The Introduction of the Food Stamp Program: Impacts on Food Consumption and Labor Supply

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Abstract

The food stamp program, serving 24 million persons in 2004 at a cost of $27 billion, is one of the most important income support programs in the United States. Despite this prominence, it has been relatively understudied as it has been difficult for researchers to isolate the causal impact of the Food Stamp Program on food spending, nutritional intake, labor supply and other outcomes. Because the program is national, there is not variation in program parameters (such as stark differences in state benefit levels or eligibility) that are typically exploited by researchers to measure program impacts. In this work, we leverage previously underutilized variation across counties in the date they originally implemented their Food Stamp Program in the 1960s and early 1970s. Using the Panel Study of Income Dynamics, we employ difference-in-difference methods to estimate the impact of program availability on food spending, labor supply and family income. Consistent with theoretical predictions, we find that the introduction of food stamps leads to a decrease in out of pocket food spending, an increase in overall food expenditures, and a decrease (although insignificant) in the propensity to take meals out. The results are quite precisely estimated for total food spending, with less precision in estimating the impacts on out of pocket food costs. We find no evidence of work disincentive impacts in the PSID, which is confirmed with an analysis of the 1960, 1970 and 1980 Census.

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I. Introduction

The Food Stamp Program (FSP) is one of the largest transfer programs for the low income population. In 2004, for example, the program cost $27 billion and served 24 million persons. This compares to $25 billion for Temporary Assistance for Needy Families and $33 billion for the Earned Income Tax Credit.

The primary goal of the food stamp program is to promote nutritional well-being of low-income persons. As such, a first order question is to understand and estimate the impact of the program on nutrition, food consumption, and health outcomes. Importantly, the food stamp benefits are structured like the standard income support program—the family receives some guaranteed benefit which is then reduced as family resources increase. Therefore, to fully evaluate the efficacy of the program, it is important to know how the program and its benefit reduction rate affect labor supply and family economic well-being.

It has been very difficult for researchers to isolate the causal impact of the FSP on food spending, nutritional intake, labor supply and other outcomes. Because the program is national, there is not variation in program parameters (such as stark differences in state benefit levels or eligibility) that are typically exploited by researchers to measure program impacts. In the absence of programmatic variation, most researchers have studied the impact of the FSP by comparing food stamp recipients with eligible non-recipients. Since we would expect participants and non-participants to differ in important – and potentially unobservable – ways, researchers have employed a variety of methods to control for selection into the program (see Fraker, 1990, for a comprehensive review of the early food stamp literature).

In general, the literature has concluded that the marginal propensity to consume food out of food stamp income is about 4 times higher than it is out of cash income. As a result, food

stamp benefits worth $100 are thought to cause about a $60 increase in food spending while a cash transfer of $100 is associated with closer to a $15 increase in food spending. But, as mentioned above, these results have been based on studies that rely on strong and untested assumptions. In addition, they are focused on the impact of the type of income, and only indirectly address the more basic policy question regarding the impact on food spending and other important outcomes of a sizeable, targeted transfer to the poor.

To measure the impact of the food stamp program in this project, we utilize an underexploited source of variation: the original introduction of the program across counties.[1] There is tremendous variation in the timing of the FSP introduction across counties in the United States—the earliest county programs were established in 1961 and the last county programs were established in 1975. The FSP started as eight county-level pilot programs and later expanded to 43 counties. This led to passage of the Food Stamp Act of 1964 which gave local areas the authority to start up FSPs in their county. This led to a steady increase in FSP adoption over the next ten years. Finally, the 1973 Amendments to the Food Stamp Act mandated that all counties offer FSP by 1975.

Our approach has the appeal of relying on non-marginal changes in incentives faced by consumers. This "program introduction" research design has been taken in recent analyses of other social programs such as Head Start (Ludwig and Miller 2006), Medicare (Finkelstein and McKnight 2005), and Title I (Cascio et al., 2006). It is also part of a larger literature examining impacts of the Great Society and Civil Rights era (for example see Almond, Chay and Greenstone 2003).

We begin by examining the determinants of the food stamp program start dates across counties. We are guided by the historical descriptions of the political landscape around the FSP.

[1] Currie and Moretti (2006) use food stamp program introduction across California counties to examine the impact of the program on birth outcomes.

Using data from the 1960 City and County Data Book, we find that earlier food stamp program introduction occurs in counties that are more urban, black, low income, and with a smaller fraction of land used in agriculture. While these county characteristics explain little of the overall variation in food stamp implementation, the results imply that food stamp introduction is not *purely* exogenous. Ignoring this could lead to spurious findings if counties that implement food stamps earlier are on a different trend than counties that implement later. We use these results to motivate the inclusion of trends interacted with county pre-treatment characteristics in our regression models.

We use data from the Panel Study of Income Dynamics (PSID) to address two important research questions. First, we use the PSID from 1968-1978 to examine the impact of the program on food consumption. Specifically, we look at expenditures on food spent at home, meals out, food stamp savings, and total food spending. Second, we examine the FSP as a traditional income support program—a guaranteed benefit combined with a program phase-out or benefit reduction rate. This structure is well known to cause a disincentive to work (Moffitt 1983). While the benefit reduction rate in food stamps is quite low compared to cash welfare programs, standard labor supply models would predict that food stamps would reduce employment and hours worked. Here, we are able to augment our main estimates from the PSID with estimates based on the 1960, 1970 and 1980 decennial censuses.[2]

We employ a basic difference-in-difference model where the treatment is at the county level and all models control for county and year fixed effects. In this model, identification requires that there are no contemporaneous county level trends that are correlated with food stamp introduction and family economic outcomes. We add several variables to the analysis to control for possible confounders. Based on our analysis of food stamp adoption we include 1960

[2] Other studies examine the impact of the FSP on health. Currie and Moretti 2006 use natality data from California to examine impacts on birth outcomes. Almond, Chay, Hoynes and Schanzenbach 2006 use data from all U.S. counties and examine the impacts on birth outcomes and infant mortality.

county characteristics interacted with time trends. Further, food stamp introduction took place during a period of great expansion in programs for the poor in the United States. To control for the possible coincident expansion of other programs such as social security, AFDC, Medicaid and Medicare, we include annual measures of *county* per capita transfer payments which we obtain from the Bureau of Economics Analysis Regional Economic Information System. Finally, we explore the sensitivity to controls for state linear time trends, state-year unrestricted fixed effects and family fixed effects. We present many specification tests.

Overall, our results are quite consistent with the theoretical predictions. We find that the introduction of food stamps leads to a decrease in out of pocket food spending, an increase in overall food expenditures, and a decrease (although insignificant) in the propensity to take meals out. The results are quite precisely estimated for total food spending, with less precision in estimating the impacts on out of pocket food costs. The magnitude of our results is consistent with the earlier literature—in particular we find evidence that the marginal propensity to consume out of food stamp income is larger than the marginal propensity to consume out of cash income. While the point estimates are generally in the direction of a negative work disincentive, we find no statistically significant evidence that the introduction of the food stamp program led to reductions in work, earnings, or family income. This is confirmed with an analysis of the 1960, 1970 and 1980 Census.

The remainder of the paper proceeds as follows. Section II presents a history of the food stamp program. Section III discusses the expected effects of the program and Section IV reviews the existing literature. Section V describes the data and Section VI presents the methodology. Sections VII and VIII present our results and Section IX concludes.

II. Introduction of Food Stamp Program

The origins of the modern Food Stamp Program began in 1961 with President Kennedy's first executive order establishing eight county-level pilot programs.[3] The pilot programs were later expanded to 43 counties in 1962 and 1963. The success with these pilot programs led to the Food Stamp Act of 1964 (FSA). The FSA gave local areas the authority to start up Food Stamp Programs (FSP) in their county. As with the current FSP, the program was federally funded and benefit levels did not vary across areas. In the period following the passage of the FSA, there was a steady stream of counties initiating food stamp programs. Support for requiring food stamp programs grew due to a national spotlight on hunger (Berry 1984). This interest culminated in passage of 1973 Amendments to the Food Stamp Act, which mandated that all counties offer FSP by 1975.

It is important to understand the political context in which the FSP was introduced in the U.S. Prior to the modern day FSP, most counties provided food aid through a commodity distribution program (CDP). The main goal of the CDP was to support farm prices and farm income by removing surplus commodities from the market. It was seen, however, as inadequate to promote the nutritional well-being of low income persons because of the limited range of products and infrequent timing of the distribution of goods. Consequently, debate about moving from the CDP to the FSP pitted powerful agricultural interests against advocates for the poor (MacDonald 1977, Berry 1984). In fact, as described in Berry (1984), passage of the 1964 Food Stamp Act was achieved through classic legislative logrolling. The farm interest coalition (Southern Democrats, Republicans) wanted to pass an important cotton-wheat subsidy bill while advocates for the poor (Northern Democrats) wanted to pass the FSA. Neither had majorities, yet they combined forces, supported each others bills, and both bills passed.

[3] This section is based on Berry (1984) and MacDonald (1977).

This political history is important because it illustrates that there was significant heterogeneity across the country in support for the FSP. Remember that the 1964 Act allowed for counties to voluntarily set up food stamp programs. The above discussion suggests that counties with strong support for farming interests may adopt FSP later in the period while those with strong support for the low income population may adopt FSP earlier in the period. Consequently, the food stamp program introduction may not be completely exogenous. We return to this below.

Figure 1 summarizes the overall pattern of FSP introduction. In particular, the figure plots the percent of counties offering FSP, where the counties are weighted by their 1970 population. Note this is NOT the food stamp caseload, but represents the percent of the national population that lived in an area offering a FSP. The figure shows that there was a long ramp up period between 1964 and 1975, leading to the eventual universal coverage of the FSP. For example in 1968 about half of the population lived in counties with FSP and by 1972 this rose to over 80 percent. It is this ramp up period that forms the basis of our research design.[4]

Figure 2 compares the average monthly caseloads in the FSP to the CDP. As more counties replaced their commodity programs with the food stamp program, the food stamp caseload grew quickly. The commodity caseload seemed to fall more slowly. Theoretically, counties were not supposed to have both FSP and CDP in place at the same time, but in practice some places did offer both, while others offered neither. In 1967, for example 35 percent of counties (not population-weighted) offered neither FSP nor CDP. Commodity distribution programs were offered by 38 percent of counties, and food stamps were offered by 21 percent. The remaining 6 percent of counties offered both at the same time.

[4] The source for county level start dates are USDA annual reports on food stamp caseloads by county. See USDA (various years).

It is important to understand the CDP program in order to interpret the magnitude of the FSP effects. For example, if all food stamp recipients simply moved over from receiving an equal amount of commodities, we would not expect to find any impact of the FSP on consumption. On the other hand, if counties adopting FSP did not previously have access to CDP, the estimated coefficients would pick up the full effect of the introduction of the program. In practice, the CDP provided a very narrow set of commodities--the most frequently available commodities were flour, cornmeal, rice, dried milk, cheese, butter (add citation for this). Further, the commodities were distributed infrequently. Consequently, prior research has concluded that the FSP program, in its ability to purchase a wide variety of food including fresh meat and vegetables, represented an important increase in the quality and quantity of food in comparison over the CDP (add citation for this).

To get more insight into the geographic variation in the ramp-up to a universal FSP, Figure 3 shows the timing of food stamp introduction by county. In the figure, the shading of the counties is assigned by county FSP start up date—with darker shading denoting an earlier start up date. This shows a great deal of variation in FSP introduction within and across states. Our basic identification strategy uses this county level variation in food stamp "treatment."

To further explore the degree of *within state* variation in FSP start dates, Figure 4 presents FSP coverage rates by state for 1961-1975. This figure, as in Figure 1, plots the percent of the population (in this case in the state) that lives in a county offering food stamps. In some states, such as Nevada, Utah, Colorado, Massachusetts, and Florida, there was little or no within state variation in food stamp start dates. Other states such as California, New Mexico, and Minnesota have much greater within state variation in the food stamp start dates. The figure shows that in most states, the county level food stamp introduction took place in a narrower period than for the country as a whole.

As discussed above, the 1964 FSA allowed counties to start FSP—but it was voluntary. Therefore, for our research design to be valid, we need for the assignment of county start up of FSP to be exogenous. The discussion above suggests that northern, urban counties with large poor populations were more likely to adopt food stamp programs earlier while southern, rural counties with strong agricultural interests adopted food stamps later. This systematic variation in food stamp adoption could lead to spurious estimates of the program impact if those same county characteristics are associated with differential trends in the outcome variables.

To explore this we compiled characteristics of counties in 1960, on the eve of the first food stamp pilot programs. We use these "pre" characteristics to predict the date that the county adopted a food stamp program. The data on county characteristics comes from the 1960 City and County Data Book, which is based on data from the 1960 Census and the Census of Agriculture. The dependent variable is the county food stamp start date—expressed as an index equal to 1 in January 1961. We drop from the analysis the initial pilot counties as they were chosen by a different process than the later counties.[5] Therefore the dependent variable ranges from 25 (January 1963) to 175 (July 1975). The independent variables include the percent of the population that lives in an urban area, is black, is less than 5, is 65 or over, has income less than $3,000 (1959$), and the percent of land in the county that is farmland. Descriptive statistics for this data are provided in Appendix Table 1.[6]

The results are presented in Table 1. We present estimates with (columns 2 and 3) and without (column 1) state fixed effects. All regressions are weighted by the county population. Focusing on the results with state fixed effects, we find that counties with larger urban, black, and low income populations implement FSPs earlier. Further, those with a larger share of the

[5] The results are very similar if we include the pilot counties.

[6] Further, in this analysis—and in the subsequent analyses of the PSID and Census—we drop observations from Alaska due to inconsistencies in county definitions across samples and over time. Here we also drop very small counties (with population less than 1,000) and a few counties where the percent of land used in farming was greater than 100 percent.

population that is very young or old also implement earlier. In contrast, counties where more of the land is used in farming implement later. In the final column we allow the impacts to differ within counties in the South. In general, the impacts of county characteristics are smaller (in absolute value) in counties South.

While these regression results show statistically significant impacts of these county characteristics on the timing of food stamp implementation, overall most of the variation remains unexplained. To illustrate this, Figure 5 provides scatter plots of each of the six county characteristics against the county implementation date. In each panel in the figure, the 1960 county characteristic is on the x-axis and the food stamp start date is on the y-axis. For guidance, we also provided the univariate linear regression line for each panel. The county observations and regression are weighted by the county population. These figures show that the association between the county characteristics and the food stamp start date is qualitatively not very strong and there is an enormous amount of variation that is not explained by the characteristics. This is consistent with the characterization of funding limits controlling the movement of counties off the waiting list to start up their FSP: "The program was quite in demand, as congressman wanted to reap the good will and publicity that accompanied the opening of a new project. At this time there was always a long waiting list of counties that wanted to join the program. Only funding controlled the growth of the program as it expanded." (Berry 1984, p. 36-37)

We view the weakness of this model fit as a strength—in that much of the variation in the implementation of FSP appears to be idiosyncratic. Nonetheless, in order to control for possible differences in trends across counties that is spuriously correlated with the county treatment

effect, all of our regressions include interactions of these 1960 pre-treatment county characteristics with time trends.[7]

This period of FSP introduction took place as part of the much larger federal "war on poverty." Another source of bias may be the introduction or expansion during this period of Medicaid, AFDC, WIC, and Head Start. If these programs are mainly varying at the state level then our controls for state linear time trends or state-year fixed effects should absorb these program impacts. However, to control for the possible coincident expansion of other programs, we include annual measures of county per capita transfer payments which we obtained from the Bureau of Economics Analysis Regional Economic Information System. This data will be discussed below.

III. Expected Effects of Food Stamp Introduction

The current Food Stamp program provides a benefit to eligible families which is the difference between the cost of a family-size adjusted "thrifty food plan" (e.g. the *guarantee* in transfer program parlance) and the amount a family can afford to spend on food. In this scenario, as presented in Figure 6, the original budget line reflects the tradeoff between food and all other goods, and is shifted out horizontally by the amount of food stamps received (labeled here as B_F). The basic prediction of this transfer is that overall spending on food and other goods will increase as shown by the illustrated optimal points C_0* and C_1*. Out of pocket food expenses are expected to decrease (here the decrease is F_2-F_0). Consequently, the increase in food consumption, shown here as F_1-F_0, is less than the increase in food stamps B_F. In the "take it or leave it plan" shown here, a recipient who would choose to consume *all* other goods and no

[7]Another approach might be to use these estimates to form propensity scores for matching counties. However, the weak fit of the model renders this less appealing.

food stamps would still be able to purchase the original bundle, plus the food stamp amount in food, and would locate at the kink.

The benefits of the food stamp program are typically understood in a Southworth (1945) model, which shows that for families that want to spend more than the amount of their food stamp benefits on food, program participation is equivalent to a cash transfer in the amount of the food stamp discount. For other families who would spend less on food in a pure income transfer scheme than the thrifty food budget amount (or, as economists think about it, families that are on the kinked part of the budget constraint), the program is associated with some deadweight loss and a change in the relative price of food compared to other goods, but still is associated with an increase in the size of a family's budget.

Prior to 1978 (and during the time period studied here), though, the program required participants to purchase food stamps at a discounted rate.[8] How this "purchase requirement" alters the standard budget analysis is illustrated in Figure 7. Those who select into the program must trade some of their income (call it C) for food stamps. The sloped part of the budget constraint is still shifted outward by the "discount factor" (that is, the difference between the face value of the stamps B_F and the purchase price C), but the top is censored. That is, a participant can no longer choose any consumption bundles that would have them spending more than their total income (Y) minus C.[9] This means that there will likely be more people consuming at the kink in the budget constraint under the old-style, purchase requirement program than under the new, take-it-or-leave it program. It is therefore likely that we will be able to measure an increase

[8] That is, if the family was deemed able to afford to spend $100 on food, but the cost of the thrifty food plan was $300, the family could purchase $300 in food stamps for the cash price of $100. Today, a similar family would receive $200 in food stamps and would not have to outlay any cash.

[9] Of course, a potential recipient would choose not to participate in the program if they would prefer to consume such a bundle to the consumption bundle at the kinked part of the budget constraint.

in food spending that is larger than it would be under the new-style program, or under a cash transfer scheme instead.[10]

Since the program increases the size of a family's budget, we can look for program impacts along many outcomes that should be impacted by increased income. But the structure also favored increased consumption of food, so an obvious starting point is to test the impact of the FSP on food spending. The PSID provides several measures of food consumption – food at home, food bought with food stamps, and food away from home – that in theory respond in different manners to the food stamp program.[11] Clearly food bought with food stamps should increase after the introduction of the program, and we would expect to see the increase there at least somewhat offset by declines in purchase of groceries with cash income. The prediction for spending on meals away from home is ambiguous given the positive income effect (due to the income transfer) and negative substitution (due to the reduction in the price of food at home). An increase in total food consumed from all sources would reflect the combined impact of higher total cash plus food stamp income under food stamps and the distortion of consumption toward food for those consuming at the kink point.

We will also measure the impact on other outcomes, such as labor supply and family cash income.[12] Like other means-tested programs, the FSP alters the household's labor-leisure tradeoff by increasing total income conditional on hours worked. In addition, benefits are reduced for each additional dollar earned (although at 30 percent the tax rate is much lower than typical tax rates under welfare programs). The combination of the income effect of the benefit as

[10] After a certain point (1975?), participants were given the choice to purchase their entire food stamp allotment or their choice of .25, .5 or .75 of that amount at the same discount rate. This would serve to reduce the number of families consuming at the kink point.

[11] Food bought with food stamps is the value of food bought less the purchase price. So it is the "benefit" from participating in food stamps.

[12] In an earlier version of the paper, we examined impacts on health outcome using the PSID variable on head's missed work due to illness. We concluded that this measure is too crude to capture any impacts as those models were very imprecisely estimated. We are currently exploring using the National Health Insurance Survey to explore impacts on health more comprehensively.

well as the substitution effect from the benefit reduction rate leads, unambiguously, to a predicted decline in employment, hours worked, and (if wages are fixed) earnings. In addition, family cash income (which as measured does not include food stamp benefits) would also be predicted to fall. We explore the possible work disincentives in the PSID by examining impacts on head's employment, annual hours, earnings, and family income.

IV. Literature Review

Most recent studies focus on whether food spending is increased because of the FSP, but the available variation that can be used to identify the impact is limited. Most of the observational studies in the literature (described in Fraker, 1990, and Levedahl, 1995) estimate the marginal propensity to consume food using the following linear specification:

$$fspend_i = \beta_0 + \beta_1 cash_i + \beta_2 fstamp_i + Z_i\gamma + \varepsilon_i \qquad (1)$$

where $fspend_i$ is expenditure on food for household *i*, $cash_i$ and $fstamp_i$ are income in cash and from food stamps, respectively, Z_i is a vector of covariates such as household size and age/gender makeup, and ε_i is a normal disturbance term. Variants on this standard specification include the "semi-log specification" which replaces *cash* with *ln(cash)* (food stamps, though, are typically still estimated in levels) or a "double-log specification" in which *ln(fspend)* is the dependent variable. Here the primary impact of the food stamp program is measured as the increased consumption out of food stamps compared to cash income, as measured by the differences in estimated coefficients by income type in equation (1).

Fraker (1990) provides a comprehensive summary of the literature. He reports that most of the food stamp literature finds that the marginal propensity to consume (MPC) food out of food stamps is 2-6 times higher than out of cash income and can easily reject the null hypothesis that $\beta_2 = \beta_1$, even when the samples are restricted to only food stamp recipients who spend more

on food than their food stamps are worth. The median study in Fraker's literature review reports a marginal propensity to consume food out of food stamp income that is 3.8 times as large as that from cash income.[13] These findings are often interpreted as evidence that a policy replacing food stamps with a cash-transfer system would significantly reduce food spending.

The literature suffers from many of the standard shortcomings of observational studies. For example, most of the estimates were identified from differences between food stamp recipients and equally low-income families that were eligible for food stamps but for some unobservable reasons chose not to enroll in the program (such as a preference to consume non-food goods). In this case, a comparison between participants and non-participants may overstate the impact of the program.

Labor supply effects of the FSP have been studied by Hagstrom (1996), Keane and Moffitt (1998) and Moffitt and Fraker (1988). This prior literature finds insignificant or small work disincentive impacts of the food stamp program. For example, Moffitt and Fraker find that the FSP reduces hours of work by participants by 1 hour per week, or since mean weekly hours worked for Food Stamp participants is about 9.5, a 9 percent reduction.

V. Data

The PSID is a longitudinal data set collected by the Institute for Social Research (ISR) at the University of Michigan which began in 1968 with a sample of about 5,000 households containing 18,000 individuals. All members (and descendants) of these original survey families have been re-interviewed annually such that by the twenty second year of the panel (1989), more than 38,000 individuals have participated in, or are currently participating in, the survey. The original 1968 sample consists of two subsamples: a nationally representative subsample of 3,000

[13] The MPC out of cash is estimated to be 0.03-0.17 (with most estimates between 0.05 and 0.10), and the MPC out of food stamps is estimated to be 0.17-0.47.

households (Survey Research Center or SRC subsample) and a subsample of 1,900 households selected from an existing sample of low income and minority populations (Survey of Economic Opportunity or SEO subsample). To adjust for this nonrandom composition, the PSID includes weights designed to eliminate biases attributable to the oversampling of low income groups and to attrition. All results will use the weights provided by the PSID.

The central focus of the PSID is labor market and demographic variables, containing substantial detail on income, employment, and family composition. It also includes annual information on annual food expenditures for food consumed at home, away from home, and food purchased with food stamps (the value of food purchased less the purchase requirement). These data have been used by many researchers examining impacts of social programs (for example see Gruber 1997, 2000). In addition, we also can measure head's employment status, annual hours worked, annual earnings, and total family income.

The public use release of the PSID includes state level identifiers for each year. In addition, we have obtained county level identifiers for each family in each year through special arrangement with the ISR.

We use data from interview years 1968 to 1978. We stop the sample in 1978 so that our entire analysis period is before the end of the purchase requirement (which occurred in 1979). For our analysis of food consumption, we exclude interview years 1968 and 1973. We drop 1973 because the food consumption variables were not included in that survey. We drop 1968 because of inconsistencies in the definition of the food variables in that year.[14]

There is some ambiguity in what time frame the food variables correspond to. In general, the survey is taken in spring and families are asked about "typical food consumption." The PSID

[14] In particular, the food stamp variable is measured more broadly as food assistance in 1968 and includes commodity distribution program, food stamp program, and other in-kind benefits. As a consequence, we find nontrivial food stamp (=food assistance) participation rates in 1968 in counties that do not as of yet have food stamp programs in place. Further, the cost of meals away from home is defined more broadly than in later years and the amounts are bracketed.

then annualizes this measure and applies it to the prior calendar year. Nonetheless we assume, as other researchers have, that the food spending variables apply to this year (add citations here). All labor supply, earnings, and income variables correspond to the prior calendar year.

We present estimates for three samples of the PSID. We begin with the group most likely to be eligible for the program—low educated female headed households with children. In particular, we use female heads with less than or equal to a high school education. We examine the full sample of low educated female heads as well as the subset of nonwhite female heads. For the 1968-1978 sample, this results in a sample size of 6,996 (person-years) for all low educated female heads and 5,410 for nonwhite female heads.

Unlike virtually all other U.S. public assistance programs, however, there is no categorical eligibility for the food stamp program. That is, eligibility for food stamps is *not* limited to female headed household with children. Table 2 presents food stamp participation rates by education, family type and race based on the 1980 Current Population Survey. We use the 1980 CPS because this is the first year the CPS asks about food stamp participation.[15] The results show that food stamp participation among single parent families with children is three times as high as the rates in any other group. For example, among families where the head has less 12 years of education, 52 percent of single parent families with children receive food stamps compared to 15 percent of married couples with children, 15 percent of single nonelderly persons with no children, and 13 percent of single elderly. The rates are uniformly higher among black families, with 68 percent of single nonelderly parent families with children (where the head has less than 12 years of education) participating in food stamps.

To take advantage of the universal nature of the PSID, we also estimate models where we pool all observations. To capture their varying risks of being treated, however, we multiply the

[15] The participation rates are very similar when tabulated on the smaller sample sizes in the PSID.

treatment dummies by a group level food stamps participation rate. This is described in more detail below.

Descriptive statistics for the analysis sample are presented in Appendix Table 2. The sample is extremely disadvantaged: average income hovers right at the poverty line, and approximately half of respondent-by-year observations used food stamps. The program was available in their county of residence in almost 90 percent of observations. Over 60 percent of the sample is a high school dropout, and on average there are 2.5 children per household.

To augment our analysis of the work disincentive effects of the FSP, we also use the Decennial Census. The problem with using the census, however, is that our identification strategy relies on identifying counties which we need to assign the FSP treatment. The public release census microdata, unfortunately, do not include county identifiers. We use county level tabulations of the full census which the Census Department releases as separate data products. We use these STF (summary tape files) data to construct county panels for 1960, 1970, and 1980. The limitation of this data is that we can only use the variables that have been released with the data and that are consistently available over the three censuses. The outcome variables we can examine include: male and female labor force participation rates and the percent of families with family income in excess $10,000 (in 1979 dollars). These are aggregate county outcomes can not be refined for groups most likely to be impacted by the FSP. [16]

VI. Methodology

[16] The smallest geographic area identified in the census micro data is the county group. We explored using the 1970 and 1980 public use micro data IPUMS data (there is no microdata for 1960) as an additional source for examining the work disincentive impacts. The advantage of using the IPUMS is that we can construct the variables we would like for the treatment groups we like. However, we have to aggregate the FSP treatment across all counties in the country group. Further, we had to combine county groups to accommodate the changing county group boundaries between the 1970 and 1980 Census. In the end, this aggregation was substantial and the results had very low power. The results are available on request.

Our data discussed above consists of household level data with geographic indicators that span the period during which the FSP is introduced. By pooling periods, we can control for area and time fixed effects. This helps to address the concerns arising from the voluntary nature of the FSP introduction across counties. In particular, we estimate the following model where the unit of observation is the family-year:

$$y_{ict} = \alpha + \delta FSP_{ct} + X_{it}\beta + CB60_c{*}t + \gamma REIS_{ct} + \eta_c + \lambda_t + \varepsilon_{ict} \qquad (2)$$

where y_{ict} is the outcome variable, FSP_{ct} is an indicator variable equal to 1 if county c in year t has a FSP program, X_{it} are family characteristics, $CB60_c$ are 1960 county characteristics, $REIS_{ct}$ are yearly per capita county transfer income variables, η_c are county fixed effects and λ_t are time fixed effects. We estimate additional specifications with state linear time trends, state-year fixed effects, and family fixed effects. The individual controls X include controls for education, race, urban location, and state unemployment rate. In addition, X includes dummy variables for number of children and number of adults thus nonparametrically controlling for differences in food needs across families. All estimates are weighted using the PSID family weight and the standard errors are clustered on county.

The food variables in the PSID measure expenditures as of the interview, which is fielded in spring of each year.[17] Thus t in (2) above refers to the interview year. Given this timing, we set the treatment variable FSP_{ct} to 1 if county c has a FSP program in place by January of year t. When examining the labor supply and income, the variables refer to the calendar year prior to the interview year. In that case, t refers to the year prior to the interview year and we define the

[17] Add a footnote about food stamps. Mostly last year, sometimes this year. We explored the sensitivity to treating it as last year and results are XXX.

treatment variable to be 1 if county *c* has a FSP in place by January of the year prior to the interview year.[18]

We include the pre-treatment county variables (CB60) interacted with linear time trends to control for the observable determinants of county food stamp adoption (Table 1). The variables in CB60 include the percent of land in farming and the percent of population black, urban, age less than five, age greater than 65 and with income less than $3,000 each interacted with a linear time trend. We include the REIS to control for the possible coincident expansions of other transfer programs during this period. In particular, we include three per capita annual county transfer income variables which we constructed from the BEA REIS data. Specifically, we include a measure for (1) retirement and disability programs, (2) medical care (Medicare, Medicare, and military health care), and (2) cash public assistance (AFDC, SSI, and general assistance).

We also present estimates that include all nonelderly headed families. When we present these pooled models, we modify the model to include a group specific participation rate P_g interacted with the treatment indicator:

$$y_{ict} = \alpha + \delta FSP_{ct} P_g + X_{it}\beta + CB60_c{*}t + \gamma REIS_{ct} + \theta_g + \theta_g {*}t + \eta_c + \lambda_t + \varepsilon_{ict} \qquad (3)$$

We use 24 groups defined by race (white, nonwhite), marital status (married, not married), presence of children (yes, no), and education (<12, 12, >12). In this specification, we also include fixed effects for each group and for group interacted with linear time.

VII. Results for Expenditures on Food

We begin with the group most likely to be impacted by the food stamp program—nonwhite low educated (high school education or less) female headed families with children.

[18] There is some evidence (add citation) that it took some time to ramp up the new county FSP programs. We have explored the sensitivity to lagging the treatment effects and while the specific estimates change somewhat, the results are qualitatively similar.

The main results, presented in Table 3, provide estimates for four outcome variables: any food stamps (0/1), the log of real expenditures on food at home, any meals out (0/1), and the log of real total food expenditures.[19] We present five specifications. The first specification includes demographics, the 1960 county characteristics interacted with linear time, and year and county fixed effects. In the second specification we add state linear time trends. In the third we add the REIS per capita county transfer income variables. In the fourth, we adopt the basic Engle curve specification and control for the log of family (cash) income. We postpone concerns about the possible endogeneity of this variable (due to work disincentive impacts of the food stamp program) to the next section. In the final specification, we include replace the state linear time trends with state-year fixed effects.

The first panel shows consistently that the introduction of the food stamp program leads to increases in food stamp receipt (as expected). We can interpret the coefficient as the effective participation rate. Note that these implied participation rates are somewhat lower than those implied in Table 2 and may due to a program ramp up period taking place. The second panel shows that, as predicted by the theory, cash food expenditures decline when the food stamp program is introduced. The numbers in brackets inflates up the parameter estimates using the group food stamp participation rate.[20] Thus the most saturated models (in columns 4 and 5) show that the introduction of food stamps leads to a 18 to 25 percent reduction in out of pocket expenditures on food among those that take up the program. The third panel shows negative point estimates, but no significant impact of the FSP on meals out. Finally, in the fourth panel, FSP is associated with an insignificant increase in total expenditures on food. Overall, these

[19] To convert the food expenditures to real values, we use the separate CPIs for food at home and food away from home. All amounts are in 2003 dollars.

[20] To inflate the estimates, we calculate the food stamp participation rate using the 1976-1978 PSID sample. We limit the sample to these years so that it is after all counties have adopted the program and before the purchase requirement is eliminated.

estimates are consistent with the theoretical predictions but not always statistically significantly so.

The results show that adding the controls for the REIS county transfer income (column 3) and family income (column 4) improve precession but make little difference for the parameter estimates. It is useful to examine the coefficient on log of real family cash income to compare it with estimates in the literature. Our results imply a marginal propensity to consume out of cash income around 5-6 cents on the dollar. This is quite consistent with the existing literature.

Table 4 broadens the sample to include all low educated female headed households with children. The results are broadly consistent with the earlier results for nonwhites with a few notable exceptions. First, we now have statistically significant increases in total spending on food, but we find a zero impact of the program on out of pocket food expenditures. Due to the relatively large standard errors, however, we can not reject large reductions (or increases) in out of pocket food expenses as a result of the program introduction. As in Table 3, we include in brackets the estimates inflated by the sample food stamp participation rate. This implies, as shown in the last panel, that the introduction of food stamps increases food expenditures by over 25 percent.

One can make a further adjustment of this estimate to calculate how the predicted increase in total food expenses compares to the increase in food stamp benefits. The estimates in Table 4 imply that a $100 increase in food stamps leads to an increase in overall food expenditures of between $50 and $70. The estimates in Table 3, while insignificant, suggest smaller impacts of between $20 and $60. One should be very cautious in interpreting these "marginal" calculations because of the nonmarginal nature of the research design. Our results, like the earlier literature, show a significantly larger marginal propensity to consume out of food stamps compared to cash income.

Table 5 expands the analysis yet further to include all nonelderly headed families. To reflect differing probabilities of being affected by the program, we interact the treatment dummy with a group specific FSP participation rate as shown above in equation (3).[21] Note that with this interaction, the estimates are now self-inflated and represent impacts for families that take up the program. We expand the sample in an attempt to improve the power of the analysis and also to reflect the universal eligibility of the food stamp program. The results are again qualitatively consistent—the introduction of the food stamp program leads to reductions in out of pocket food spending and meals out and an increase in total food consumption. As with the low educated female head sample, the results for out of pocket food spending and meals out are not statistically significant. Interestingly, the magnitude of the results in this pooled sample is quite similar to the more targeted sample. For example, the results in Table 5 show a 20 percent increase in total food expenditures with the introduction of the FSP compared to 20-28 percent in the sample of all low educated female heads of household.

[Add discussion for reasons why MPC out of food stamps exceeds the MPC out of cash income. Also discuss why this should be larger during the purchase requirement period.]

Sensitivity Checks

We conducted many specification tests. First, in Table 6 we present placebo test estimates for a group that is not expected to be impacted by the food stamp program. In particular, we provide estimates for highly educated (college education or higher) white married couples with children. The results, as expected, show no significant impacts of the FSP on food consumption for this group. In fact, the point estimate on our most robustly estimated variable—

[21] We limit the analysis to nonelderly households because of problems with small cells in elderly demographic groups. The results are qualitatively the same if we include the elderly.

total food expenditures—is negative compared to the consistently positive estimates for the likely impacted groups.

Further specification testing is provided in Tables 7 and 8. We present the specification tests for the sample of low educated female headed households with children. (The results are qualitatively the same for the nonwhite female headed sample and the pooled sample.) Panel A. of Table 7 presents estimates where we drop all observations with minor or major imputations to the food variables. Imputations represent about one to five percent of observations depending on the variable. Panel B of Table 7 presents estimates where we trim the data and drop strange observations. In particular we drop observations where the ratio of food spending to income exceeds 0.85 or where family income or total expenditures on food were reported to be zero. The results change very little with these adjustments.

In the third panel of Table 7 we explore whether the treatment effect varies over time by adding an interaction between the treatment effect and a dummy for 1973 or later. Time varying treatments might result because the early adopting counties were more enthusiastic about the program than the counties that were forced into compliance. However, we find no evidence of differences over time. In the fourth panel of Table 8 we replace the treatment dummy with a 2-year lead of the treatment dummy. These results show a statistically significant and positive impact on out of pocket and total food spending. This could signal some underlying trends that are correlated with the treatment that have not been absorbed by the model.

As discussed earlier, the expansion of the food stamp program took place during a time of great change in the U.S. system of government support. We address this by controlling for the county level transfer variables from the REIS. Another, more direct approach, is to examine the impact of the FSP on family government transfer income. In particular, with the PSID we can measure income of the head and wife from AFDC, other welfare income (SSI, General

Assistance), and social security. The results of that exercise, presented in Table 8, show no significant impact of the FSP on other sources of income support.

In sum, the results in this section show that the food stamp program is associated with increases in total food consumption and (less consistently) decreases in out of pocket food spending. The results are robust to including state linear time trends, state-year fixed effects, and do not appear to be the result of other program expansions during this time period.

VIII. Results for Work Disincentive Effects

To review, the FSP has the structure of an income support program. A family is eligible for some amount of food stamps which decreases as earnings increase. The combination of the income effect of the benefit as well as the substitution effect from the benefit reduction rate leads, unambiguously, to a predicted decline in employment, hours worked, and (if wages are fixed) earnings. In addition, because family income is cash (or *money*) income and thus does not include food stamp benefits, we would also expect family income to fall. It is important to establish whether there are work disincentives of the program because impacts of a reduction in earnings may offset gains in additional food consumption. The prior literature, which is based mostly on structural estimation, finds little or no impact of the FSP on labor supply. Here we take a very different approach by using the introduction of food stamps.

PSID results for all low educated female heads and for nonwhite low educated female heads are presented in Table 9. We present estimates for whether the head worked at all last year, the head's annual hours last year, the head's annual earnings last year, and the total family income.[22] Note that hours and earnings are unconditional measures, that is they include nonworkers. Thus any impact on hours or earnings will reflect both intensive and extensive labor

[22] We estimate the family income as a log specification but the head's earnings as a level due to earnings being zero for nonworkers.

margins. Overall, the point estimates are consistent with the theoretical predictions of decreases in employment, hour, earnings and income. However, with the exception of annual hours in the all low educated female heads sample, none of the estimates are statistically significant. Also evident is the smaller effects among nonwhites.

This result, which is consistent with the prior literature, perhaps is not surprising given the relatively low benefit reduction rate of 30% that is faced by food stamp recipients. [Insert discussion of the likely magnitude of the labor supply effect given reasonable elasticities and the program parameters.]

We can also examine the impacts on labor supply by using the decennial Census data. Recall that the only public use release of the Census that identifies the county of residence is county-level aggregate files—known as the STF files. Using that data, we estimate models of labor force participation rates for all females and males (aged 16 and over), and all females with a child under age six. Lastly, we can examine the propensity to have family income in excess of 10,000 in real 1979 dollars. We estimate models similar to those presented above, with decade fixed effects replacing the year fixed effects. Because the observations are at the county-year level, we do not include any demographic characteristics and the regression is weighted using the county population. As above, standard errors are clustered on county. The results are presented in Table 10—with panel A. reporting estimates for all persons and panel B reporting estimates for nonwhites (for variables that are available for nonwhites).

These treatment groups are broader than those used in the PSID but it is all we have available in the STF data. Note, however, that the food stamp participation rates presented in Table 2 show that participation rates among nonwhites are quite high even without conditioning on education and female heads of household. The results show no evidence of a work disincentive effect of the food stamp program. These results show a relatively statistically precise

zero estimated impact. For example, the largest (relative) estimate is for nonwhites which shows that implementing a food stamp program leads to an insignificant positive 0.6 percentage point increase in female labor force participation rate compared to the mean value of 38.

IX. Conclusion

Even though there have been changes in the population of the United States and the parameters of the Food Stamp Program since the period we are studying, these results are relevant for today's policy debates. To date, there have been no studies that we have found that provide credible evidence on the impact of the FSP on consumption and income. The FSP is once again receiving considerable political attention, and it is crucial from a policy maker's perspective to be able to measure the benefits of the program not only on food spending, but also on other outcomes like income, child well-being, and health.

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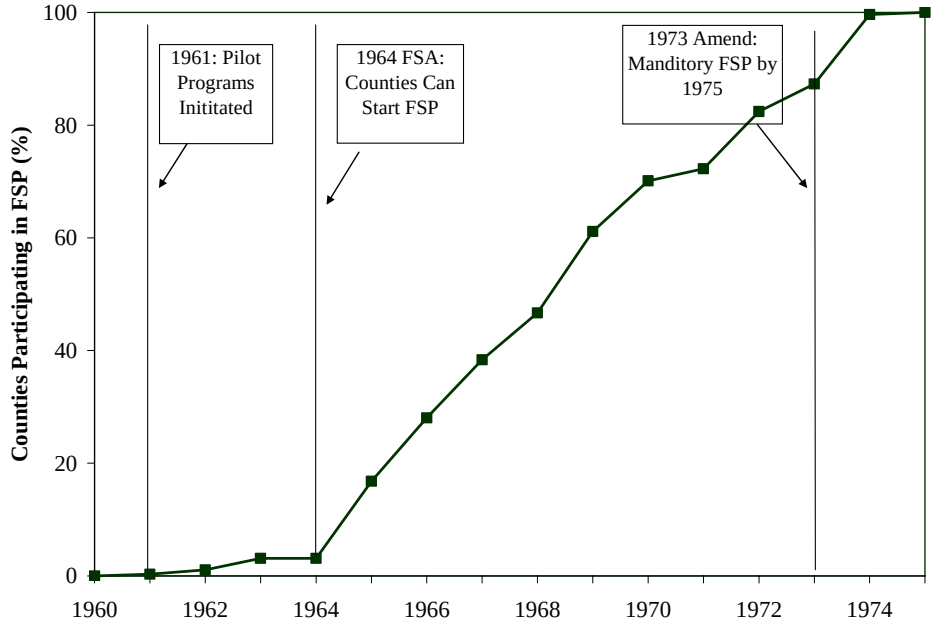
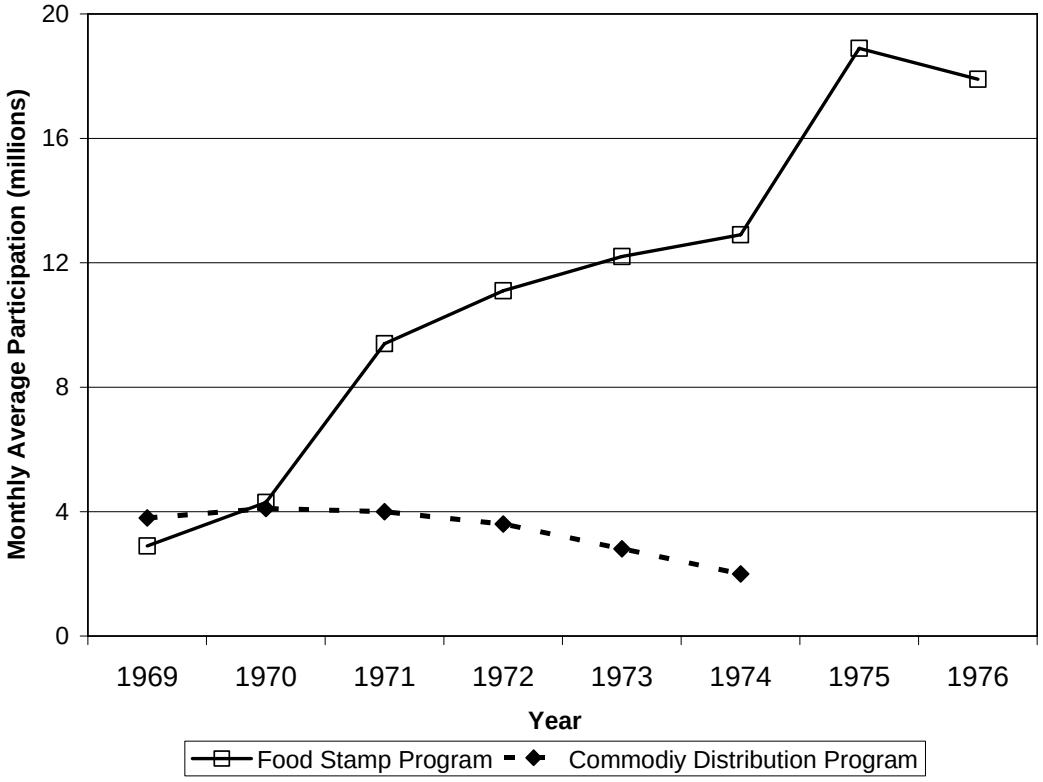
Figure 1: Cumulative County Participation in FSP, Weighted by 1970 Population



Source: Author's tabulations of county FSP start dates. Counties are weighted by 1970 total population.

Figure 2: Food Assistance Program Participation, 1968-1976



Source: Berry (1984), Table 3.

Figure 3: Food Stamp Program Start Date, By County (1961-1975)

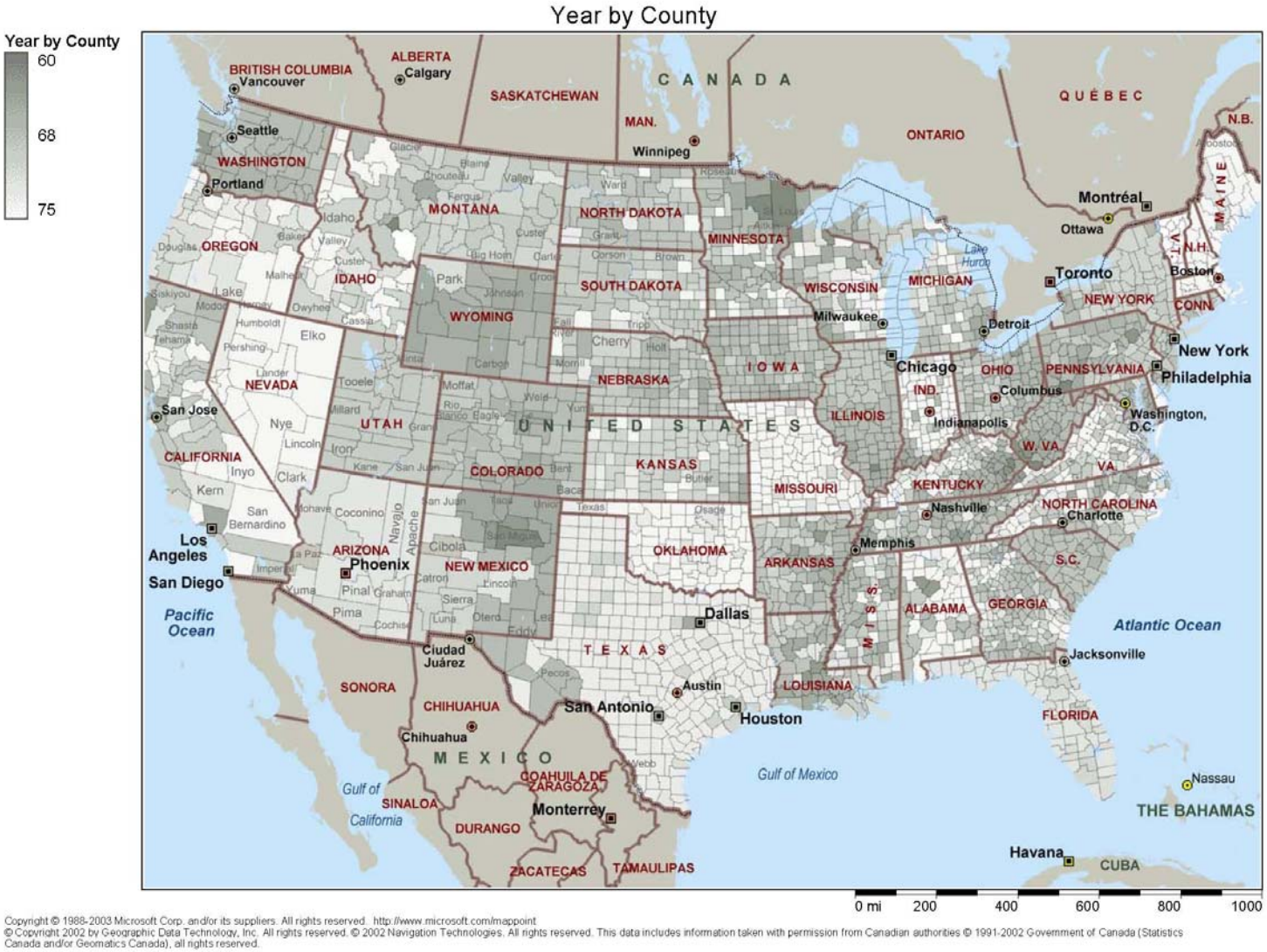
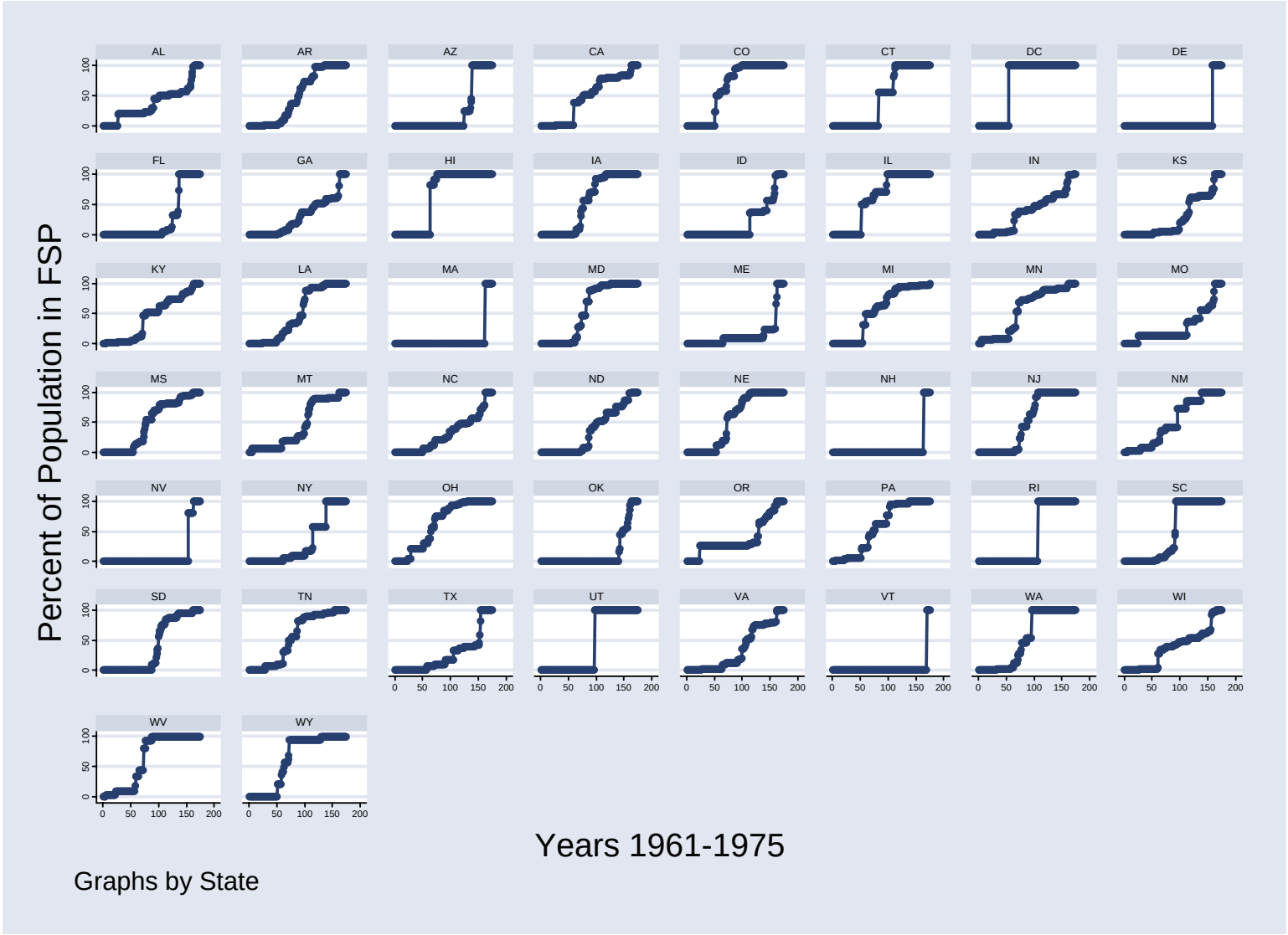


Figure 4: Percent of Population Participating in FSP, By State

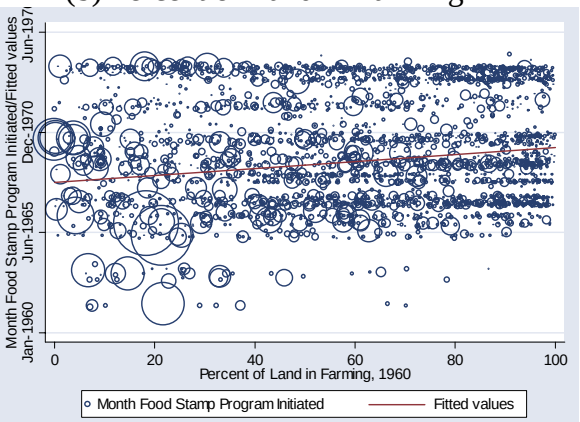


Source: Authors' tabulations of county FSP start date. Counties weighted by 1970 population.

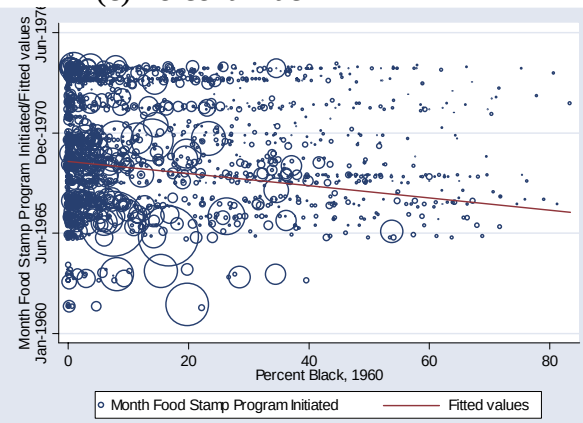
Figure 5: 1960 County Characteristics and Food Stamp Start Date

(a) Percent with Income <$3,000

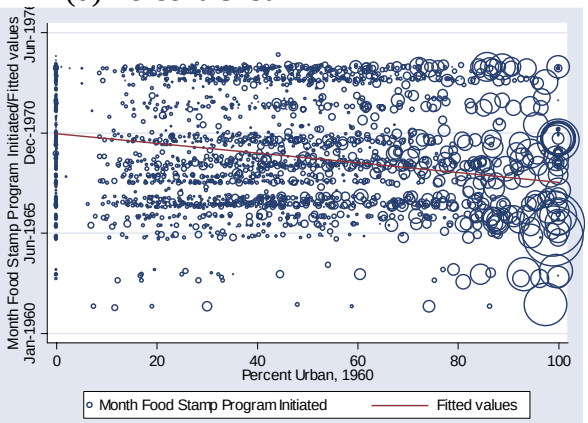
(b) Percent of Land in Farming



(c) Percent Black

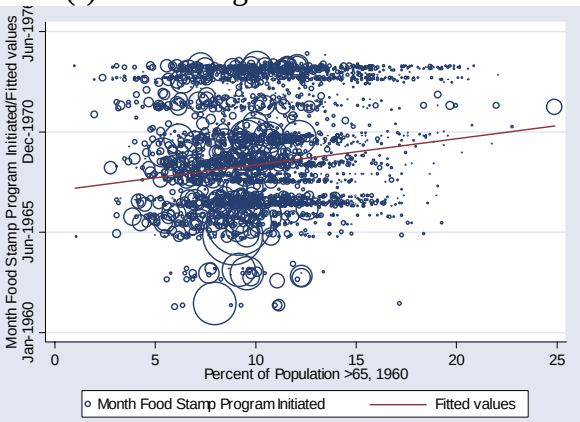


(d) Percent Urban



(e) Percent Age<5

(f) Percent Age >65



Note: Each graph provides a scatterplot of a 1960 county characteristic (x-axis) against the food stamp start date (y-axis) where the points are weighted by the 1960 county population. The graphs also contain the linear fit where the regression is weighted by 1960 county population.

Figure 5: Food Stamps' Impact on Budget Constraint with No Purchase Requirement

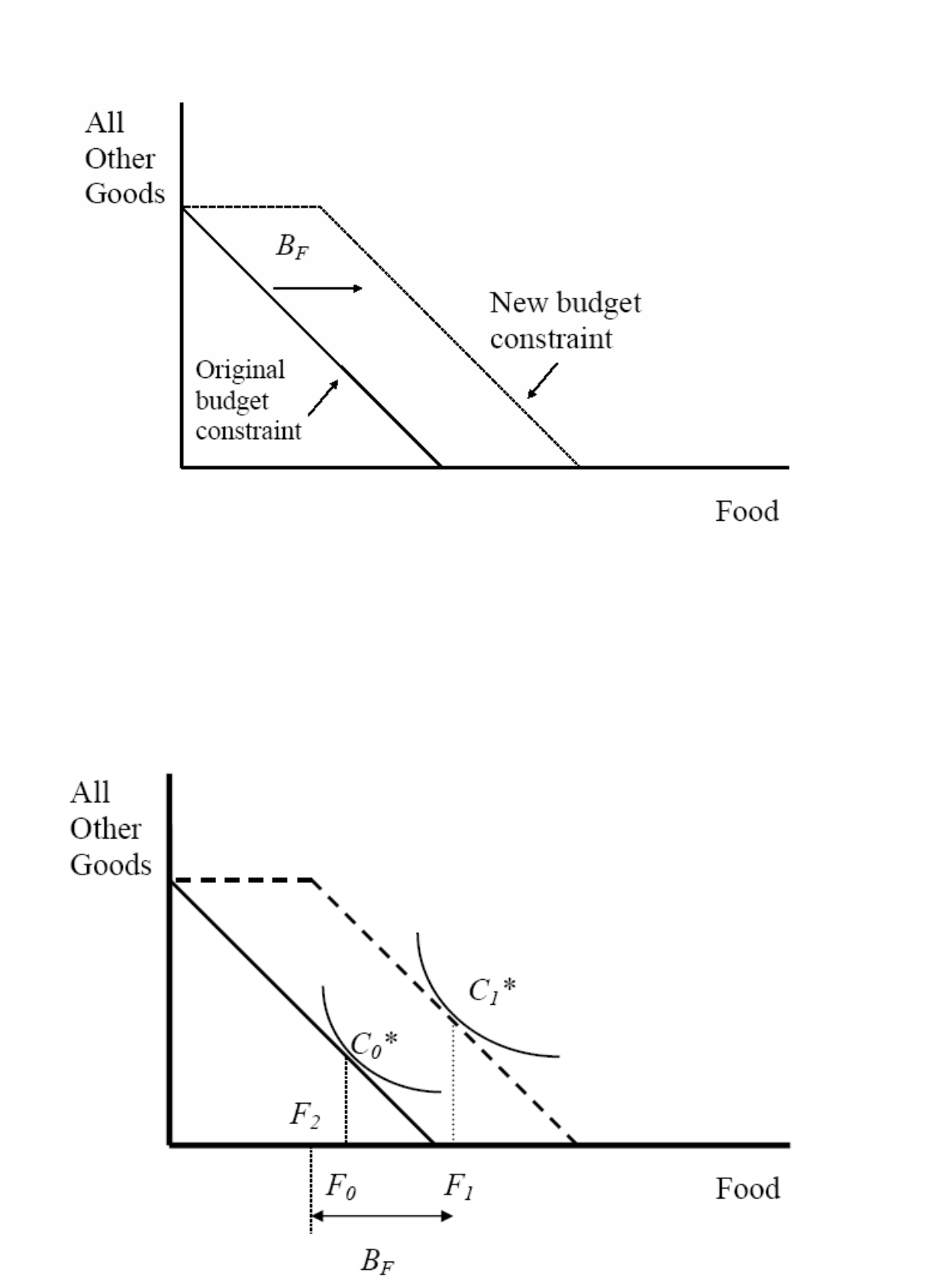
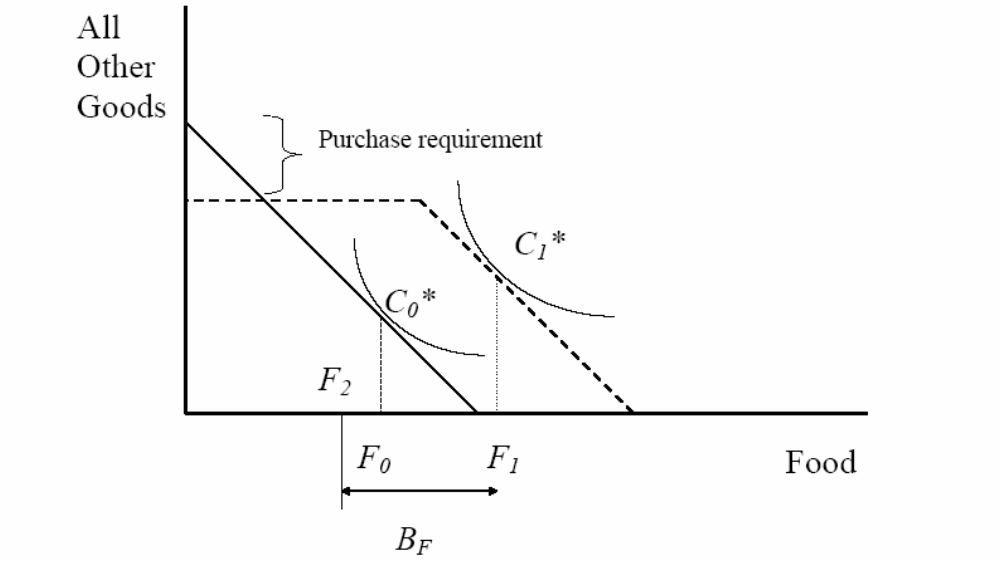


Figure 6: Food Stamps' Impact on Budget Constraint with a Purchase Requirement



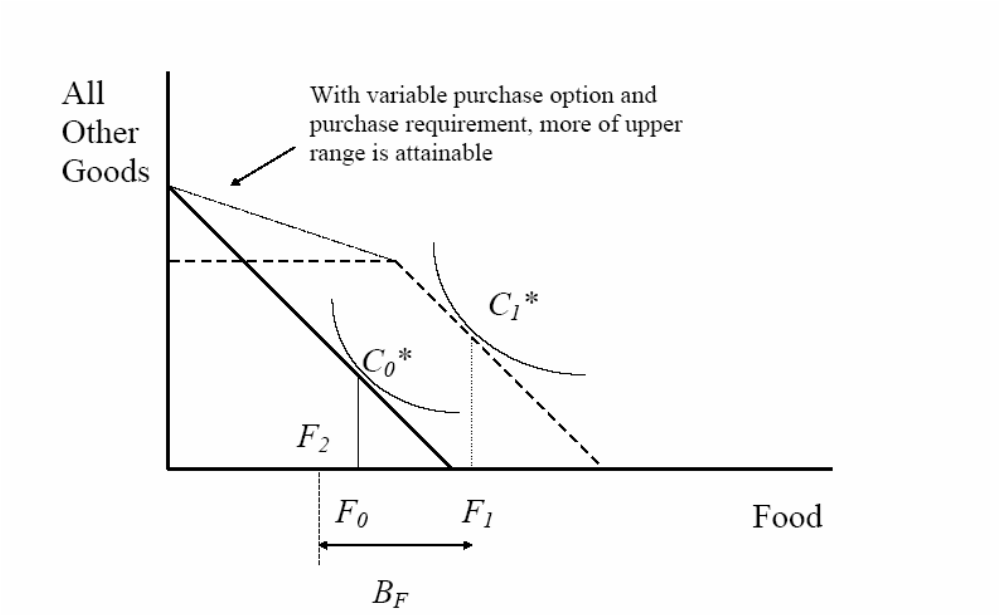


Table 1
Determinants of County Level Food Stamp Program Start Date
Analysis Using the 1960 City and County Data Book

	(1)	(2)	(3)
Percent of land in farming	0.033	0.205***	0.216***
	(0.029)	(0.027)	(0.033)
Percent of population with income less than $3,000	0.485***	-0.122	0.422***
	(0.098)	(0.096)	(0.154)
Percent of population urban	-0.103	-0.255***	-0.180***
	(0.041)	(0.035)	(0.047)
Percent of population black	-0.609***	-0.435***	-0.912***
	(0.077)	(0.072)	(0.141)
Percent of population age <5	-3.568**	-3.917***	-5.521***
	(0.737)	(0.635)	(0.826)
Percent of population >65	-0.814***	-1.326***	-3.689***
	(0.425)	(0.395)	(0.551)
South * Percent of land in farming			-0.177***
			(0.061)
South *Percent of population with income less than $3,000			-0.742***
			(0.203)
South * Percent of population urban			-0.075
			(0.073)
South * Percent of population black			0.700***
			(0.166)
South * Percent of population age <5			2.612**
			(1.321)
South * Percent of population >65			4.212***
			(0.806)
State Fixed Effects		X	X
Adjusted R-squared	0.08	0.52	0.53
Number of Observations	2,823	2,823	2,823

Notes: The data is at the county level and the dependent variable is equal to the calendar month (normed to 0 in January 1961) that the county began offering the Food Stamp Program. The control variables come from the City and County Databook for 1960. Alaska counties are dropped due to missing data on the food stamp program. Very small counties (with population less than 1,000) are dropped because of missing data on some control variables. A small number of counties are dropped because the variable *percent of land in farming* exceeds 100 percent. Estimates are weighted using the 1960 county population.

Table 2
Food Stamp Participation Rates by Demographic Group
1980 March Current Population Survey

	Education Group		
	Less than High School	High School	Greater than High School
A. All Races			
Single parent with children, nonelderly	0.53	0.29	0.17
Married couple with children, nonelderly	0.15	0.05	0.02
Single, no children, nonelderly	0.16	0.04	0.03
Married, no children, nonelderly	0.03	0.01	0.01
Single, no children, elderly	0.13	0.04	0.01
Married, no children, elderly	0.06	0.01	0.01
B. White			
Single parent with children, nonelderly	0.39	0.21	0.11
Married couple with children, nonelderly	0.12	0.04	0.01
Single, no children, nonelderly	0.12	0.04	0.02
Married, no children, nonelderly	0.02	0.01	0.00
Single, no children, elderly	0.09	0.03	0.01
Married, no children, elderly	0.04	0.01	0.01
B. Black			
Single parent with children, nonelderly	0.68	0.43	0.33
Married couple with children, nonelderly	0.23	0.09	0.04
Single, no children, nonelderly	0.27	0.10	0.06
Married, no children, nonelderly	0.09	0.09	0.02
Single, no children, elderly	0.32	0.19	0.08
Married, no children, elderly	0.18	0.07	0.04

Notes: Tabulations from 1980 Current Population Survey.

Table 3: Impact of Food Stamp Introduction on Family Food Expenditures
Nonwhite Low Educated Female Headed Households with Children

	(1)	(2)	(3)	(4)	(5)
A. Any Food Stamps (0/1)					
County FSP Implemented	0.283***	0.400***	0.408***	0.407***	0.251***
	(0.047)	(0.061)	(0.062)	(0.065)	(0.056)
R Squared	0.32	0.34	0.34	0.38	0.44
Number of Observations	4,462	4,462	4,462	4,462	4,462
B. Log(Real Expenditures on Food at Home)					
County FSP Implemented	0.020	-0.082	-0.094*	-0.096*	-0.132**
	(0.081)	(0.056)	(0.057)	(0.053)	(0.065)
	[0.038]	[-0.154]	[-0.180]	[-0.180]	[-0.248]
R Squared	0.36	0.39	0.39	0.43	0.36
Number of Observations	4,246	4,246	4,246	4,246	4,246
C. Any Meals Out (0/1)					
County FSP Implemented	-0.021	-0.051	-0.051	-0.050	-0.016
	(0.065)	(0.052)	(0.052)	(0.052)	(0.053)
	[-0.039]	[-0.096]	[-0.096]	[-0.094]	[-0.030]
R Squared	0.26	0.26	0.26	0.26	0.26
Number of Observations	4,462	4,462	4,462	4,462	4,462
D. Log (Real Total Food Expenditures)					
County FSP Implemented	0.142**	0.050	0.059	0.059	0.049
	(0.059)	(0.049)	(0.046)	(0.045)	(0.060)
	[0.266]	[0.094]	[0.111]	[0.111]	[0.092]
R Squared	0.42	0.43	0.43	0.46	0.42
Number of Observations	4,442	4,442	4,442	4,442	4,442
Demographics	X	X	X	X	X
1960 Cty Vars * Linear Time	X	X	X	X	X
Year Fixed Effects	X	X	X	X	X
County Fixed Effects	X	X	X	X	X
Per Capita Cty Transfers			X	X	X
Log(Real Family Income)				X	X
State x Linear Time		X	X	X	
State x Year Fixed Effects					X

Notes: Each parameter is from a separate regression of the outcome variable on a dummy variable equal to 1 if the county-year observation had a food stamp program in place by January of that year. The sample includes PSID families with children where the head is a nonwhite unmarried woman with a high school education or less in interview years 1969-1972 and 1974-1978. 1973 is omitted because the food variables were not asked in that year. We end the sample in 1978 so that we do not include years after the food stamp purchase requirement was eliminated. Women living in Alaska are dropped because of missing data on food stamp program start date. All outcome variables correspond to annual measures taken as of the interview (in spring of the interview year). Demographic controls include dummies for education, number of children, number of adults, race, urban location and state level unemployment rate. 1960 county variables include percent of land in farming and percent of population black, urban, age<5, age>65 and with income less than $3,000 each interacted with a linear time trend. Per capita county transfer income comes from the BEA REIS and includes measures for public assistance (AFDC, General Assistance), medical care (Medicare, Medicaid, military), and retirement and disability benefits. Estimates are weighted using the PSID weight and clustered on county. Standard errors are in parentheses and ***, **, and * indicate that the estimates are significant at the 1%, 5% and 10% levels. The numbers in brackets [ ] inflate the estimates by the food stamp participation rate.

Table 4: Impact of Food Stamp Introduction on Family Food Expenditures
All Low Educated Female Headed Households with Children

	(1)	(2)	(3)	(4)	(5)
A. Any Food Stamps (0/1)					
County FSP Implemented	0.157***	0.222***	0.229***	0.229***	0.201***
	(0.041)	(0.040)	(0.040)	(0.040)	(0.042)
R Squared	0.38	0.40	0.40	0.45	0.49
Number of Observations	5,781	5,781	5,781	5,781	5,781
B. Log(Real Expenditures on Food at Home)					
County FSP Implemented	0.026	0.010	0.023	0.019	0.010
	(0.056)	(0.053)	(0.053)	(0.050)	(0.066)
	[0.069]	[0.027]	[0.061]	[0.050]	[0.026]
R Squared	0.45	0.48	0.48	0.52	0.56
Number of Observations	5,528	5,528	5,528	5,528	5,528
C. Any Meals Out (0/1)					
County FSP Implemented	-0.075	-0.049	-0.058	-0.059	0.024
	(0.055)	(0.050)	(0.051)	(0.051)	(0.054)
	[-0.199]	[-0.130]	[-0.154]	[-0.156]	[0.063]
R Squared	0.35	0.37	0.38	0.39	0.45
Number of Observations	5,781	5,781	5,781	5,781	5,781
D. Log (Real Total Food Expenditures)					
County FSP Implemented	0.075*	0.091**	0.104**	0.103**	0.104*
	(0.042)	(0.044)	(0.042)	(0.042)	(0.055)
	[0.199]	[0.241]	[0.276]	[0.273]	[0.275]
R Squared	0.47	0.48	0.48	0.51	0.55
Number of Observations	5,757	5,757	5,757	5,757	5,757
Demographics	X	X	X	X	X
1960 Cty Vars * Linear Time	X	X	X	X	X
Year Fixed Effects	X	X	X	X	X
County Fixed Effects	X	X	X	X	X
Per Capita Cty Transfers			X	X	X
Log(Real Family Income)				X	X
State x Linear Time		X	X	X	
State x Year Fixed Effects					X

Notes: Each parameter is from a separate regression of the outcome variable on a dummy variable equal to 1 if the county-year observation had a food stamp program in place by January of that year. The sample includes PSID families with children where the head is an unmarried woman with a high school education or less in interview years 1969-1972 and 1974-1978. 1973 is omitted because the food variables were not asked in that year. We end the sample in 1978 so that we do not include years after the food stamp purchase requirement was eliminated. Women living in Alaska are dropped because of missing data on food stamp program start date. All outcome variables correspond to annual measures taken as of the interview (in spring of the interview year). Demographic controls include dummies for education, number of children, number of adults, race, urban location and state level unemployment rate. 1960 county variables include percent of land in farming and percent of population black, urban, age<5, age>65 and with income less than $3,000 each interacted with a linear time trend. Per capita county transfer income comes from the BEA REIS and includes measures for public assistance (AFDC, General Assistance), medical care (Medicare, Medicaid, military), and retirement and disability benefits. Estimates are weighted using the PSID weight and clustered on county. Standard errors are in parentheses and ***, **, and * indicate that the estimates are significant at the 1%, 5% and 10% levels. The numbers in brackets [ ] inflate the estimates by the food stamp participation rate.

Table 5
Impact of Food Stamp Introduction on Family Food Expenditures
Pooling All Nonelderly Families

	(1)	(2)	(3)	(4)	(5)
A. Log(Real Expenditures on Food at Home)					
County FSP Implemented X	0.068	-0.031	-0.031	-0.035	-0.041
Group Participation Rate	(0.090)	(0.093)	(0.092)	(0.087)	(0.092)
R Squared	0.56	0.56	0.56	0.58	0.59
Number of Observations	40,007	40,007	40,007	40,007	40,007
B. Any Meals Out (0/1)					
County FSP Implemented X	-0.131*	-0.049	-0.048	-0.053	-0.056
Group Participation Rate	(0.079)	(0.080)	(0.080)	(0.081)	(0.083)
R Squared	0.26	0.27	0.27	0.29	0.30
Number of Observations	41,047	41,047	41,047	41,047	41,047
C. Log (Real Total Food Expenditures)					
County FSP Implemented X	0.215***	0.193**	0.195**	0.187**	0.195**
Group Participation Rate	(0.082)	(0.084)	(0.083)	(0.077)	(0.079)
R Squared	0.52	0.52	0.52	0.57	0.57
Number of Observations	40,787	40,787	40,787	40,787	40,787
Demographics	X	X	X	X	X
1960 Cty Vars * Linear Time	X	X	X	X	X
Year Fixed Effects	X	X	X	X	X
County Fixed Effects	X	X	X	X	X
Group Fixed Effects	X	X	X	X	X
Group * linear time	X	X	X	X	X
Per Capita Cty Transfers			X	X	X
Log(Real Family Income)				X	X
State x Linear Time		X	X	X	
State x Year Fixed Effects					X

Notes: Each parameter is from a separate regression of the outcome variable on the Food Stamp implementation dummy multiplied by a group food stamp participation rate. The food stamp implementation dummy equals one if the county-year observation had a food stamp program in place by January of that year. The group food stamp participation rate is calculated for each education-race-marital status-presence of children cell using the 1976-1978 PSID. The estimation sample includes all PSID families with nonelderly heads in interview years 1969-1972 and 1974-1978. 1973 is omitted because the food variables were not asked in that year. We end the sample in 1978 so that we do not include years after the food stamp purchase requirement was eliminated. Observations for families living in Alaska are dropped because of missing data on food stamp program start date. All outcome variables correspond to annual measures taken as of the interview (in spring of the interview year). Demographic controls include dummies for education, number of children, number of adults, race, urban location and state level unemployment rate. 1960 county variables include percent of land in farming and percent of population black, urban, age<5, age>65 and with income less than $3,000 each interacted with a linear time trend. Per capita county transfer income comes from the BEA REIS and includes measures for public assistance (AFDC, General Assistance), medical care (Medicare, Medicaid, military), and retirement and disability benefits. Estimates are weighted using the PSID weight and clustered on county. Standard errors are in parentheses and ***, **, and * indicate that the estimates are significant at the 1%, 5% and 10% levels. The numbers in brackets [ ] inflate the estimates by the food stamp participation rate.

Table 6
Impact of Food Stamp Introduction on Family Food Expenditures
Specification Test: White High Educated Married Couples with Children

	Any Food Stamps (0/1)	Log of Real Expenditures on Food at home	Any Meals Out (0/1)	Log of Real Total Food Expenditures
County FSP Implemented	0.003	-0.011	-0.052	-0.078
	(0.005)	(0.049)	(0.047)	(0.050)
R Squared	0.35	0.69	0.37	0.67
Number of Observations	1,955	1,954	1,955	1,955
Demographics	X	X	X	X
1960 Cty Vars * Linear Time	X	X	X	X
Year Fixed Effects	X	X	X	X
County Fixed Effects	X	X	X	X
Per Capita Cty Transfers	X	X	X	X
Log(Real Family Income)	X	X	X	X
State x Linear Time	X	X	X	X

Notes: Each parameter is from a separate regression of the outcome variable on a dummy variable equal to 1 if the county-year observation had a food stamp program in place by January of that year. The sample includes PSID families with children where the head is white married man with a college education or more in interview years 1969-1972 and 1974-1978. 1973 is omitted because the food variables were not asked in that year. We end the sample in 1978 so that we do not include years after the food stamp purchase requirement was eliminated. Families in Alaska are dropped because of missing data on food stamp program start date. All outcome variables correspond to annual measures taken as of the interview (in spring of the interview year). Demographic controls include dummies for education, number of children, number of adults, race, urban location and state level unemployment rate. 1960 county variables include percent of land in farming and percent of population black, urban, age<5, age>65 and with income less than $3,000 each interacted with a linear time trend. Per capita county transfer income comes from the BEA REIS and includes measures for public assistance (AFDC, General Assistance), medical care (Medicare, Medicaid, military), and retirement and disability benefits. Estimates are weighted using the PSID weight and clustered on county. Standard errors are in parentheses and ***, **, and * indicate that the estimates are significant at the 1%, 5% and 10% levels.

Table 7: Impact of Food Stamp Introduction on Family Food Expenditures
Specification Tests: Low Educated Female Headed Households with Children

	Any Food Stamps (0/1)	Log(Real Exp. Food at home)	Any Meals Out (0/1)	Log(Real Total Food Exp)
A. Drop allocated observations				
County FSP Implemented	0.222***	0.037	-0.074	0.099**
	(0.040)	(0.051)	(0.051)	(0.043)
R Squared	0.45	0.52	0.40	0.54
Number of Observations	5,692	5,258	5,738	5,398
B. Drop outliers (food exp/income>0.85) and observations with zero food expenditures or money income				
County FSP Implemented	0.224***	0.024	-0.057	0.086**
	(0.041)	(0.052)	(0.054)	(0.042)
R Squared	0.47	0.54	0.40	0.55
Number of Observations	5,512	5,303	5,512	5,512
C. Allow treatment to vary with time				
County FSP Implemented	0.230***	0.017	-0.053	0.102**
	(0.040)	(0.051)	(0.051)	(0.042)
County FSP Implemented * Year>=1973	0.027	0.097	-0.354***	0.007
	(0.070)	(0.143)	(0.088)	(0.134)
R Squared	0.45	0.52	0.39	0.51
Number of Observations	5,781	5,528	5,781	5,757
D. Two year lead of treatment effect				
2-year lead of County FSP Implemented	0.008	0.147**	0.072	0.149*
	(0.043)	(0.067)	(0.064)	(0.064)
R Squared	0.44	0.52	0.39	0.51
Number of Observations	5,781	5,538	5,781	5,757
Demographics	X	X	X	X
1960 Cty Vars * Linear Time	X	X	X	X
Year Fixed Effects	X	X	X	X
County Fixed Effects	X	X	X	X
Per Capita Cty Transfers	X	X	X	X
Log(Real Family Income)	X	X	X	X
State x Linear Time	X	X	X	X

Notes: Each parameter is from a separate regression of the outcome variable on a dummy variable equal to 1 if the county-year observation had a food stamp program in place by January of that year. The sample includes PSID families with children where the head is an unmarried woman with a high school education or less in interview years 1969-1972 and 1974-1978. 1973 is omitted because the food variables were not asked in that year. We end the sample in 1978 so that we do not include years after the food stamp purchase requirement was eliminated. Women living in Alaska are dropped because of missing data on food stamp program start date. All outcome variables correspond to annual measures taken as of the interview (in spring of the interview year). Demographic controls include dummies for education, number of children, number of adults, race, urban location and state level unemployment rate. 1960 county variables include percent of land in farming and percent of population black, urban, age<5, age>65 and with income less than $3,000 each interacted with a linear time trend. Per capita county transfer income comes from the BEA REIS and includes measures for public assistance (AFDC, General Assistance), medical care (Medicare, Medicaid, military), and retirement and disability benefits. Estimates are weighted using the PSID weight and clustered on county. Standard errors are in parentheses and ***, **, and * indicate that the estimates are significant at the 1%, 5% and 10% levels.

Table 8
Impact of Food Stamp Introduction on Family Transfer Income (2003 dollars)
All Low Educated Female Headed Households with Children

	(1)	(2)
A. Real AFDC Income		
County FSP Implemented	-375.3	-275.4
	(385.8)	(384.4)
R Squared	0.42	0.43
Number of Observations	6,383	6,383
Mean of dependent variable	$2,912	$2,912
B. Real Other Welfare Income		
County FSP Implemented	-66.1	-97.5
	(329.4)	(323.9)
R Squared	0.23	0.23
Number of Observations	5,791	5,791
Mean of dependent variable	$865	$865
C. Real Social Security Income		
County FSP Implemented	548.6	516.0
	(474.9)	(478.9)
R Squared	0.38	0.39
Number of Observations	5,791	5,791
Mean of dependent variable	$2,193	$2,193
Demographics	X	X
1960 Cty Vars * Linear Time	X	X
Year Fixed Effects	X	X
County Fixed Effects	X	X
Per Capita Cty Transfers		X
State x Linear Time	X	X

Notes: Each parameter is from a separate regression of the outcome variable on a dummy variable equal to 1 if the county-year observation had a food stamp program in place by January of the year prior to the interview year. The sample includes PSID families with children where the head is an unmarried woman with a high school education or less in interview years 1969-1978. We end the sample in 1978 so that we do not include years after the food stamp purchase requirement was eliminated. Families in Alaska are dropped because of missing data on food stamp program start date. All outcome variables correspond to annual measures for the year prior to the interview and are expressed in real 2003 dollars. Demographic controls include dummies for education, number of children, number of adults, race, urban location and state level unemployment rate. 1960 county variables include percent of land in farming and percent of population black, urban, age<5, age>65 and with income less than $3,000 each interacted with a linear time trend. Per capita county transfer income comes from the BEA REIS and includes measures for public assistance (AFDC, General Assistance), medical care (Medicare, Medicaid, military), and retirement and disability benefits. Estimates are weighted using the PSID weight and clustered on county. Standard errors are in parentheses and ***, **, and * indicate that the estimates are significant at the 1%, 5% and 10% levels.

Table 9
Impact of Food Stamp Introduction on Labor Supply and Income
Low Educated Female Headed Household with Children

	Head Any Work (0/1)	Head Annual Hours Worked	Head Real Annual Earnings (2003$)	Log of Real Family Money Income (2003$)
A. All Races				
County FSP Implemented	-0.064	-141.6**	-706.1	-0.043
	(0.039)	(71.0)	(857.3)	(0.044)
R Squared	0.35	0.43	0.47	0.48
Number of Observations	6,996	6,996	6,996	6,996
Mean of dependent variable	0.67	997	$11,958	10.11
A. Nonwhites				
County FSP Implemented	-0.031	-100.2	384.9	-0.008
	(0.040)	(70.8)	(729.4)	(0.054)
R Squared	0.34	0.38	0.36	0.40
Number of Observations	5,410	5,410	5,410	5,410
Mean of dependent variable	0.59	812	$8,713	9.86
Demographics	X	X	X	X
1960 Cty Vars * Linear Time	X	X	X	X
Year Fixed Effects	X	X	X	X
County Fixed Effects	X	X	X	X
Per Capita Cty Transfers	X	X	X	X
State x Linear Time	X	X	X	X

Notes: Each parameter is from a separate regression of the outcome variable on a dummy variable equal to 1 if the county-year observation had a food stamp program in place by January of the year prior to the interview year The sample includes PSID families with children where the head is an unmarried woman with a high school education or less in interview years 1969-1978. We end the sample in 1978 so that we do not include years after the food stamp purchase requirement was eliminated. Families in Alaska are dropped because of missing data on food stamp program start date. All outcome variables correspond to annual measures for the year prior to the interview and all dollar amounts are expressed in real 2003 dollars. Demographic controls include dummies for education, number of children, number of adults, race, urban location and state level unemployment rate. 1960 county variables include percent of land in farming and percent of population black, urban, age<5, age>65 and with income less than $3,000 each interacted with a linear time trend. Per capita county transfer income comes from the BEA REIS and includes measures for public assistance (AFDC, General Assistance), medical care (Medicare, Medicaid, military), and retirement and disability benefits. Estimates are weighted using the PSID weight and clustered on county. Standard errors are in parentheses and ***, **, and * indicate that the estimates are significant at the 1%, 5% and 10% levels. The numbers in brackets [ ] inflate the estimates by the food stamp participation rate.

Table 10
Impact of Food Stamp Introduction on Labor Supply and Family Income
1960, 1970, 1980 Census STF Analysis

	Labor Force Participation Rate			Family Income >$10,000 (1979$)
	Females 16 and over	Males 16 and over	Females with children<6	
A. All races				
County FSP Implemented	0.001 (0.003)	0.002 (0.002)	0.002 (0.003)	0.005 (0.003)
Number of Observations	7,500	7,500	7,500	7,500
Mean of dep variable	0.35	0.73	0.33	0.35
B. Nonwhites				
County FSP Implemented	0.006 (0.006)	0.002 (0.006)	n/a	0.012 (0.010)
Number of Observations	7,029	7,029	n/a	7,029
Mean of dep variable	0.38	0.65	n/a	0.52
1960 County Vars * Decade	X	X	X	X
Decade Fixed Effects	X	X	X	X
County Fixed Effects	X	X	X	X

Notes: Each parameter is from a separate regression of the outcome variable on a dummy variable equal to 1 if the county-year observation had a food stamp program in place in that year. Data is from 1960-1980 Census county level STF files. Counties in Alaska are dropped because of missing data on food stamp program start date. 1960 county variables include percent of land in farming, percent of population black and percent of population urban each interacted with census year dummies. Estimates are weighted using the county population.

Appendix Table 1
Descriptive Statistics for Analysis Using the 1960 City and County Data Book

	Mean	Std Dev	Min	Max
Food stamp start date	100.4	37.7	25	175
Percent of land in farming	44.6	29.0	0	100
Percent of population with income less than $3,000	21.4	13.3	2.1	80.8
Percent of population urban	70.2	29.0	0	100
Percent of population black	10.5	12.3	0	83.4
Percent of population age <5	11.3	1.5	4.7	20.4
Percent of population >65	9.3	2.6	1	24.9
Number of Observations	2,823			

Notes: County level data from the 1960 City and County Data Book merged with food stamp start date. Food stamp start date is equal to the calendar month (normed to 0 in January 1961) that the county began offering the Food Stamp Program. Sample includes all counties present in 1960 except for Alaska which are dropped due to missing data on the food stamp program. We also drop very small counties (with population less than 1,000) because of missing data and counties with percent of land in farming greater than 100 percent. Statistics are weighted using the 1960 population in the county.