	Ever Income Eligible Families	Families with Average Income in the First Quartile
Change in Disposable Income	0.130 (0.043)	0.109 (0.045)	0.054 (0.050)	0.047 (0.063)

Notes: Robust standard errors are in parentheses. The sample sizes are as follows: 48,462 in All Families; 6,312 in Families with Current Income Less than 130 Percent of the Poverty Line; 28,873 in Families with Imputed Assets Less than the Food Stamp Asset Limits; and 10,734 in Families with Average Income in the First Quartile.

Appendix Table 1: Estimates for Change in Income and Change in Income Plus Food Stamp Benefits: By Food Stamp Eligibility Family Type, No Fixed Effects

	All Families		Gross Income Eligible Families		Ever Income Eligible Families		Families with Average Income in the First Quartile	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Number of Kids	-0.022	-0.022	0.050	0.052	-0.017	-0.016	-0.030	-0.027
	(0.003)	(0.003)	(0.010)	(0.009)	(0.005)	(0.005)	(0.009)	(0.008)
Family Size	0.026	0.026	-0.009	-0.010	0.021	0.020	0.033	0.031
	(0.002)	(0.002)	(0.008)	(0.007)	(0.004)	(0.004)	(0.006)	(0.006)
Age of Youngest Child	0.000	0.000	0.002	0.001	0.001	0.001	0.001	0.000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Marital Status	-0.014	-0.012	-0.060	-0.056	-0.020	-0.017	-0.026	-0.023
	(0.004)	(0.004)	(0.015)	(0.014)	(0.008)	(0.008)	(0.011)	(0.010)
Age of Household Head	-0.004	-0.004	-0.000	-0.002	-0.002	-0.002	-0.000	-0.001
	(0.001)	(0.001)	(0.004)	(0.004)	(0.002)	(0.002)	(0.003)	(0.003)
Age of Household Head Squared	0.004	0.004	0.002	0.003	0.003	0.003	0.002	0.002
	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Self-Employed	0.008	0.008	-0.094	-0.097	-0.004	-0.004	-0.032	-0.033
	(0.007)	(0.007)	(0.040)	(0.038)	(0.017)	(0.016)	(0.027)	(0.026)
Disabled	-0.001	-0.002	0.034	0.034	-0.004	-0.005	0.005	0.004
	(0.004)	(0.004)	(0.011)	(0.010)	(0.007)	(0.007)	(0.008)	(0.007)
Union	0.003	0.002	0.000	-0.000	0.003	0.002	0.001	0.001
	(0.001)	(0.001)	(0.006)	(0.005)	(0.002)	(0.002)	(0.003)	(0.003)
Household Head is White	0.004	0.005	-0.011	-0.009	0.009	0.011	0.015	0.018
	(0.003)	(0.003)	(0.011)	(0.010)	(0.007)	(0.007)	(0.008)	(0.008)
Less than High-School Education	-0.009	-0.010	0.080	0.076	0.002	-0.001	0.014	0.011
	(0.004)	(0.004)	(0.020)	(0.019)	(0.010)	(0.009)	(0.012)	(0.012)
High-School Education	-0.010	-0.010	0.042	0.042	-0.004	-0.004	0.003	0.001
	(0.004)	(0.004)	(0.021)	(0.020)	(0.010)	(0.009)	(0.012)	(0.012)
Northeast	0.003	0.003	0.017	0.014	0.001	-0.001	-0.006	-0.009
	(0.005)	(0.005)	(0.021)	(0.020)	(0.012)	(0.012)	(0.013)	(0.013)
North-central	0.006	0.006	-0.005	-0.005	0.009	0.010	-0.007	-0.007
	(0.005)	(0.005)	(0.020)	(0.019)	(0.011)	(0.011)	(0.013)	(0.012)
South	0.009	0.008	0.045	0.040	0.022	0.020	0.017	0.015
	(0.007)	(0.006)	(0.025)	(0.024)	(0.015)	(0.015)	(0.017)	(0.016)
Occupation-Professional	0.010	0.010	0.004	-0.011	0.023	0.021	0.052	0.051
	(0.005)	(0.005)	(0.073)	(0.069)	(0.019)	(0.018)	(0.033)	(0.032)
Occupation-Managers	0.009	0.008	-0.163	-0.161	-0.004	-0.004	0.032	0.037
	(0.011)	(0.011)	(0.075)	(0.074)	(0.029)	(0.029)	(0.063)	(0.062)
Occupation-Clerical	-0.004	-0.005	-0.018	-0.029	-0.008	-0.011	0.022	0.020
	(0.005)	(0.005)	(0.048)	(0.046)	(0.017)	(0.017)	(0.026)	(0.025)
Occupation-Craftsmen	0.006	0.007	-0.087	-0.078	0.007	0.008	0.005	0.010
	(0.005)	(0.005)	(0.041)	(0.040)	(0.015)	(0.014)	(0.026)	(0.026)
Occupation-Operators	0.000	-0.000	-0.041	-0.041	-0.003	-0.004	-0.013	-0.014
	(0.005)	(0.005)	(0.039)	(0.038)	(0.014)	(0.014)	(0.024)	(0.023)
Occupation-Farming	-0.024	-0.025	-0.066	-0.072	-0.053	-0.057	-0.085	-0.090
	(0.023)	(0.022)	(0.076)	(0.073)	(0.042)	(0.041)	(0.063)	(0.061)
Occupation-Services	-0.003	-0.005	0.007	0.007	-0.013	-0.015	0.006	0.004
	(0.007)	(0.007)	(0.043)	(0.042)	(0.016)	(0.016)	(0.025)	(0.024)

	All Families		Gross Income Eligible Families		Ever Income Eligible Families		Families with Average Income in the First Quartile	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Industry-Agriculture	0.033	0.032	0.073	0.071	0.065	0.065	0.090	0.091
	(0.018)	(0.018)	(0.065)	(0.062)	(0.037)	(0.036)	(0.057)	(0.055)
Industry-Mining	0.029	0.028	-0.007	-0.025	0.057	0.055	0.032	0.035
	(0.015)	(0.015)	(0.084)	(0.085)	(0.041)	(0.041)	(0.075)	(0.075)
Industry-Manufacturing	0.023	0.022	-0.001	-0.010	0.034	0.033	0.040	0.037
	(0.005)	(0.005)	(0.036)	(0.034)	(0.014)	(0.014)	(0.024)	(0.023)
Industry-Transportation	0.022	0.022	-0.008	-0.020	0.045	0.043	0.054	0.051
	(0.006)	(0.006)	(0.055)	(0.053)	(0.017)	(0.017)	(0.031)	(0.030)
Industry-Wholesale	0.017	0.017	-0.037	-0.039	0.029	0.028	0.017	0.015
	(0.006)	(0.006)	(0.037)	(0.035)	(0.015)	(0.015)	(0.024)	(0.023)
Industry-FIRE	0.034	0.034	-0.007	-0.031	0.074	0.071	0.051	0.044
	(0.008)	(0.008)	(0.068)	(0.062)	(0.024)	(0.023)	(0.034)	(0.032)
Industry-Business/Repair	0.015	0.014	-0.033	-0.041	0.026	0.023	0.020	0.017
	(0.009)	(0.009)	(0.051)	(0.049)	(0.022)	(0.021)	(0.036)	(0.035)
Industry-Personal Services	0.016	0.017	-0.003	-0.002	0.022	0.024	0.013	0.014
	(0.012)	(0.012)	(0.042)	(0.040)	(0.021)	(0.020)	(0.027)	(0.026)
Industry-Entertainment	0.030	0.030	0.159	0.158	0.059	0.061	0.045	0.042
	(0.018)	(0.017)	(0.084)	(0.084)	(0.045)	(0.045)	(0.054)	(0.054)
Industry-Professional	0.029	0.028	-0.029	-0.037	0.043	0.042	0.033	0.031
	(0.006)	(0.006)	(0.042)	(0.040)	(0.016)	(0.016)	(0.025)	(0.024)
Industry-Public Administration	0.033	0.033	0.083	0.060	0.062	0.061	0.053	0.045
	(0.006)	(0.006)	(0.069)	(0.066)	(0.019)	(0.019)	(0.036)	(0.035)
Governor is a Democrat	-0.024	-0.023	-0.081	-0.078	-0.068	-0.064	-0.046	-0.041
	(0.013)	(0.012)	(0.046)	(0.044)	(0.029)	(0.028)	(0.033)	(0.031)
Both State Houses Democrat	0.005	0.005	0.008	0.006	0.014	0.012	0.010	0.008
	(0.004)	(0.004)	(0.016)	(0.015)	(0.009)	(0.009)	(0.011)	(0.011)
Both State Houses Republican	0.025	0.026	0.011	0.014	0.032	0.033	0.034	0.038
	(0.017)	(0.017)	(0.071)	(0.065)	(0.041)	(0.040)	(0.048)	(0.045)
Real State Maximum AFDC and	0.000	0.000	-0.000	-0.000	0.000	0.000	0.000	0.000
Food Stamp Benefit Levels	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Unemployment rate	-0.002	-0.002	-0.000	0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Gross State Product	0.256	0.246	0.091	0.047	0.330	0.303	0.196	0.159
	(0.063)	(0.061)	(0.208)	(0.196)	(0.125)	(0.121)	(0.145)	(0.139)
Waiver for AFDC/TANF	0.005	0.004	0.042	0.031	0.046	0.042	0.067	0.062
	(0.008)	(0.008)	(0.042)	(0.041)	(0.023)	(0.022)	(0.027)	(0.026)
Head Born After 1956	0.019	0.017	0.077	0.056	0.035	0.026	0.038	0.020
	(0.011)	(0.011)	(0.046)	(0.043)	(0.029)	(0.028)	(0.036)	(0.034)
Head Born 1946–1955	0.014	0.013	0.046	0.039	0.032	0.030	0.035	0.029
	(0.006)	(0.005)	(0.027)	(0.025)	(0.015)	(0.014)	(0.020)	(0.019)
Head Born 1926–1935	-0.008	-0.008	-0.020	-0.024	-0.012	-0.011	-0.018	-0.018
	(0.007)	(0.007)	(0.028)	(0.027)	(0.015)	(0.015)	(0.020)	(0.019)
Head Born 1916–1925	-0.002	-0.001	0.019	0.017	-0.012	-0.009	-0.015	-0.010
	(0.011)	(0.011)	(0.037)	(0.035)	(0.022)	(0.021)	(0.025)	(0.024)
Head Born Before 1915	0.005	0.007	0.040	0.039	-0.011	-0.006	-0.024	-0.018
	(0.016)	(0.016)	(0.046)	(0.044)	(0.030)	(0.029)	(0.033)	(0.031)

Notes: Standard errors are in parentheses. Income in column (1) does not contain food stamps while income in column (2) does contain food stamps. The sample sizes are as follows: 59,088 in All Families; 7,716 in Families with Current Income Less than 130 Percent of the Poverty Line; 34,997 in Families with Imputed Assets Less than the Food Stamp Asset Limits; and 13,246 in Families with Average Income in the First Quartile.

Appendix Table 2: Estimates for Change in Income and Change in Income Plus Food Stamp Benefits: By Food Stamp Eligibility Family Type, Fixed Effects

	All Families		Gross Income Eligible Families		Ever Income Eligible Families		Families with Average Income in the First Quartile	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Number of Kids	-0.044	-0.043	-0.016	-0.007	-0.041	-0.038	-0.057	-0.048
	(0.004)	(0.004)	(0.015)	(0.014)	(0.008)	(0.008)	(0.012)	(0.011)
Family Size	0.055	0.056	0.061	0.058	0.049	0.049	0.066	0.064
	(0.003)	(0.003)	(0.012)	(0.011)	(0.006)	(0.006)	(0.009)	(0.008)
Age of Youngest Child	0.001	0.001	0.007	0.006	0.003	0.003	0.003	0.003
	(0.000)	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Marital Status	0.008	0.006	0.019	0.012	-0.003	-0.007	-0.005	-0.009
	(0.009)	(0.009)	(0.042)	(0.039)	(0.020)	(0.019)	(0.027)	(0.026)
Age of Household Head	-0.003	-0.003	-0.006	-0.008	0.002	0.002	0.001	0.000
	(0.004)	(0.004)	(0.011)	(0.011)	(0.007)	(0.007)	(0.009)	(0.008)
Age of Household Head Squared	0.007	0.007	0.012	0.013	0.005	0.005	0.004	0.004
	(0.001)	(0.001)	(0.005)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
Self-Employed	0.007	0.005	-0.071	-0.078	0.003	-0.001	-0.043	-0.050
	(0.010)	(0.009)	(0.048)	(0.045)	(0.022)	(0.021)	(0.031)	(0.029)
Disabled	-0.004	-0.005	0.011	0.010	-0.008	-0.010	0.005	0.003
	(0.005)	(0.005)	(0.016)	(0.015)	(0.010)	(0.010)	(0.011)	(0.011)
Union	0.003	0.002	-0.010	-0.009	0.003	0.002	0.000	-0.000
	(0.001)	(0.001)	(0.007)	(0.006)	(0.003)	(0.003)	(0.004)	(0.004)
Northeast	-0.035	-0.037	0.113	0.023	-0.092	-0.099	-0.106	-0.121
	(0.025)	(0.024)	(0.182)	(0.170)	(0.061)	(0.059)	(0.091)	(0.087)
North-central	0.012	0.013	0.057	0.056	0.007	0.014	-0.056	-0.051
	(0.020)	(0.020)	(0.140)	(0.130)	(0.052)	(0.051)	(0.073)	(0.070)
South	0.001	0.001	0.309	0.286	0.024	0.027	-0.040	-0.035
	(0.021)	(0.021)	(0.141)	(0.131)	(0.054)	(0.052)	(0.071)	(0.068)
Occupation-Professional	0.004	0.004	0.004	-0.033	0.006	0.005	0.031	0.033
	(0.009)	(0.009)	(0.104)	(0.097)	(0.030)	(0.030)	(0.048)	(0.046)
Occupation-Managers	0.015	0.015	-0.037	-0.057	0.008	0.005	0.084	0.084
	(0.013)	(0.013)	(0.087)	(0.081)	(0.033)	(0.032)	(0.064)	(0.061)
Occupation-Clerical	-0.004	-0.005	-0.030	-0.050	-0.018	-0.020	0.011	0.010
	(0.009)	(0.008)	(0.061)	(0.057)	(0.023)	(0.023)	(0.034)	(0.032)
Occupation-Craftsmen	0.023	0.023	-0.023	-0.030	0.044	0.042	0.028	0.025
	(0.008)	(0.008)	(0.058)	(0.054)	(0.023)	(0.022)	(0.036)	(0.035)
Occupation-Operators	0.007	0.004	-0.055	-0.073	0.008	0.002	-0.006	-0.016
	(0.009)	(0.009)	(0.056)	(0.052)	(0.022)	(0.021)	(0.033)	(0.032)
Occupation-Farming	-0.026	-0.026	0.081	0.079	-0.035	-0.035	-0.045	-0.050
	(0.031)	(0.030)	(0.115)	(0.107)	(0.055)	(0.054)	(0.079)	(0.076)
Occupation-Services	-0.008	-0.010	-0.020	-0.034	-0.021	-0.024	0.012	0.007
	(0.011)	(0.011)	(0.058)	(0.054)	(0.024)	(0.024)	(0.034)	(0.032)
Industry-Agriculture	0.024	0.023	0.019	0.022	0.056	0.055	0.104	0.108
	(0.024)	(0.024)	(0.098)	(0.091)	(0.047)	(0.045)	(0.067)	(0.064)
Industry-Mining	0.074	0.072	0.100	0.078	0.092	0.087	0.157	0.156
	(0.027)	(0.027)	(0.189)	(0.176)	(0.080)	(0.077)	(0.164)	(0.157)

	All Families		Gross Income Eligible Families		Ever Income Eligible Families		Families with Average Income in the First Quartile	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Industry-Manufacturing	0.050	0.048	0.120	0.112	0.057	0.054	0.066	0.063
	(0.010)	(0.009)	(0.054)	(0.051)	(0.023)	(0.022)	(0.036)	(0.034)
Industry-Transportation	0.043	0.041	0.182	0.161	0.080	0.076	0.125	0.115
	(0.012)	(0.012)	(0.084)	(0.078)	(0.029)	(0.028)	(0.053)	(0.050)
Industry-Wholesale	0.041	0.040	0.052	0.053	0.054	0.054	0.047	0.046
	(0.010)	(0.010)	(0.053)	(0.049)	(0.023)	(0.022)	(0.034)	(0.032)
Industry-FIRE	0.059	0.056	0.137	0.089	0.139	0.131	0.073	0.061
	(0.015)	(0.015)	(0.094)	(0.087)	(0.036)	(0.035)	(0.051)	(0.048)
Industry-Business/Repair	0.040	0.038	0.071	0.059	0.066	0.061	0.041	0.036
	(0.012)	(0.012)	(0.065)	(0.060)	(0.029)	(0.029)	(0.043)	(0.041)
Industry-Personal Services	0.036	0.036	0.085	0.086	0.047	0.049	0.024	0.026
	(0.016)	(0.016)	(0.059)	(0.055)	(0.030)	(0.029)	(0.038)	(0.037)
Industry-Entertainment	0.065	0.064	0.322	0.315	0.156	0.157	0.163	0.160
	(0.026)	(0.026)	(0.127)	(0.118)	(0.056)	(0.054)	(0.081)	(0.078)
Industry-Professional	0.056	0.054	0.115	0.108	0.079	0.074	0.072	0.066
	(0.011)	(0.011)	(0.059)	(0.055)	(0.026)	(0.025)	(0.036)	(0.034)
Industry-Public Administration	0.048	0.046	0.225	0.179	0.079	0.074	0.065	0.052
	(0.013)	(0.012)	(0.086)	(0.080)	(0.031)	(0.030)	(0.050)	(0.047)
Governor is a Democrat	-0.016	-0.013	-0.202	-0.158	-0.101	-0.092	-0.081	-0.069
	(0.023)	(0.023)	(0.113)	(0.106)	(0.054)	(0.053)	(0.070)	(0.067)
State House and Senate is Democrat	0.003	0.002	0.018	0.007	0.021	0.017	0.022	0.017
	(0.006)	(0.005)	(0.023)	(0.022)	(0.013)	(0.012)	(0.016)	(0.015)
State House and Senate is Republican	0.025	0.025	-0.014	-0.029	0.019	0.015	0.025	0.022
	(0.019)	(0.018)	(0.086)	(0.081)	(0.044)	(0.043)	(0.053)	(0.051)
Real State Maximum AFDC and Food	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Stamp Benefit Levels	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Unemployment rate(t)	-0.002	-0.002	0.000	0.001	0.000	0.001	0.000	0.001
	(0.002)	(0.001)	(0.006)	(0.005)	(0.003)	(0.003)	(0.004)	(0.004)
Gross State Product	0.251	0.242	0.214	0.143	0.336	0.313	0.184	0.151
	(0.066)	(0.064)	(0.230)	(0.214)	(0.137)	(0.133)	(0.161)	(0.154)
State had Waiver for AFDC/TANF	0.001	0.000	0.063	0.051	0.051	0.048	0.079	0.073
	(0.010)	(0.009)	(0.049)	(0.046)	(0.025)	(0.024)	(0.031)	(0.030)

Notes: Standard errors are in parentheses. Income in column (1) does not contain food stamps while Income in column (2) does contain food stamps. The sample sizes are as follows: 59,088 in All Families; 7,716 in Families with Current Income Less than 130 Percent of the Poverty Line; 34,997 in Families with Imputed Assets Less than the Food Stamp Asset Limits; and 13,246 in Families with Average Income in the First Quartile.

Endnotes

[1] Note that this is a lower participation rate than the 65 percent rate reported in Blank and Ruggles (1996, Table 1). The critical distinction is that Blank and Ruggles focus on single female heads of households while we examine participation across the much broader population of single and two-parent families with and without children.

[2] The 26 percent participation rate in 1998 is lower than expected. While some of this is due to real declines in food stamp participation by low income households, there are at least two other reasons specific to the PSID. First, in 1998, the PSID switched from an annual to a bi-annual questionnaire. This longer period of recall may have lead some households to underreport their food stamp participation status. Second, the oversampling of the low-income population was no longer conducted by the PSID. As seen in Table 1, this lead to a much lower number of households eligible for food stamps and, therefore, increased the size of the confidence interval around our estimate.

[3] For other recent work using this general framework see, e.g., Gruber (1997); Ham and Jacobs (2000); Hayashi, Altonji, and Kotlikoff (1996); Kniesner and Ziliak (2002a); and Morduch (1995).

[4] This framework can be extended to distinguish between transitory and permanent income shocks on consumption volatility. As an insurance mechanism, the Food Stamp Program does not discriminate between temporary and permanent shocks. If a household satisfies the liquid asset and vehicle value requirements they can begin drawing benefits the first day of the month following an income drop below the gross (and net) income limit; the program rules do not distinguish between these two types of shocks. Our model captures a net effect of temporary and permanent shocks. The insurance value of the program, however, may be differentially affected by temporary and permanent shocks. (See Blundell and Pistaferri (2003) in this issue.)

[5] Kniesner and Ziliak (2002a) use a forward-filter IV estimator, which is more efficient than the standard 2SLS estimator. However, 2SLS is consistent, which is all that is needed for our purposes here.

[6] We begin our sample in 1980 for two reasons: one, the PSID began collecting better tax information in 1980, and two, this is when the Food Stamp Program ended the so-called purchase requirement. (Under the purchase requirement, recipients needed to pay for a set amount of discounted food stamps with the price directly related to a household's income.)

[7] Because assets are only measured in five-year intervals in the PSID, we impute liquid assets for each year by capitalizing the sum of rent, interest, and dividend income with the 3-month U.S. Treasury T-bill rate (Ziliak and Kniesner 1999). We correctly predict food stamp asset eligibility and non-eligibility 75 percent of the time with our imputed measure when compared against actual liquid assets in 1983, 1988, 1993, and 1998.

[8] As discussed previously, the vast majority of food stamp participants are infra-marginal. Therefore, adding food stamps to cash food expenditures is a valid assumption because the percentage of households for whom this would not hold (i.e. the extra-marginal households) is small.

[9] The assumption of 100% take up in the EITC overstates actual program utilization. Scholz (1994) estimated participation in 1990 to be on the order of 85 percent; however, with increased generosity and advertisement in the 1990s it is likely higher by the end of our sample period. As shown in Kniesner and Ziliak (2002a) the smooth tax function approximates PSID generated tax payments very well and yields comparable parameter estimates of the insurance value of the U.S. federal income tax system.

[10] The weak link between income changes and food consumption changes for the lifetime poor relative to better off families, which translates into lower levels of consumption volatility, may be due in part to the presence of the consumption floor of income transfers. For inframarginal food stamps recipients, food consumption is likely stabilized by not only food stamps but also other transfers such as AFDC/TANF, unemployment insurance, and SSI. However, in results not tabulated, the link between consumption changes and income changes is significantly higher for the poor than non poor when consumption is measured with nondurable consumption or total expenditures.