U.S. Food and Nutrition Programs

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Introduction

TO BE ADDED

To discuss in the brief introduction:

- Goals of FANPs: primary: adequate nutrient intakes; secondary (for some programs): improved nutritional choices
- Cite statistics about food insecurity (number of households, number of children, shares)
- Overview of programs to be surveyed: FSP, WIC, NSLP, SBP with a quick recap of each program what is does, who it serves, how much it costs when it started.
- Range in the "inkindedness" of the programs
- Outcome variables; empirical challenges to causal identification (FARNPs are federal)
- Evolving nature of needs: from "Hunger in America" in 1968 to obesity epidemic and food insecurity in the present time.
- Our decision to nonelderly (in SNAP) to be consistent across the populations considered.

1. History of the programs and rules

Table 1.1 provides a brief overview of the four food and nutrition programs that we study in this chapter: Food Stamps (or SNAP), Supplemental Nutrition Program for Women, Infants and Children (WIC), National School Lunch Program, and School Breakfast Program. While all of the programs share the goal of assuring adequate nutritional intake among at risk populations, the programs differ in terms of the population served, and the nature of the program provided. Food Stamps is the largest program, where in 2013 it reached an average of 47.6 million persons at a total annual cost of 79.6 billion dollars. It is the most unrestricted, using a debit card to facilitate purchases of most food items in the grocery store and extending benefits to the broadest population. WIC, on the other hand, is highly prescribed, providing eligible individuals with vouchers to purchase very specific bundles. Additionally, the program is highly targeted—extending benefits to pregnant and post-partum women, infants and children under five. In 2013, WIC served 2 million women and 6.6 million children for a cost of 6.4 billion dollars. The school lunch and breakfast programs provide free and reduced price meals to eligible school aged children. In 2013, the lunch program served 21.5 million children at a total cost of 11.1 billion dollars and the breakfast program served 11.2 million children at a total cost of 3.5 billion dollars.

1.1 Program History and Rules: The Food Stamp Program

Overview of Program

Food Stamps has features consistent with traditional means tested transfer programs. Eligible families and individuals must satisfy income and asset tests. Further, benefits are assigned using maximum benefits and benefits are reduced by a benefit reduction rate (or tax rate) as earned income increases. The similarities with other U.S. means tested programs end there.

First, unlike virtually all means tested programs in the U.S., food stamp eligibility is not limited to certain targeted groups such as families with children, aged, and the disabled.[1] Second, food stamps is a federal program with all funding (except 50 percent of administrative costs) provided by the federal government and with little involvement and few rules set by the states. Third, the income eligibility threshold and benefits are adjusted for changes in prices each year.[2] Fourth, the benefit reduction rate is relatively low (30%) and the program serves the working and nonworking poor. The universal eligibility (eligibility depends only on need) combined with the fact that benefits and caseloads rise freely with need (e.g. in recessions) have elevated Food Stamps to its status as the fundamental safety net in the U.S.

Benefits are paid out as vouchers that can be used to purchase most foods at grocery stores that are designed to be taken home and prepared. In other words, most grocery store foods can be purchased with the exceptions of goods such as hot foods intended for immediate

[1] The program is not quite universal: undocumented immigrants are not eligible for SNAP.
[2] Benefits are tied to the cost of a "market basked of foods which if prepared and consumed at home, would provide a complete, nutritious diet at minimal cost", the so-called Thrifty Food Plan, and then indexed for increases in prices.

consumption, vitamins, paper products, pet foods, alcohol and tobacco. Starting in the late 1980s and completed by 2004, states transitioned to electronic benefit delivery, eliminating the use of paper vouchers. In 2008, the program was renamed the Supplemental Nutrition Assistance Program or SNAP, and different states now have different names for the program.

Eligibility and Benefits

The food stamp program, like other safety net programs, is designed to insure a basic level of consumption in low-income families. Consequently, benefits in traditional income support programs feature a guarantee—a benefit level if the family has no income. As earnings or income increases, benefits are reduced leading to an implicit tax rate on earnings (called the benefit reduction rate or BRR).

Unlike most means-tested benefit programs in the U.S., SNAP is broadly available to almost all households with low incomes. The eligibility rules and benefit levels vary little within the U.S., and are largely set at the federal level. (See discussion in the second below for some recent exceptions to this.). Eligible households must meet three criteria: gross monthly income does not exceed 130 percent of the poverty line, net income (income after deductions) does not exceed the poverty line, and assets do not exceed $2,000 (or $3,250 for elderly, disabled). Additionally, most non-working childless adults are limited to three months of benefits within a three-year period. The eligibility unit is the "household unit" and consists of people who purchase and prepare food together. After initial eligibility, households must be recertified every 6 to 24 months.

A stylized version of the benefit formula is presented in Figure 1.1 for a family of a fixed size. A key parameter of the formula is the cost of food under the USDA's Thrifty Food Plan, which we also term the "needs standard." The maximum SNAP benefit (the horizontal line in the figure) amount is typically set equal to the needs standard.[3] SNAP is designed to fill the gap between the cash resources available to a family to purchase food and the needs standard. A family with no income receives the maximum benefit amount, and is expected to contribute nothing out-of-pocket to food purchases. Thus, total food spending (depicted by the upward sloping line "hypothetical food spending") equals maximum benefits for a family with no other income source. As a family's income increases, they are expected to be able to spend more of their own cash on food purchases, and consequently SNAP benefits are reduced accordingly. The slope of the SNAP benefits line in Figure 1.1 is the BRR and is currently set at 0.3. The benefit formula is thus:

$$\text{Benefits} = \text{Max\_Benefit} - 0.3*(\text{Net\_Income}) \quad (1)$$

The SNAP benefit line as a function of net family income is thus the downward sloping line on the figure. Finally, the family's out-of-pocket spending on food is the vertical distance between the SNAP benefits line and the food spending line.

[3] Congress can set maximum benefits equal to some multiple of the needs standard. For example, the American Recovery and Reinvestment Act of 2009 temporarily raised maximum benefits to be 113.6 percent of the needs standard.

Net income is calculated as cash pre-tax income less the following deductions: a standard deduction, a deduction of some of the earned income, an excess shelter cost deduction, a deduction for childcare costs associated with working/training, and a medical cost deduction that is available only to the elderly and disabled. Because of these deductions, in practice the benefit reduction rate (the effective tax rate) out of gross income is lower than 0.3. Notably, the income measures used for SNAP eligibility use a *cash pre-tax* measure and therefore do not include in-kind benefits (e.g. housing assistance) or tax credits including the EITC or the Child Tax Credit.

Central policy issues include whether the needs standard is set at an appropriate level, and whether the benefit reduction rate is appropriate. It is worth pointing out that this 0.3 benefit reduction rate – which in practice is somewhat lower because of deductions included in the net income calculation – is much lower than that experienced by other safety net programs such as disability and TANF.

History, Reforms, and Policy Changes

Currie (2003) provides a detailed history of Food Stamps. We briefly touch on some of the important elements of the history and discuss more recent policy changes.

The modern Food Stamp Program began with President Kennedy's 1961 announcement of a pilot food stamp program that was to be established in eight impoverished counties. 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, which gave local areas the authority to start up the Food Stamp Program in their county. As with the current FSP, the program was federally funded and benefits were redeemable at approved retail food stores. In the period following the passage of the Food Stamp Act, there was a steady stream of counties initiating Food Stamp Programs and Federal spending on the FSP more than doubled between 1967 and 1969. Support for requiring counties to participate in FSP 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.[4]

Figure 1.2 plots the percent of counties with a FSP from 1960 to 1975.[5] During the pilot phase (1961-1964), FSP coverage increased slowly. Beginning in 1964, Program growth accelerated; coverage expanded at a steady pace until all counties were covered in 1974. There was substantial heterogeneity in timing of adoption of the FSP, both within and across states. The map in Figure 1.3 shades counties according to date of FSP adoption (darker shading denotes a later start-up date).

Compared to the dramatic reforms (AFDC) and expansions (EITC) of income support programs that characterize the last two decades, Food Stamps has remained fairly stable over

[4] Prior to the Food Stamp program, some counties provided food aid through the 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. The CDP was far from a universal program. It never reached all counties. The food basket contained a limited range of products, the distribution was infrequent, and distribution centers were difficult to reach.

[5] Counties are weighted by their 1970 population. Note this is not the food stamp caseload, but represents the percent of the U.S. population that lived in a county with a FSP.

time. A major change took place in the 1977 Food Stamp Act reauthorization with the elimination of the purchase requirement. Prior to this law change, families were required to make an upfront cash payment (a "purchase requirement") to receive the food stamp benefits. The presence of (or elimination of) this feature did not change the magnitude of the benefits a family received[6] yet food stamp caseloads increased substantially after the removal of the purchase requirement.

The 1996 welfare-reform legislation left Food Stamp rules relatively unaffected but did limit benefits for legal immigrants (who were deemed ineligible until they accumulated 10 years of work history) and able-bodied adults without dependents 18-49 (who were typically limited to 3 months of benefits in a 3 year period)[7]. A 1998 agriculture bill restored food stamp eligibility to some legal immigrant children, disabled persons, the blind, and the elderly (those who had arrived in the U.S. prior to welfare reform). Later, the 2002 Farm Bill restored food stamp eligibility to all legal immigrant children and disabled persons, regardless of their time resident in U.S., and to legal immigrant adults in the country for five or more years.

Beginning with regulatory changes in 1999 and continuing with the 2002 Farm Bill, the USDA has allowed states to implement waivers aimed at improving access to benefits, particularly for working families. This comes from the observation that the process of signing up for Food Stamps takes considerable time and, in particular for working families, getting to the welfare office can be a significant barrier to access to the program. This has led to redesigning income reporting requirements (reducing recertification intervals, reducing income reporting between recertification), moving away from in-person meetings for determining eligibility (instead using call centers and online applications) as well as relaxing of asset requirements (vehicle ownership). Additionally, during this time states also expanded "broad based categorical eligibility" (U.S. GAO 2007) whereby states were allowed to eliminate net income test and asset test and raise the gross income test. However, the benefit formula remained fixed (as the maximum benefit less 30% of net income); this implies that any expanded eligibility would be for those with large deductions to gross income (such as fathers paying child support).

The American Recovery and Reinvestment Act of 2009 (federal stimulus or ARRA) led to a 13.6 percent increase in the maximum Food Stamp benefit (though October 2013) and also suspended the three-month time limit on able-bodied childless adults temporarily.

1.2 Program History and Rules: WIC

[6] That is, if the family was deemed able to afford to spend $60 on food, but the cost of the thrifty food plan was $80, the family could purchase $80 in food stamps for the cash price of $60. Under today's program, a similar family would receive simply receive $20 in food stamps and would not have to outlay any cash.

[7] As discussed in Bitler and Hoynes (2014), prior to welfare reform, there was a "bright line" that distinguished between legal immigrants and unauthorized residents in determining eligibility for safety net programs. Legal immigrants were eligible for most safety net programs on the same terms as citizens while unauthorized immigrants were not. There were exceptions: unauthorized immigrants maintained eligibility for free and reduced price School Lunch and Breakfast, WIC, emergency Medicaid, and state funded emergency programs. In addition, refugees and asylum seekers also sometimes faced different rules than others. Finally, in response to the post-welfare reform reductions in immigrant eligibility for food stamps, many states chose to maintain coverage for legal immigrants with state-funded replacement coverage (known as "fill in" programs).

Overview of Program

The goal of the Supplemental Nutrition Program for Women, Infants, and Children (WIC) is to improve the nutritional well-being of low income pregnant and postpartum women, infants, and children under the age of five who are at nutritional risk by providing nutritious foods to supplement diets, nutrition education, and referrals to health care and social services. More specifically the program aims to improve birth outcomes, support the growth and development of infants and children, and promote long-term health in all WIC participants.

Eligibility and Benefits

Eligibility for WIC requires satisfying categorical eligibility and income eligibility requirements. Five types of individuals are eligible for WIC (categorical eligibility): pregnant women, post-partum women with a child under six months, breastfeeding women with a child under 12 months, infants and children under age five. Income eligibility dictates that participants must live in households with family incomes below 185 percent of the poverty line or become eligible through participation in another welfare program such as Medicaid, Temporary Assistance to Needy Families, or Food Stamps. Immigrants are eligible for WIC under the same rules as natives. Additionally, participants must be deemed to be at nutritional risk; and risk factors include low maternal weight gain, inadequate growth in children, anemia, dietary deficiencies, and other nutritional related medical conditions.[8] However, virtually all financially eligible persons appear to satisfy this requirement (Ver Ploeg and Betson, 2003). After initial eligibility, recertification is required every 6 months.[9] Like Food Stamps, WIC benefits take the form of voucher and many states use debit cards for distributing benefits.

WIC benefits differ from Food Stamp benefits in two key ways. First, the WIC benefit does not vary with countable income, there is no "benefit reduction rate" that reduces the benefit as countable income rises. Instead, as with programs such as Medicaid, if you are income and categorically eligible you receive the full WIC benefit. Second, the WIC bundle is restricted to specific items; the WIC approved foods must contain protein, calcium, iron, and Vitamins A and C. The approved foods include juice, fortified cereal, eggs, cheese, milk, dried beans, tuna, and carrots. Post-partum women have access to free infant formula and (in later years of the program) breastfeeding services. Table 1.2 summarizes the current elements of the food package and the specified maximum monthly allowance of WIC foods (separately for each eligibility group). For example, children ages one to four receive vouchers for juice (128 fl oz), milk (16 quarts), breakfast cereal (36 oz), eggs (one dozen), whole wheat bread (2 lbs), legumes/peanut butter and $8 toward fruits and vegetables. Infants are eligible for formula (if not breast fed), infant cereal and baby food.

This discussion makes clear that WIC then is really a "quantity" voucher and thus households do not face price incentives for these goods. In part to address this, WIC rules limit purchases to the cheapest available items (e.g. store brands) in the authorized grocery outlet. An important special case of this is for infant formula, which is a large part of the WIC bundle. In

[8] Risk factors can also include homelessness and migrancy, drug abuse and alcoholism.
[9] Pregnant women are certified throughout their pregnancy and through 6 weeks postpartum. Infants are certified through age 1.

2012, spending on formula for WIC totaled almost 2 billion dollars out of a total program cost of 6.8 billion (Oliveira et al 2013). Under current regulations, state WIC agencies typically award a contract to a single manufacturer of infant formula in exchange for a rebate for each can of infant formula purchased by WIC participants. These rebates are very high, ranging from 77 to 98 percent. The formula market is highly concentrated--with only three firms—and more than half of all formula sold in the U.S. goes to WIC participants (Oliveira et al 2013).

Importantly WIC is not an entitlement program; SNAP on the other hand has been a fully funded entitlement since the program went national in 1975. Congress makes appropriates for WIC which in principle could lead to limits in the number of people that can be served. In recent times, these allocations have been sufficient to meet demand for the program and thus in practice it has operated as an entitlement program.

WIC has an unusual administrative structure that operates at the Federal, State and local levels. The program is federally funded and operated through the USDA. The USDA provides grants to support food benefits, nutrition services, and administration to 88 WIC agencies (covering the 50 states, Washington DC, U.S. territories, and Indian Tribal Organizations). State agencies pay for program operations in their jurisdiction. The State agencies then contract with local WIC sponsoring agencies located primarily in State and county health departments. These local sponsoring agencies then provide benefits directly or through local services sites at community health centers, hospitals, schools, mobile vans, and other locations.

The state can choose from three food delivery system models. Most WIC participants access the food packages by redeeming vouchers at participating retail outlets. Alternatively, some state agencies purchase the items in bulk and make available through distribution centers or through home delivery.

History, Reforms, and Policy Changes

Currie (2003) provides a detailed history of WIC. We briefly touch on some of the important elements of the history and discuss more recent policy changes.[10]

The WIC program was first established as a pilot program in 1972 as an amendment to the Child Nutrition Act of 1966. The program was developed in direct response to policy recommendations highlighting health deficits among low-income individuals that might be reduced by improving their access to food. It was further recognized that, by providing food at "critical times" to pregnant and lactating women and young children, it might be possible to prevent a variety of health problems (Oliveira, et al. 2002). The program became permanent in 1975. WIC was intended to supplement food stamp benefits and the authorizing legislation specifically did not preclude a person from WIC participation if they were already receiving food stamps.

WIC sites were established in different counties between 1972 and 1979, with legislation requiring that the program be implemented first in "areas most in need of special supplemental food" (Oliveira, et al. 2002). The first WIC program office was established in January 1974 in

[10] Much of this section is drawn on Oliveira et al (2002).

Kentucky, and had expanded to include counties in 45 states by the end of that year.[11] Figure 1.4 shows the percent of counties with WIC programs in place, weighted by the county population. The graph shows steady expansion in the program between, particular between the years of 1974-1978.

For the first 30 plus years of the program, there was little change in the WIC food package. The food packages throughout this period included a very limited number of items: juice, infant cereal, milk, cheese, eggs, dried beans, peanut butter, canned tuna and fresh carrots. The only major change to the food package in this period was in 1992 with the addition of an enhanced WIC food package for breastfeeding mothers. This was part of a growing desire to encourage breast feeding among the WIC population.

More recently, there has been a growing view that this very narrow food packet does not adequately meet current dietary guidelines. Additionally, concerns grew about significant changes in the food supply at grocery outlets and the growing prevalence of obesity. The Food and Nutrition Service set a goal to determine cost-neutral changes to WIC food packages based on information about the nutrition needs of WIC participants. This led to a report by the Institute of Medicine (IOM 2005), largely adopted as an interim rule in 2007 and adopted as law in 2014. The IOM report identified that nutrients such as iron, vitamin E, potassium, and fiber should increase and the packages should provide more access to fruits and vegetables. Particular attention was aimed at encouraging breast feeding, through expanding the food package for breast feeding mothers. The modified rules added flexible vouchers for fruit and vegetables (e.g. $8.00 per month for a child. $10.00 for pregnant and breastfeeding women), decreases in juice and milk, expanding to milk alternatives (cheese, yogurt, tofu) and the addition of whole grains. Table 1.2, as presented above, describes this recently adopted policy on the WIC food bundle.

1.3 Program History and Rules: National School Lunch Program

Overview of Program

The school lunch program provides Federal cash and commodity support for meals served to children at public and private schools, and other qualifying institutions. There is a three-tiered system based on a child's household income that determines the level of Federal payments made to schools, and typically also determines the price charged to the student for lunch.

Schools receive both cash and in-kind payments for meals served. In 2013-14, schools received Federal cash subsidies equal to $2.93 per free lunch, $2.53 per reduced-price lunch, and $0.28 per paid lunch.[12] If the share of free or reduced-price lunches served at the school (in a base year two years prior to the current year) exceeds 60 percent, then per-meal cash subsidies are increased by 2 cents per meal. As described below, schools are also eligible for additional payments of 6 cents per meal if they document that their lunches meet nutritional guidelines. In addition, schools receive commodity foods worth $0.2325 for each lunch served, regardless of

[11] Participation in the commodity distribution program, however, disqualified individuals from WIC participation (Oliveira, et al., 2002). But the CDP was being phased out during the 1970s as the FSP expanded to a national program.

[12] Payment levels are higher in Alaska and Hawaii.

the price charged. Schools may also receive bonus commodities from USDA's purchase of surplus commodities if they are available.

History, Reforms, and Policy Changes

Predecessors to the National School Lunch Program (NSLP) date back to the Great Depression, when the government began to distribute surplus farm commodities to schools with large populations of malnourished students. In 1946 Congress passed the National School Lunch Act (Gunderson 1971, see also Table 1.3). The act's statement of purpose indicates that a nonprofit school lunch program should be established "as a measure of national security" with the dual purposes "to safeguard the health and well-being of the Nation's children and to encourage the domestic consumption of nutritious agricultural commodities and other food…" Under the Act, commodities were distributed and cash payments were made to states according to a formula that was a function of per-capita income and population. The NSLP was significantly amended in 1962 to adjust the funding formula to become a function of both the program participation rate and the "assistance need rate" that was a function of the state's average per capita income (Hinrichs, 2010).

In recent years there have been legislative changes both regarding payment formulas and nutrition standards. In terms of payment formulas, there have been several recent efforts to reduce administrative costs for the payment process. One such effort is the Community Eligibility Provision (CEP), which began in the 2014-15 school year. This provision allows schools to provide free meals to all of its students if they can document that at least 40 percent of their students are categorically eligible for free meals (through participation in SNAP, TANF, FDPIR, or because they are foster, homeless, runaway or migrant children). If a school opts for the CEP, the Federal government reimburses X percent of school meals at the free rate, where X equals 1.6 times the share of students who are categorically eligible at the school. Remaining meals served are reimbursed at the paid-lunch rate, and schools must cover any shortfall between costs and reimbursements with non-federal funds. Under the CEP, a school must provide both breakfast and lunch free to all students.

Two alternatives allow schools to serve free meals to all students enrolled at the school, while only requiring documentation of free or reduced-price eligibility every four years. The first allows a school to determine the fraction of meals it serves at each price tier during one base year, then applies the same ratio of reimbursement rates to all meals served for the following three years. Under the second option, a school counts meals served by type during the base year, and then may receive the same level of cash payments and commodities in the subsequent three years regardless of the number of meals served. Under these provisions, a school may decide to provide lunch, breakfast, or both meals for free to all students. In part in response to these administrative alternatives, the share of schools offering universal free lunches has increased.

The 2010 Healthy, Hunger-Free Kids Act made major changes to nutrition standards for school lunches, as shown in Table 1.4. Under prior nutrient standards, schools were required to serve at least a minimum number of calories per meal, and the standard varied by student age from 633 in grades K-3 to 785 in grades 4-12. Schools were also required to insure that no more than 10 percent of calories came from saturated fats. There were also requirements for minimum levels of daily fruits and vegetables, meats, grains, and milk. The 2010 Act imposed both minimum and maximum calorie rules, and for many grades set the maximum allowable calories below the previous calorie floor (see Table 1.5). It also provided stronger requirements for daily

and weekly food group servings, including weekly requirements for a variety of vegetables (such as dark green, red/orange, and starchy), restrictions on the fat content of milk, and a phased-in requirement to use only whole grain rich grains. Schools that meet these enhanced nutrition requirements receive an additional 6 cent payment per meal. In addition, the Act gave the USDA authority to set nutritional standards for all foods sold in school during the school day, including in vending machines, school stores, and a la carte lunch items. There has not yet been systematic study of the impacts of these changes on participation in the program at the individual or school level.

Benefits and Eligibility

Students are offered the same components of school lunch regardless of the price they pay for the lunch, though students are given some choice about what components they are served. Under traditional eligibility, children from households with incomes less than 130 percent of the FPL receive lunches free of charge, while those from households with incomes between 130 percent and 185 percent of the FPL are eligible for reduced-price meals (with a current maximum allowable price of $0.40). Children from households with incomes above 185 percent of the FPL may purchase so-called "paid meals," which are priced on average less than $2.50 per meal. Some children are additionally eligible for free meals based on categorical eligibility criteria, or if their school has adopted a universal free meal program. Regardless of household income, children are deemed to be categorically eligible for free meals if their family receives benefits through SNAP or the Food Distribution Program on Indian Reservations (FDPIR), or if the child is a foster, homeless, runaway or migrant. In some states, children are also categorically eligible if they receive benefits from TANF or Medicaid. The 2010 Healthy, Hunger Free Kids Act provides incentives to states that show "outstanding performance" or "substantial improvement" in directly certifying students for free meals through these methods. In addition, as described above students who are not income-eligible or categorically eligible for free meals may receive them for free if their school has adopted a universally free lunch program.

1.4 Program History and Rules: School Breakfast Program

Overview of Program

The school breakfast operates in a similar manner to the lunch program. The SBP provides Federal cash (but, unlike the NSLP, no additional commodity support) for meals served to children at public and private schools, and other qualifying institutions. The same three-tiered system based on a child's household income that determines the level of Federal payments made to schools, and typically also determines the price charged to the student.

In 2013-14, schools received Federal cash subsidies equal to $1.58 per free breakfast, $1.28 per reduced-price breakfast, and $0.28 per paid breakfast. If the share of free or reduced-price breakfasts served at the school (in a base year two years prior to the current year) exceeds 40 percent, then the school is eligibility for "severe need" payments, which increase the per-meal cash subsidies by 30 cents per meal. About three-quarters of breakfasts served in the SBP receive this "severe need" payment. Under current legislation, schools are also eligible for additional payments of 6 cents per meal if they document that their breakfasts meet nutritional guidelines.

History, Reforms, and Policy Changes

The SBP was established in 1966 as a two-year pilot program. It originally provided categorical grants to provide payments to schools that served breakfast to "nutritionally needy" students. In 1973, the program was amended to replace the categorical grant with the per-meal payment system used today. It was permanently authorized in 1975.

The 2010 Healthy, Hunger-Free Kids Act made substantial changes to breakfast standards as well. Under prior nutrient standards, schools were required to serve at least at least 554 calories at breakfast. Under the new standards, breakfast calories were required to fall within a specified range, from 350-500 for grades K-5 to 450-600 for high school students. Similar to the changes made to the lunch nutrient standards, new rules required more fruits and vegetables, restrictions on the fat content of milk, and a switch to whole grains. The Act also authorized grants that can be used to establish or expand school breakfast programs.

Benefits and Eligibility

Under traditional eligibility, children from households with incomes less than 130 percent of the FPL receive breakfasts free of charge, while those from households with incomes between 130 percent and 185 percent of the FPL are eligible for reduced-price breakfasts (with a current maximum allowable price of $0.30). Children from households with incomes above 185 percent of the FPL may purchase so-called "paid meals." The categorical eligibility criteria are the same as they are for the school lunch program.

2. Program Statistics and Recipient Characteristics

2.1 Program Statistics: the FSP

In 2013, SNAP expenditures totaled 79.9 billion dollars and served 47.6 million persons or 23.1 million households. This translates to more than one out of six people participating in the program. Average monthly benefit amount in 2013 amounted to $275 per household, $133 per person, translating to about $4.45 per person per day. Overall, SNAP is the largest cash or near-cash means tested, universal safety net program in the U.S.

Table 2.1 presents data on SNAP participation and expenditures over time. Total expenditures (in real 2013 dollars) increased from 27.5 billion in 1990 to almost 80 billion in the most recent years. Average monthly participation follows a similar path, moving from 20 million persons in 1990 to 47.6 million in 2013. The bottom of the table presents SNAP participants as a percent of the total population—it has ranged from 8.1 percent in 1990 down to 6.2 percent in 2000, to 15 percent in 2013.

Figure 2.1 plots the real per capita spending on SNAP annually from 1980 to 2013, along with grey shaded areas indicating annualized recessionary periods [coming in next draft] following Bitler and Hoynes (2014). During this period, per capita real spending on SNAP was relatively flat in the 1980s, increased in the early 1990s and then fell dramatically through the late 1990s. Since that time, spending has increased steadily. Overall the program shows a countercyclical pattern, increasing in the recessions in the early 1990s, early 2000s, and especially notable, in the Great Recession.

Table 2.2 presents summary characteristics for SNAP recipient units and how they vary over time. The top panel of the table relates to all SNAP recipients and the bottom panel limits to SNAP recipient units without any elderly (age 60 or more) individuals. These tabulations are based on administrative data from the USDA, known as the Quality Control files. In 2012, about 45 percent of SNAP recipient units have some children, down from about 60 percent in 1996. Female headed households with children are also falling over time, from 39 percent in 1996 to 24 percent in 2012. About 17 percent contain an elderly individual, and that share has not changed much over time. An increasing share of the caseload combines benefit receipt with employment. About 31 percent of households currently have earned income, a rate that is up 8 percentage points since 1996. On the other hand, some 20 percent have no cash income up from 10 percent in 1996.

Given the patchwork of U.S. means-tested programs, it is of interest to examine the propensity to participate in multiple programs, especially in light of concerns about cumulative work disincentives (Congressional Budget Office 2012, Mulligan 2012). It is also interesting to examine this over time given welfare reform and the many changes in the safety net. The food stamp quality control data (Table 2.2) tracks all resources that count as income for determining SNAP benefits, practically this translates to *cash* income programs. In 2012, only 7 percent of SNAP recipients have income from TANF, down from 37 percent in 1996 on the eve of welfare reform. The share with income from SSI and social security has stayed relatively steady; in 2012 20 percent of SNAP units had SSI and 23 percent social security. If you limit to recipient units

without elderly, the share with "social security" (which we interpret as likely SSDI) has increased, from 9 percent in 1996 to 14 percent in 2012. Few food stamp recipients have income from UI (5 percent), general assistance (3 percent) or veteran's payments (1 percent). Although, receipt of UI among SNAP recipients units is low, it did show a notable increase in the Great Recession (from 2 percent in 2005 to 7 percent in 2010).

[NEXT DRAFT – possibly include a table from Moffitt "Multiple Program Participation and the SNAP Program" with more detailed calculations from the SIPP]

[Add something on SNAP takeup and how it has changed over time. Using MPR annual report. Perhaps add to Table 2.2]

Table 2.3 presents maximum monthly SNAP benefits by household size for 2013. A household of four has a maximum monthly benefit of $668 while a household of size two has a maximum benefit of $367. Annualizing these amounts, maximum benefits corresponds to about 30 to 34 percent of the federal poverty line.

As discussed above in section 1.1, the SNAP benefit formula has changed little over time, other than adjusting for changes year to year in the price of food. Interest in the adequacy of the SNAP benefit has increased over time and led to a recent Institute of Medicine report (IOM 2013). Hoynes, McGranahan and Schanzenbach (2013) explore SNAP benefit adequacy by examining the food spending patterns across families of differing income and composition. They argue that the maximum benefit level is inappropriate on at least two fronts: the Thrifty Food Plan (TFP) is based on outdated assumptions, and the family size adjustment does not reflect differences in spending patterns. First, consider the TFP, which is set at $632 per month for a typical family of 4 in 2013. The TFP is 30 percent smaller than the USDA's "Low-Cost Food Plan", which estimates $825.70 per month to feed a family of 4. Based on an analysis of the Consumer Expenditure Survey, they show that over the past 20 years, the majority of families with incomes below 200% poverty spent more than the "target" level of food spending that the benefit formula is based upon. They show this is in part due the TFP being based on increasingly unrealistic assumptions regarding how much cooking is done from scratch. Second, they show that differences in actual spending patterns across family size are much steeper than are accounted for by the benefit multipliers. Since the average SNAP household size is 2.3, this suggests that many families are receiving benefits based on a formula that under-states their needs dramatically.

2.2 Program Statistics: WIC

In 2013, WIC expenditures totaled 6.4 billion dollars and served 8.7 million persons. Average monthly food cost per person in 2013 amounted to $43.26 or $1.44 per person per day. The WIC caseload breaks down to 2 million women (24%), 2 million infants (24%) and 4.6 million children (52%). [GET COST ON WIC PACKAGES SEPARATELY BY ELIGIBILITY GROUP. IT IS HIGHER FOR INFANTS DUE TO FORMULA.]

Table 2.1 presents data on WIC participation and expenditures over time. The WIC program has increased over this period from 4.5 million recipients in 1990 to 8.7 million in 2013. The total cost increased from 3.8 billion (2013$) in 1990 to 6.4 billion in 2013. The growth seems to be fairly similar across the subgroups of women, infants and children. The bottom of Table 2.1 presents program participation rates, where we express the number of participants as a percent of the relevant demographic group. So for example, the WIC infant (child) caseload is a percent of all persons less than 1 (between 1 and 4).[13] We express the women caseload as a share of women ages 18-44. Both infant and child caseloads have increased over this period. Fully 28. 5 percent of children aged 1-4 receive WIC in 2013, up from 13.5 percent. Participation is higher for infants, likely due to the high cost of infant formula, more than half of infants in the U.S. in 2013 received WIC benefits. In 2013, 3.6 percent of women aged 18-44 received WIC; this figure is not comparable to the others because only pregnant, postpartum and breastfeeding women are eligible for WIC.

Figure 2.2 plots the real per capita spending on WIC annually from 1980 to 2013. WIC expenditures exhibit a fairly steady rise in the 1990s, relatively flat in the 2000s, with someone of a countercyclical pattern in the Great Recession and recovery.

Table 2.4 presents summary characteristics for WIC recipient units in 2012 (the most recent year available) and, for comparison, 1994. Despite the (relatively) high income threshold of 185 percent of poverty, fully 37 percent of WIC recipients have income below 50 percent of poverty ("extreme poverty"). 73 percent have incomes below 100 percent poverty and 92 have income below 150 percent poverty. The distribution of recipients by income has not changed much between 1994 and 2012. On notable change in the caseloads is the rise of breastfeeding women, as a share of all women on the program—increasing from 17 percent in 1994 to 29 percent in 2012. We can also explore multiple program participation for the sample of WIC recipients. In 2012, only 9 percent of WIC recipients have income from TANF, down from 29 percent in 1992 (prior to welfare reform). The share with income from SNAP has stayed relatively steady; in 2012 37 percent of WIC units received SNAP compared to 40 percent in 1992. Participation in Medicaid among WIC recipients is very high in 2012, reflecting the substantial expansions in Medicaid for pregnant women and children. 72 percent of WIC recipients received Medicaid up from 58 percent in 1992.

2.3 Program Statistics: NSLP

The National School Lunch Program (NSLP) serves lunch to almost 30 million students – 57 percent of the total student population (see Table 2-1). Almost all public schools offer the NSLP, which in 2013 cost $11.1 billion and served 5.1 billion lunches. The share of students receiving school lunch for free has grown over time from 41 percent in 1990 to 62 percent in 2013. Overall, participation has edged down somewhat in the last few years from its historic peak of 59 percent in 2010.

After adjusting for inflation, spending on NSLP has almost doubled since 1990. This reflects both an increase in spending per lunch, and the increase in participation rates. The increased spending per lunch has been driven by a combination of increased costs and policy changes. Spending on child nutrition programs increases annually because payment levels are

[13] These are participation rates not takeup rates because they do not condition on income eligibility.

indexed according to the Food Away from Home series of the CPI-U. Commodity payments are inflated according to the Price Index of Foods used in Schools and Institutions. (The payments are legislated not to decrease, so if food prices decline in a year, there is no adjustment to these costs). In recent years, Food Away from Home prices have grown more quickly than for all Personal Consumption Expenditures. In addition, the 2010 Healthy Hunger-Free Kids Act increased cash payments by 6 cents per meal for schools that meet the new, more stringent nutrition requirements.

2.4 Program Statistics: SBP

There have been recent – and highly successful – attempts to expand access to the SBP. As shown in Table 2.1, between 1990 and 2013 the total number of breakfasts served more than tripled (compared to a 27 percent increase among lunches served). At the same time, the participation rate also increased sharply, from 7.6 percent to 20.6 percent of children. Some of this has been driven by increases in participation rates of schools in the program. Schanzenbach and Zaki (2014) calculate from the NHANES that in 2009-10 almost three-quarters of children attended a school that offered the SBP, up from approximately half of students in the 1988-94 wave. An additional portion has been driven by policies to expand take-up by students, including providing breakfast for free to all students before school or introducing Breakfast in the Classroom programs. In 2013, 85 percent of participants received the SBP either for free or at reduced price.

2.5 Summary measures across programs

Considering the programs together, Table 2.1 shows that SNAP is clearly the largest program—in terms of people reached or program cost. In 2013, expenditures on SNAP were 7 times larger than the NSLP and 12 times larger than WIC. The number of recipients receiving SNAP was about 2 times the NSLP and 5 times WIC. However, these comparisons ignore the fact that SNAP is universal, while NSLP and WIC are targeted on specific demographic groups. Using this lens, the figures in the bottom of Table 2.1 show that SNAP has the *smallest* reach among the programs. Half of all infants and almost 30 percent of children 1-4 receive WIC, 20 percent of school aged children receive free or reduced price breakfast and almost 40 percent receive free or reduced price lunch. SNAP, by contrast, is received by 15 percent of the population.

Figure 2.X shows how program participation for the food and nutrition programs varies by income level. In particular, the figure plots household participation in SNAP, NSLP and WIC (alongside EITC as a comparison) as a function of household private income to poverty level (truncating at eight times income to poverty).[14] The figure is based on tabulations of the 2014 Current Population Survey corresponding to data for calendar year 2013, and is limited to households with children headed by a nonelderly person. Overall, SNAP and NSLP have the highest household participation rates, with lower household participation rates for WIC. SNAP participation is most concentrated at the lower income levels, reflecting its lower income

[14] The figure is adopted using the approach in Bitler and Hoynes (2014). See that paper for details on the sample and measurement.

eligibility limits. WIC has a much flatter profile with respect to income, reflecting the higher income eligibility limits.

Figure 2.XX compares anti-poverty effects of the programs. The calculations are based on the Supplemental Poverty Measure (SPM), first released by the Census in 2011 (Short 2011). The SPM provides an alternative to the official poverty measure and is based on a comprehensive after tax and transfer income resource measure that includes the value of noncash government transfers. Here we use the 2013 SPM (Short 2014) and plot the number of children removed from poverty for all government tax and transfer programs tracked in the SPM. This is a static calculation, essentially zeroing out the income source and recalculating family income and poverty status assuming all else (e.g. earnings, other income sources) remain constant. SNAP removes 2.1 million children from poverty, second only to the combined effects of the EITC and Child Tax Credit that together remove 4.7 million children from poverty. By comparison, the NSLP removes 0.8 million children from poverty and WIC removes 0.3 million children from poverty.[15]

[15] With underreporting of SNAP and other food and nutrition programs, these are underestimates of the total antipoverty effects (Tiehen, Jolliffe, Smeeding 2013)

3. Review of the issues surrounding the programs

TO BE ADDED

Start with a big picture economic framing of the issues

These programs have a range of "inkindness" [SNAP – WIC – NSLP]

Usual issue of balancing protection versus distortion

What are the "protections" the programs are aiming for

What are the distortions we are concerned about: labor supply, food diet choices

We start with a discussion of SNAP because that is the most important program and where most of the work is. Then we end up with shorter sections on any issues relevant to the particular programs.

3.1 Effects of in-kind benefits on food consumption

We begin by presenting the neoclassical model of consumer choice and use this to discuss predictions for the effects of SNAP on family spending patterns.[16] Figure 3.1A presents the standard Southworth (1945) model, in which a consumer chooses to allocate a fixed budget between food and all other goods. The slope of the budget line is the relative price of food to other goods. In the absence of SNAP, the budget constraint is represented by the line AB. When SNAP is introduced, it shifts the budget constraint out by the food stamp benefit (divided by food price) B_F/P_F to the new budget line labeled ACD. The first, and most important, prediction of the neoclassical model is that the presence of, or increase in the generosity of, the SNAP transfer leads to a shift out in the budget constraint. The transfer does not alter the relative prices of different goods, so can be analyzed as a pure income effect, and predicts an increase in the consumption level of all normal goods. Thus, the central prediction is that food stamps, like an increase in disposable income or a cash transfer, will increase food spending and non-food spending.

However, SNAP benefits are provided as a voucher that only can be used toward food purchases. Canonical economic theory predicts that in-kind transfers like SNAP are treated as if they are cash as long as their value is no larger than the amount that a consumer would spend on the good if she had the same total income in cash. Returning to Figure 3.1A, there is a portion of the budget set that is not attainable with SNAP that would be attainable with the cash-equivalent value income transfer. In other words, because the benefits B_F are provided in the form of a food voucher, this amount is not available to purchase other goods, and thus we would expect a consumer to purchase at least B_F amount of food. Thus paying benefits in the form of a food voucher leads to a budget constraint with a kink point.

Figure 3.1B illustrates how consumption responds to SNAP benefits. In the absence of SNAP, a typical consumer purchases some mix of food and non-food goods, choosing the bundle that maximizes her utility and exhausts her budget constraint. This is represented as point A_0*, with the consumer purchasing food in the amount F_0. After SNAP is introduced, the budget constraint shifts outwards and the consumer chooses the consumption bundle represented by

[16] See also Currie and Gahvari (2008) for an excellent overview of the economics of in-kind transfer programs.

point A_1*. Note that consumption of both goods increases, and food consumption goes up by less than the full SNAP benefit amount. Such a consumer is termed "infra-marginal" and the canonical model predicts that SNAP will increase food spending the same amount as if the SNAP benefits were paid in cash. As discussed further below, the predicted impacts of proposed policy changes, such as calls to restrict purchases of certain goods with SNAP benefits, hinges on what proportion of recipients are infra-marginal.

There are two important exceptions to the SNAP-as-cash model, though. The first is for consumers that prefer relatively little food consumption. In the absence of SNAP, such a consumer may choose the consumption bundle labeled B_0* in Panel B. When SNAP is introduced, this consumer spends only his benefit amount on food, preferring to use all available cash resources to purchase other goods as represented at point B_1*. If benefits were paid in cash instead of as a food voucher, the consumer would opt to purchase less food and could obtain a higher level of utility. As a result, for this type of consumer, the canonical model predicts that SNAP will increase food spending by more than an equivalent cash transfer would. Another exception to the standard model comes from behavioral economics and predicts that SNAP may not be equivalent to cash if households use a mental accounting framework that puts the benefits in a separate "category".[17]

We can extend this approach to consider the effects of the WIC program. There are two important distinctions. First, WIC is a "quantity" voucher not a value voucher. So while SNAP gives you, for example, $100, WIC instead gives you 16 quarts of milk (or dairy). Second, there are specified goods that are provided by the voucher. We present the WIC budget constraint in Figure 3.2 and adapt the SNAP graph and put "targeted subsidized goods" on the x axis and all other goods (which includes much of the food budget) on the y axis. The no program budget constraint again is AB, and here the budget set shifts out by the WIC quantity voucher Q_W. Therefore, importantly, here WIC recipients are price insensitive; their budget constraint (and potential increase in utility due to the program) is affected by the quantity Q_W, regardless of the price of those goods. As with SNAP, there is a region that is attainable with a cash transfer that is not attainable with WIC and we have inframarginal consumers and constrained consumers. However, because WIC is such a specified bundle, we expect that many more consumers will be constrained and at point C.

School lunch and breakfast programs are even more specified. We model these as "take it or leave it" benefits – if you are eligible for a free lunch then you have the choice to consume the lunch or use private resources for lunch. This is illustrated in Figure 3.3 with the targeted subsidized good (e.g. school lunch) on the x axis and all other goods on the y axis. We represent the school lunch option as a single point, and as the quality of the lunch increases the point shifts

[17] There are other reasons that may explain why SNAP leads to different effects on food consumption compared to ordinary case income. It is possible that the family member with control over food stamp benefits may be different from the person that controls earnings and other cash income. If the person with control over food stamps has greater preferences for food, then we may find that food stamps leads to larger increases in food consumption compared to cash income. Alternatively, families may perceive that food stamp benefits are a more permanent source of income compared to earnings. Finally, Shapiro (2005) finds evidence of a "food stamp cycle" whereby daily caloric and nutritional intake declines with weeks since their food stamp payment suggests a significant preference for immediate consumption.

out. Some consumers will chose the private option, others will chose the public option. As the quality of the public option increases, more will switch into the lunch program.

Other than SNAP, the WIC and school feeding programs are explicitly targeted at certain groups (pregnant women, infants, children age 1-4, school aged children). In the context of families, it is possible perhaps likely, that the program could benefit other family members that are not explicit recipients. This could happen with WIC because the goods purchased with the vouchers could be shared with the family. Additionally, the income effect of the program (WIC or school feeding programs) could generate an increase in other foods or other goods that benefit the family more broadly. Perhaps less important, WIC's nutrition education component may lead to changes for the entire family.

INCORPORATE DISCUSSION IN Currie and Ghavari, 2008

3.2 Effects of FNP on food insecurity, diet and health

As discussed above, Food Stamps increases household resources. If health is a normal good, then increases in resources due to Food Stamps should increase health. With this framing, an increase in income could lead to changes in health through many channels. One obvious channel for food stamp impacts is through improvements in nutrition. The increased transfer income could also encourage behaviors that could harm health, such as smoking or drinking.[18] Health improvements may work through other channels as well, for instance reducing stress (e.g., financial stress).

There also may be linkages between access to food stamps in childhood and later life health and human capital outcomes. Causal mechanisms by which early childhood events affect later-life are best understood for nutrition. For example, undernourished children may suffer from anemia and listlessness. This may reduce their ability to invest in learning during childhood and may harm their long-run earnings and other outcomes. Poor early life nutrition may also directly harm long-run outcomes through altering the body's developmental trajectory. There is an emerging scientific consensus that describes critical periods of development during early life that "program" the body's long-term survival outcomes (Barker, 1992; Gluckman and Hanson 2004). During development, the fetus (and post-natally the child) may take cues from the current environment to predict the type of environment it is expected to face in the long run and in some cases adapts its formation to better thrive in the expected environment (Gluckman and Hanson 2004). A problem arises, however, when the predicted later environment and the actual later environment are substantially different. For example, if nutrients are scarce during the pre-natal (or early post-natal) period, the developing body therefore predicts that the future will also be nutritionally deprived. The body may then invoke (difficult-to-reverse) biological mechanisms to adapt to the predicted future environment. For example, the metabolic system may adapt in a manner that will allow the individual to survive in an environment with chronic food shortages. This pattern is termed the "thrifty phenotype" and is sometimes referred to as the Barker hypothesis. The "problem" arises if in fact there is not a long-run food shortage, and nutrition is plentiful. In that case, the early-life metabolic adaptations are a bad match to the actual

[18] Even though recipients cannot purchase cigarettes directly with FSP benefits, the increase in resources to the household may increase cigarette consumption, which would work to reduce birth weight.

environment and will increase the likelihood that the individual develops a metabolic disorder, which can include high blood pressure (hypertension), type II diabetes, obesity and cardiovascular disease. To summarize, a lack of nutrition in early life leads to higher incidence of metabolic syndrome, thus greater access to food and nutrition programs in early life and childhood may reduce metabolic syndrome in adulthood.

3.3 Effects on Labor Supply

We begin by considering the effect of SNAP on labor supply. As discussed above, SNAP benefits have the structure of a traditional income support program, with a guaranteed income benefit that is reduced with family income at the legislated benefit reduction rate. Recipients are allotted a benefit amount *B* equal to the difference between the federally defined maximum benefit level for a given family size (i.e. *G*, the guarantee amount) and the amount that the family is deemed to be able to afford to pay for food on its own according to the benefits formula (essentially 30 percent of cash income, less some deductions). We illustrate the labor-leisure tradeoff with and without food stamps in Figure 3.4. Like other means-tested programs, SNAP alters the household's labor-leisure tradeoff increasing after tax and transfer income at earnings up to the breakeven point. SNAP benefits are largest at zero hours of work, and benefits are reduced as income and earnings are increased leading to an implicit tax rate on earned income. The benefit reduction rate in the food stamp program is 30 percent.

In Figure 3.4, the x axis measures the amount of leisure consumed, and the y axis measures total income including the SNAP benefit.[19] The "no benefit" budget constraint is a straight line with a slope equal to the individual's wage *W*. The individual has a certain amount of unearned income (*U*), and the budget constraint is represented by the line *CAL*. The simple static labor supply model states that an individual maximizes her utility subject to this budget constraint, and assuming a positive labor supply choice, chooses some combination of consumption of goods and leisure at points illustrated for consumers with different preferences by $A^{\sim}$ and $A^{\wedge}$. If her offer wage is below her reservation wage (the slope of the indifference curve at zero hours of work) then it will be optimal to remain out of the labor force, as illustrated by point *A* (at maximum leisure choice *L*, or hours=0).

Adding SNAP alters the budget constraint to line *CA'L* by adding non-labor income *G*, and rotating the slope of the budget constraint to $W(1-t)$ where *t* is the tax rate on benefits as income increases (t=0.3). For the individual supplying zero hours of work and consuming only leisure, consumption opportunities increase by the SNAP "guarantee" amount *G*. At the income eligibility threshold (labeled on the y axis) you earn enough such that benefits have been fully taxed away.

As is well known, this combination of a guaranteed income and benefit reduction rate leads unambiguously to predictions of reductions in the intensive and extensive margins of labor supply. In this case, both the income effect of the benefit as well as the income and substitution effect from the benefit reduction rate leads, unambiguously, to a predicted decline in employment (extensive margin), hours worked (intensive margin), and (if wages are fixed)

[19] By shifting out the budget constraint by the full SNAP benefit we assume households treat the benefit as cash. We also assume, for simplicity, that there are no other welfare programs in place.

earnings. In addition, family *cash* income (which as measured does not include food stamp benefits) would also be predicted to fall. (Of course, family total after transfer income including food stamps is likely to increase.)

Referring back to Figure 3.4, our representative individual who was, prior to the introduction of the food stamp program, in the labor force and consuming at point $A^{\sim}$, is predicted to increase their leisure (reduce their hours worked) choosing a consumption bundle $A^{\sim}$'. Alternatively, it is possible that the combination of the negative income and substitution effects can push them out of labor market to point A'.

Figure 3.5 adapts the labor-leisure diagram to model WIC and the school feeding programs. For these programs a household receives a fixed benefit B for all income levels up to the eligibility limit (e.g., 185% poverty for WIC). Thus the budget set shifts out by a constant amount and creates a "notch" or cliff where the household reaches the eligibility limit. The qualitative predictions for labor supply are the same as for SNAP -- reductions in the intensive and extensive margins of labor supply. In this case, many households face a pure income effect while higher income households face the incentive to reduce their labor supply to obtain eligibility.

4. Review of Results of Research on the Programs

4.1 Challenges for identification and overview of empirical approaches

A central challenge for evaluation of the effects of food and nutrition programs is that commonly used quasi-experimental approaches are not easily applied. First, food and nutrition programs are federal and exhibit little variation across states such as been used in the analysis of AFDC and TANF. Second, the programs have not seen repeated reform or expansions such as has been used in analysis of the Earned Income Tax Credit. Finally, with respect to the food stamp program, the universal nature of the program means there are no ineligible groups to serve as controls, which is another common approach in the quasi-experimental literature.

Early studies use comparisons between participants and non-participants to estimate the effect of food and nutrition programs. Many researchers (Bitler 2013; Currie, 2003; Bitler and Currie, 2005; Ludwig and Miller 2005) have drawn attention to the fact that selection into participation in these programs is non-random. If program recipients are healthier, more motivated, or generally positively selected, then comparisons between the participants and non-participants could produce positive program estimates even if the true effect is zero. Conversely, if program participants are more disadvantaged, or generally negatively selected, then nonrecipients, such comparisons may understate the program's impact.

Bitler (2013) provides a recent analysis to examine the selectivity of SNAP recipients. She examines detailed health data from NHANES and NHIS and shows that SNAP recipients have worse diets and nutritional intake, higher levels of obesity and underweight, worse child health and adult health when compared to all non-recipients or income eligible non-recipients. Thus, it seems clear that SNAP recipients are negatively selected. ADD SOMETHING COMPARABLE FOR WIC.

There are several approaches to solving this fundamental identification problem. First, some studies make use of the limited policy variation across areas. For SNAP, this includes variation due to welfare reform (especially for examining immigrants versus natives), state SNAP policies (length of recertification periods, fingerprinting, vehicle asset exemptions and broad based categorical eligibility). OTHER FNP INSTRUMENTS? In some cases, these state policy rules may not change much from year to year, which limits their suitability as instruments. This approach is used in instrumental variable settings, essentially providing instrument-driven variation in program participation. Policy variation is also used in reduced form approaches.

Second, other studies take an historical approach and use program introduction, relying on variation across areas during the rollout years of the program. As discussed above, both the Food Stamp Program and WIC were introduced at different points across counties in the U.S. This allows for an event study or difference in difference approach to evaluate the programs, essentially using untreated counties as controls for treated counties. The validity of this approach relies on the exogeneity of the timing of the rollout across areas.[20]

[20] This approach has also been used to analyze many other aspects of the Great Society and Civil Rights era (Ludwig and Miller, 2007; Finkelstein and McKnight, 2008; Bailey 2009; Cascio, Gordon, Lewis and Reber 2010; Almond, Chay and Greenstone 2006; Goodman-Bacon 2014).

A third approach is to use longitudinal data and control for family, person, or sibling fixed effects. This approach nets out time invariant effects. For example, in an analysis of siblings, family fixed effects generate estimates by comparing outcomes among siblings who participated in the program compared to outcomes among those who did not. There are drawbacks to this approach. Between-birth changes in economic or health conditions of other family members may be correlated with between sibling differences in program participation. Additionally within-family comparisons are likely to exacerbate measurement-error problems that bias estimates towards zero (Griliches 1979). There also may be spillover effects from the participating sibling to the non-participating sibling, which will lead to underestimates of the program's true effect. In such cases, selection biases will not be eliminated. Another longitudinal differencing approach uses an individual fixed effects estimator, which compares outcomes for those who switch (into or out of) program participation. Of course, there could be some third factor that affects both transitions into (or out of) program participation and outcomes.

Fourth, some studies use regression discontinuity approaches, comparing those in a small band above the eligibility threshold to those in a small band below the eligibility threshold. The validity of the approach requires a sharp change in participation at the discontinuity that is not correlated with other changing variables. This approach can be applied to income eligibility for WIC and school feeding programs where you are either eligible or not eligible for the entire bundle of benefits. This approach would not be generally be appropriate for SNAP because, empirically, participation smoothly falls as income rises (the benefit falls as income rises) It also can be applied to age discontinuities in eligibility for the other food and nutrition programs.

Fifth, randomized experiments could in principle capture the effect of food and nutrition programs (or more likely, changes in program policies). In practice, in the past decades there is not much such evidence. Finally, another approach uses matching methods to control for selection, essentially relying on "selection on observables".

In order to focus our review of the literature on the studies with the most credible evidence, we limit our discussion below to papers that use of the "design based" approaches discussed above. The most common study that would not pass this criterion would be simple comparisons, either with or without regression controls, of FNP recipients and nonrecipients.

4.2 Research on Food Stamp Program

4.2.1 SNAP Participation

As we showed in Table 2.1 and Figure 2.1, participation in and expenditures on SNAP have varied significantly over time. One consistent stand in the literature seeks to understand the determinants of these changes in the program (Table 4.1 provides a catalog of the papers we review.) The literature has explored the role of the macroeconomy, changes in SNAP policies, changes in related program policies (especially welfare reform), and changes in demographics. The papers in this area typically leverage variation across states and over time in labor market

conditions (e.g. unemployment rates, EPOP) and program polices. As outlined above, SNAP is primarily a federal program and has less variation across states than other parts of the U.S. means tested safety net (such as Medicaid or TANF). State varying policies of interest include recertification periods, immigrant eligibility for SNAP following welfare reform, presence or absence of restrictions for ABAWD, and the broad based categorical eligibility expansions of the 2000s.

Overall, the macroeconomy consistently ranks as the largest contributor to changes in SNAP caseloads. However, SNAP and welfare policies have also played a role. Welfare reform and reductions in SNAP certification periods led to reductions in SNAP caseloads in the 1990s (Currie and Grogger 2001, Kabbani and Wilde 2003, Ziliak et al 2003, Figlio et al 2000). Additionally, changes in immigrant access to safety net during the welfare reform period also led to reductions in SNAP participation (Borjas 2004, Haider et all 2004, Kaestner and Kaushal 2005, Bitler and Hoynes 2013).

Ganong and Liebman (2013) examine the large increase in SNAP caseloads in the Great Recession and find that local economic conditions explain about two-thirds of the increase in SNAP with a much smaller role for SNAP policy changes (e.g., expansions for broad based categorical eligibility).[21] Ziliak (2013) finds a larger role for policy, perhaps accounting for 30% of the caseload change. Bitler and Hoynes (2014) find that the countercyclical effect of SNAP (effect of the unemployment rate on SNAP caseload) was larger in the Great Recession compared to the early 1980s recession (although not statistically different).

4.2.2 SNAP and Consumption

The first order prediction is that SNAP, by shifting out the budget set, should lead to an increase in food (and nonfood) spending. This is confirmed in the empirical literature. The model also predicts that for inframarginal households, SNAP should lead to a similar increase in food spending compared to equal sized cash transfer. There was significant attention to this question in the 1980s and 1990s, typically using observational approaches (comparing recipients to nonrecipients) and suffering from the biases due to selection discussed above. Overall, many of these early papers found that SNAP recipients consume more food out of SNAP than they would with an equivalent cash transfer (Currie 2003).

More recent papers, however, based on research designs that are able to isolate causality have found evidence more consistent with the canonical model. As reviewed in Currie, RCTs on "cashout" experiments in the 1990s found little difference in food spending between the group receiving benefits in cash versus in food vouchers. The reanalysis by Schanzenbach (2007) finds that the mean treatment effect is a combination of no difference in food spending among infra-marginal recipients, and a substantial shift in consumption toward food for stamp recipients who are constrained. Overall, these experiments provide evidence on the difference between cash and vouchers, but do not provide estimates for the broader question of how providing SNAP benefits (by increasing family disposable income) affects food spending or consumption more broadly.

[21] When examining the earlier period, especially the Bush expansions in the early 2000s, Ganong and Liebman find more of a role for policy changes in explaining the growth of food stamp caseloads.

Hoynes and Schanzenbach (2009) use the initial rollout of the food stamp program to quasi-experimentally examine the effects on food spending. As discussed above, food stamp introduction took place across the approximately 3,000 U.S. counties between 1961 and 1975. They find that the introduction of FSP leads to a decrease in out-of-pocket food spending and an increase in overall food expenditures. The estimated marginal propensity to consume food out of food stamp income is close to the marginal propensity to consume out of cash income. In addition, those predicted to be constrained (at the kink in the food/nonfood budget set) experience larger increases in food spending with the introduction of food stamps.

Beatty and Tuttle (2012) use a difference-in-difference approach taking advantage of the 13.6 percent increase in SNAP benefits in the 2009 ARRA stimulus. Using non-recipients as controls (with matching methods), they find that the 13.6 percent increase in benefits leads to a 6 percent increase in food at home.

A second set of studies also examine the effects of food stamps on consumption, but there the focus is on the estimating the insurance effects of the program. Blundell and Pistaferri (2003) use longitudinal data from the PSID to examine how SNAP mitigates the effect of shocks to permanent income on income and consumption volatility. Gundersen and Ziliak (2003) use an IV approach to examine how log income changes affect log consumption. Both studies show that SNAP provides important consumption protection. Gundersen and Ziliak find that SNAP receipt reduced income volatility by 12% and food consumption volatility by 14%. Blundell and Pistaferi find that the effect of permanent income shocks decline by about one-third with SNAP.

4.2.3 SNAP and Food Insecurity

Food hardship measures were developed by the USDA in response to the National Nutrition Monitoring and Related Research Act of 1990 with an interest in "access at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2012). The first measures were released in 1995 and currently "food security" (or insecurity) is determined through a battery of questions asked during the December CPS as part of the Food Security Supplement (CPS-FSS). There are 10 questions asked of all households, and an additional 8 questions asked of households with children. [I DON'T THINK WE NEED TO INCLUDE TABLE OF QUESTIONS BUT WE COULD] There are four kinds of questions: those that capture anxiety or perception that the food budget or supply is inadequate in quantity. There are also questions that capture whether food is perceived to be inadequate in quality. A group of questions are more quantitative in nature, asking about instances where food intake was reduced or weight loss occurred associated with reduced food intake. One set of these questions pertains to adults and the other to children in the household. Answering more of these questions affirmatively indicates a more severe degree of food insecurity. For example, "very low food security among children" is equal to 1 if 5 or more of the 8 child-centered food security questions are answered affirmatively (Nord et al. 2009), and zero otherwise.

There are several existing reviews of the literature of SNAP and food insecurity [FI] (e.g., Currie 2003, Gregory, Rabbitt, Ribar 2013). Here we focus on the research since Currie's review that matches our research design criteria.

One set of studies use instrumental variable approaches, typically using state SNAP policies as instruments (Yen et al 2008, Mykerezi and Mills 2010, Shaefer and Gutierrez 2013, Ratcliffe et al 2011). One common instrument is the state's SNAP certification length, is not a very strong instrument but may be good on excludability grounds. A second instrument leverages variation in state policies towards immigrant SNAP coverage or overall immigrant participation in the program. This is more powerful but less likely to be excludable. The results vary across studies, typically finding that SNAP participation leads to decreases in FI (e.g. beneficial) but many are insignificant.

Two studies use IV approaches but broaden the analysis to examine effects of public assistance (rather than only SNAP). Borjas (2004) uses welfare reform and the relatively large reduction in program participation among immigrants in a triple difference IV, essentially using state by year by citizenship status as the instrument. Schmidt, Shore-Sheppard and Watson (2013) use a simulated program benefit (using detailed benefit calculators) as an instrument for actual benefits to identify the effects of benefit income on FI. Both studies find that program participation (or benefits) leads to reductions in FI.

A second approach uses a household fixed effects and longitudinal data, essentially identifying the effects of SNAP on FI using switchers into and out of SNAP (Depolt et al 2009, Wilde and Nord 2005). This approach may not be credible, given that that transitions into SNAP may be correlated with other factors that negatively affect FI. Compared to the IV approach, these studies are more likely to find a positive association between SNAP and FI. A final approach uses propensity score matching (e.g, Gibson-Davis and Foster 2006) often finding a positive association between SNAP and FI.

Overall, the literature on SNAP and FI finds a wide range of results, some finding positive association, some negative and some insignificant. This range is well illustrated in the recent review and replication work in Gregory et al (2013) showing a range of estimates for propensity score matching, longitudinal and IV approaches in one sample. This range of estimates illustrates well the challenge for causal identification in evaluating the effects of food and nutrition programs.

4.2.4 SNAP and Child and Adult Health

The literature on child and adult health takes a similar path to the literature on food insecurity. Studies use family and child fixed effects, instrumental variables, and propensity score matching. In this setting there are also studies that leverage the historical rollout of SNAP. As above, we review the studies since Currie (2003) that matches our research design criteria. The recent review by Meyerhoefer and Yang (2011) is also a useful reference.

Studies of the effect of SNAP on child BMI find varying effects, depending to some degree on the estimation approach. Gibson (2004) uses child and family fixed effects and finds SNAP leads to a reduction in overweight for boys but an increase for girls. Vartanian and Houser (2012) use a similar approach but relate childhood exposure to adult BMI, finding a beneficial effect of SNAP. Schmeiser (2012) uses an IV approach, with state SNAP policies as instruments (recertification period, fingerprinting, vehicle asset exemptions), and finds that SNAP reduces

BMI for most gender-age groups. Kreider et al (2012) address selection into and measurement error of SNAP using a bounding approach and find quite substantial bounds that generally cannot rule out positive or negative effects of SNAP on BMI.

Similar approaches are used to examine effects on adult health. Gibson (2003) uses an individual fixed effects approach and finds SNAP participation increased obesity among women. Fan (2010) extends approach and adds propensity score matching and finds no significant effect of SNAP on obesity, overweight or BMI. Meyerhoefer and Pylypchuk (2008) use individual fixed effects and IV and find SNAP leads to increases in obesity for women and no significant effects for me. Their instruments-state SNAP policies—do not vary over time so these effects could be capturing state cross sectional correlations. Kaushal (2007) extends Borjas's (2004) study and uses welfare reform as the instrument for SNAP; she finds insignificant effects of SNAP on obesity of immigrants.

There is a small set of studies that examine the effect of SNAP on birth outcomes; thereby examining the effects of SNAP on pregnant women. Currie and Moretti (2008) use the county roll out of FSP in California and find that FSP introduction was associated with a *reduction* in birth weight, driven particularly by first births among teens and by changes for Los Angeles County. Almond, Hoynes and Schanzenbach (2011) extend that work and examine the effects of the program rollout across all counties in the U.S. and find infant outcomes improve with FSP introduction. Changes in mean birth weight are small, but impacts were larger at the bottom of the birth weight distribution, reducing the incidence of low birth weight among the treated by 7 percent for whites and between 3 percent for blacks. They also find that the FSP introduction leads to a reduction in neonatal infant mortality, although these results rarely reach statistical significance.

Hoynes et al (2013) use a similar estimation approach to estimate the relationship between childhood access to the Food Stamp Program and adult health and human capital outcomes. They find that access to the FSP in utero and in early childhood leads to a large and statistically significant reduction in the incidence of "metabolic syndrome" (obesity, high blood pressure, heart disease, diabetes) as well as an increase in reporting to be in good health. The results show little additional protection beyond the age of 4, consistent with the importance of early life in the development of metabolic system. They also find for women, but not men, that access to food stamps in early childhood leads to an increase in economic self-sufficiency.

Overall, we have more confidence in the approaches using instruments based on state policies and the quasi-experimental estimates from program rollouts. The estimates relying on within family or within child variation in SNAP participation are subject to the concern that changes in unobservables are simultaneously driving SNAP and health outcomes.

4.2.5 SNAP and Labor Supply

Hoynes and Schanzenbach (2012) use county variation in the rollout of food stamps to identify the impact of food stamps on labor supply. Using the PSID, they use a difference in difference approach (using counties without food stamps as controls) and find no significant impacts on the overall sample but among single-parent households with a female head – a group

much more likely to participate in the program – they find a significant intent-to-treat estimate of a reduction of 183 annual hours (treatment-on-the-treated reduction of 505 annual hours). They find no significant impacts of the FSP on earnings or family income, though the estimates are imprecise.

4.3 Research on WIC

Given the targeted nature of WIC, the literature naturally focuses on the impact of WIC on birth outcomes, breastfeeding, and nutritional intake. (See Table 4.2 for the catalog of the WIC studies we review.) There is also attention on the health of pregnant women and children less than 5. In the earlier volume, Currie (2003) reviews the literature and it generally concludes that women who participate in WIC give birth to healthier infants than non-participants. Here, we update the literature since the Currie review, again limiting to studies that meet our research design criteria.

We begin our review with studies on the determinants of WIC participation. As with the early SNAP literature, the early WIC literature often relied on comparisons of the birth outcomes of women participating in WIC versus not participating. To explore the validity of this approach, several studies explore the characteristics of WIC participants. Bitler and Currie (2005) found that WIC participants (among women with Medicaid funded births) are negatively selected revealed through measures of education, age, marital status, presence of father, smoking, obesity, employment, and housing characteristics.[22] Currie and Rajani (2014) extend this analysis and examine the characteristics of WIC participation among mothers who switched WIC participation status between births. They found that women receive WIC when they are younger, unemployed or unmarried. Identifying these changes are important for evaluating the validity of the maternal fixed effects design. Rossin-Slater (2013), examining variation due to the openings and closings of WIC clinics, finds evidence that participation increases with proximity to a clinic. Two studies examine the cyclicality of WIC participation, finding little relationship between state unemployment and poverty and state WIC caseloads (Bitler et al 2003, Corsetto 2012).

The next panel reviews the literature on pregnancy and birth outcomes. Recent studies have used several different approaches to address the fundamental selection problem. One approach taken is to compare outcomes among more narrowly defined treatment and control groups (e.g., Bitler and Currie 2005, Joyce et al. 2005, 2008, and Figlio et al. 2009). Bitler and Currie (2005) create a control group based on Medicaid funded births and find that WIC leads to higher average birth weight and reduction in small for gestational age. Figlio, Hamersma, and Roth (2009) identify groups marginally eligible versus marginally ineligible for WIC (obtained by matching birth records to older sibling free and reduced price lunch records). They find WIC reduces low birth weight but has no effect on average birth weight, gestational age, or premature birth.

Another approach employs maternal fixed effects models, controlling for unobserved

[22] Women eligible for Medicaid are categorically eligible for WIC. Limiting to Medicaid funded births identifies a sample where all women are eligible for WIC.

family background characteristics by comparing outcomes among siblings who participated in WIC to outcomes among those who did not. Currie and Rajani (2014) use a maternal fixed effects model applied to administrative data from NYC from 1994-2004 and find that WIC leads to reductions in low birth weight and being small for gestational age (but use more medical care).

Joyce et al (2008) discuss the possibility of a *gestational age bias* in this literature. They point out that women whose pregnancies last longer have more opportunity to enroll in WIC. If this is true (which they demonstrate using administrative data) then this leads to a mechanical relationship between WIC participation and longer gestation, biasing the results toward a positive effect of WIC. Currie and Rajani (2014) address this concern by estimating results on the subsample of full term births; they find smaller effects but still conclude that WIC improves birth outcomes.

An alternative approach is to use the introduction of WIC in the 1970s. Hoynes, Page and Stevens (2011) use differences in the timing of roll out by county to examine impacts of WIC on infant health. Using a difference-in-differences analysis, where the control counties have not yet adopted WIC, they find that roll out of the WIC program led to an increase birth weight and a decline in low birth weight. Rossin-Slater (2013) extends this analysis by combining geographic access with a maternal fixed effects approach. In particular, she uses administrative data from Texas combined the detailed information about the opening and closing of WIC clinics over 2005-2009; her approach is identified across mothers who had varying access to WIC clinics across births. She finds WIC improves pregnancy weight gain, birth weight, and breastfeeding initiation.

There are few studies that leverage variation in WIC policy changes. This is in large part due to the minimal variation across states and over time in the program rules. Bitler and Currie (2005) find lower takeup for states with proof of income is required (prior to federal mandate) and higher takeup for states with higher WIC package price. However, they find these to be relatively weak instruments. With the more recent changes to WIC, it might be reasonable to reexamine the potential for using state policy variation to identify the effects of WIC.

The studies above are all focused on pregnant women and outcomes at birth. Yet pregnant women account for less than a quarter of WIC participants (Table 2.X), half are children 1-4 and another quarter infants. There are many outcomes of interest here, notably rates of breastfeeding, nutritional intake, food security, child weight gain, and general health. However, there is a dearth of studies that use credible designs to evaluate WIC on children. Reflecting on the designs used in the analysis of birth outcomes (e.g., maternal fixed effects, geographic and time variation in presence of WIC clinics) it appears possible that to apply them to examine child health. However, this would likely require rich administrative data, combining child health records, linked across siblings, and family WIC participation. The birth records, with fine geographic identifiers, and WIC participation, with the ability to link births across mothers, provide this information. But it is much less common to have these linkages for child health data. Any analysis of the effects of WIC on child health would have to grapple with the interesting question as to the possibility of spillovers to other non-covered family members. This could occur either though the sharing of WIC bundle or an income effect of WIC benefit. It could also possibly work through the nutritional education component of the program.

The supply side of the WIC market is less developed in the literature. There is a small literature on the infant formula market that starts with the stunning fact that over half of all U.S. infant formula is purchased through the WIC program (Oliveira, Frazao, and Smallwood 2010). Further, because WIC is a "quantity-voucher" benefit, recipients are not sensitive to price. This creates clear incentives for producers to price above marginal cost, especially in this highly concentrated market. Amid concerns about the rising costs of formula, the WIC program moved to a system whereby manufacturers bid on the contract to be the formula provider for the state. In exchange for the right, manufacturers pay a rebate on the formula; in practice the rebates are large averaging 85-90% of wholesale price. Recent studies find that market shares increase substantially when landing the state contract (Huang and Perloff 2007, Oliveira, Franzao and Smallwood 2011) but their data does not distinguish between WIC and non-WIC customers. EXPLORE WHAT WE KNOW ABOUT HOW THIS AFFECTS WIC AND NON-WIC CUSTOMERS AND MARKET PRICES [start with Davis 2012]

Another aspect to the supply side has to do with the nature of foods available in stores where WIC recipients are shopping. Andreyava (2012) provide some interesting case study analysis of how WIC authorized grocery and convenience stores stock changes with the recent change in the WIC packages. They found substantial increases in stocking of healthy foods; for example 8% of WIC-authorized convenience and grocery stores had any whole wheat/whole grain bread at baseline; 81% did so after the revisions took effect (while non-WIC stores increased whole wheat/grain bread from 25% to 35%).

4.4 Research on NSLP

Most research on the National School Lunch Program has focused on how the program impacts dietary intake, and also obesity rates. Because the NSLP is virtually universally available, and most policy changes are implemented at the Federal level, there are relatively few examples of credible quasi-experiments in the literature. Most of the research employs differences-in-differences between siblings, or across periods when the NSLP is or is not available.

Gleason and Suitor (2003) compare observations of dietary intake for an individual across multiple days that vary by whether the student does or does not receive a school lunch, and find mixed evidence on nutrition intake. NSLP increases the consumption of fat, protein, and six types of vitamins and minerals, and has no overall impact on total calories eaten at lunch or over a 24-hour period. Nord and Romig (2006) compare intake during the summer vs. the school year for families with school-age vs. preschool-age children, and find that NSLP availability significantly reduces the rate of food insecurity.

Several papers have investigated the relationship between NSLP participation and childhood obesity. The results are somewhat mixed, and results are estimated at different ages and different parts of the income distribution. Schanzenbach (2009) finds that children ineligible for a lunch subsidy who do vs. do not go on to consume school lunch enter kindergarten with similar body weights, but that NSLP participants become heavier as their exposure to school lunch increases. In addition, she uses the income cutoff for receipt of reduced-price lunch and finds that both NSLP participation and body weight discretely increase at the cutoff. Millimet, Tchernis, and Husain (2010) find similar results using the same data. On the other hand,

Gundersen, Kreider and Pepper (2012) use a Manski-style partial identification approach and find that receipt of free or reduced-price lunch improves child health and substantially reduces obesity rates. Mirtcheva and Powell (2013) use children who change their participation in NSLP between waves in the PSID, and find that NSLP has no effect on body weight in either direction.

Dunifon and Kowaleski-Jones (2003) compare siblings who differ in their NSLP participation decisions. In the OLS, NSLP participation predicts and behavioral problems, increased health limitations, and lower math test scores. When sibling comparisons are employed, the coefficients decline in magnitude and are no longer statistically significant, suggesting the OLS correlations in part reflect unobserved family characteristics.

In the spirit of the program rollout literature described in the SNAP section above, Hinrichs (2010) leverages changes in NSLP funding formulas during the early years of the program to estimate the long-run impacts of the expansion of the program. He finds that increasing NSLP exposure in a state by 10 percentage points increases completed education by nearly 1 year for males, and one-third of a year for females. On the other hand, NSLP did not appear to have long-term health impacts.

4.5 Research on SBP

As shown in Table 2.1, participation in the SBP has increased dramatically over the past 20 years. In particular, many more schools have adopted the program during this time period. Bhattacharya, Currie and Haider (2006) use variation in school participation in the SBP prior to the recent increase in participation to identify the impacts of the program on children and their families. Using a difference-in-differences setup, they compare students observed during the school year vs. when they are on school vacation, by whether or not their school offered the SBP. They find that SBP does not impact the number of calories consumed nor the likelihood that a student eats breakfast, but it does improve dietary quality as measured by the Healthy Eating Index and in blood serum. The income transfer implied by the SBP does not appear to spill over and improve dietary quality for other household members, however. Modeling school selection into the SBP and bounding the potential for individual-level unobservables to confound the effect, Millimet, Tchernis and Husain (2010) find that the SBP reduces childhood obesity.

Some states have statutes requiring participation in the SBP for schools that meet at least some threshold (which varies across states, typically between 10 and 40 percent) of eligibility for free or reduced-price meals. Frisvold (2012) uses these thresholds to construct difference-in-differences and RD estimates of the impact of SBP for schools near the thresholds. He finds that SBP improves achievement in math and reading, and that participation improves the nutritional content of breakfast.

Evidence on the SBP has increased recently as researchers have used policy changes aimed at expanding the program to identify its impacts. In particular, to address (perceived) stigma associated with participation in the school breakfast program and in response to incentives from the USDA, some districts have begun (or stopped) offering universal free school breakfast instead of the standard program that provides free breakfast only to students who are income-eligible for a subsidy. There is substantial evidence that universal free breakfast (UFB) has increased participation rates. Leos-Urbel, Schwartz, Weinstein and Corcoran (2013) find that expansion of the UFB program in New York City schools increased participation rates for those previously ineligible for breakfast subsidies, and also for free-breakfast students. This suggests that the UFB program may also reduce stigma associated with participation. They find small

positive impacts of the program on attendance rates, but no impact on test scores. Ribar and Haldeman (2013) use the termination of UFB in some schools but not others in a North Carolina district, and find a decline in participation that was largest for students who were not income-eligible for free breakfasts.

The USDA sponsored a large randomized-controlled trial of UFB, and collected information on impacts on participation, dietary intake, health, behavior and achievement. Crepinsek et al. (2006) analyze the experimental data and find that students who attend a school randomly assigned to receive UFB are more likely to consume a nutritionally substantive breakfast, the program has no impact on 24-hour dietary intakes or on the rate of breakfast skipping.

While UFB increases take-up rates, the limitation remains that in order to participate in the breakfast program a student generally has to arrive at school prior to the start of classes. To remove this barrier, another recent policy innovation has been to serve breakfast in the classroom (BIC) during the first few minutes of the school day. BIC eliminates the need for students to arrive to school early to participate in the school breakfast program, and dramatically increases participation in the SBP. This program has recently gained momentum, with major expansions in cities such as Washington, D.C., Houston, New York City, Chicago, San Diego and Memphis, and a flurry of research studies on the impacts of the program.

Imberman and Kugler (2014) investigate the very short-term impacts of the introduction of a BIC program in a large urban school district in the southwestern United States. The program was introduced on a rolling basis across schools, and the earliest-adopting schools had the program in place for up to 9 weeks before the state's annual standardized test was administered. They find increases in reading and math test scores on the order of 0.06 and 0.09 standard deviations, respectively, but no impact on grades or attendance. Additionally, there was no difference in impact on test scores between those schools that had adopted the program for only one week vs. those that had the program for a longer time. The pattern in the results led the authors to speculate that the test score impacts were driven by short-term cognitive gains on the day of the test due to eating breakfast and not underlying learning gains.

Schanzenbach and Zaki (2014) re-analyze the USDA's experimental data described above to separately investigate the impact of the BIC program. They find few positive impacts on measures of dietary quality, and no positive impacts on behavior, health or achievement measured after 1 to 3 years of treatment. They find some evidence of health and behavior improvements among specific subpopulations. Dotter (2012), on the other hand, finds stronger impacts of the staggered introduction of a BIC program in elementary schools in San Diego. Using a difference-in-differences approach based on the introduction of the program, he finds that BIC increases test scores in math and reading by 0.15 and 0.10 standard deviations, respectively. He finds no test score impacts on schools that previously had universal free breakfast, and no impacts on attendance rates.

4.6 New Developments and Current Policy Discussions

THIS SECTION WILL BE FILLED OUT IN THE NEXT DRAFT. The idea is to discuss current policy issues and discuss studies that are relevant for these discussions.

- The importance of the "food stamp cycle." Shapiro (Journal of Public Economics 2005) uses information on date of food stamp check receipt and relates days in "food stamp

cycle" to information on food calories, nutritional intake, food expenses. Finds decline in all of these with days since food stamp check. Hastings and Washington (AEJ Policy 2010) find something similar with scanner data. Policy prescription – spread SNAP across month (easy with EBT system)

- Dominant policy issue today with SNAP is how to improve the nutrient intake of recipients. One approach is to restrict specific categories of foods deemed as "unhealthy foods" or "junk foods". This moves SNAP away from a universal food voucher and towards more targeted vouchers (e.g. WIC). A second approach is to incentivize the purchase of healthy foods (e.g. subsidy for fruits and vegetables). We will discuss the economic predictions, tradeoffs, and what we know about the effects of such policies.
    - New York City requested a waiver from USDA to ban SNAP recipients from using voucher to purchase a wide range of sugar sweetened beverages. It was rejected.
    - Massachusetts was granted the authority to run a pilot -- the Healthy Incentives Pilot – which was authorized by the 2008 Farm Bill. This led to a small scale RCT where the treatment group received an additional $0.30 for each dollar of SNAP benefits spent on fruits and vegetables (subject to a maximum subsidy). The evaluation shows that this led to a 25% increase in fruits and vegetables consumption.
    - Schanzenbach Hamilton Project proposal

- Using nudges to encourage more healthy choices.
    - USDA is interested; recently funded a *Center for Behavioral Economics and Healthy Food Choice Research*
    - UK nudge experiment *Healthy Start Scheme* with (Griffith et al "Getting a healthy start")

- Importance of who gets the benefit and who shops? Lessons from intra-household studies?

- Is the program too generous? Have the rules been relaxed too much? What about the cumulative work disincentives?

- Increase in participation over the GR (SNAP)

- What about the issues raised in IOM 2013 report on benefit adequacy?

- Additional school nutrition changes (especially competitive foods and vending machines, also gaming of menus to respond to accountability pressures)

5. Summary and Conclusions

TO BE ADDED.

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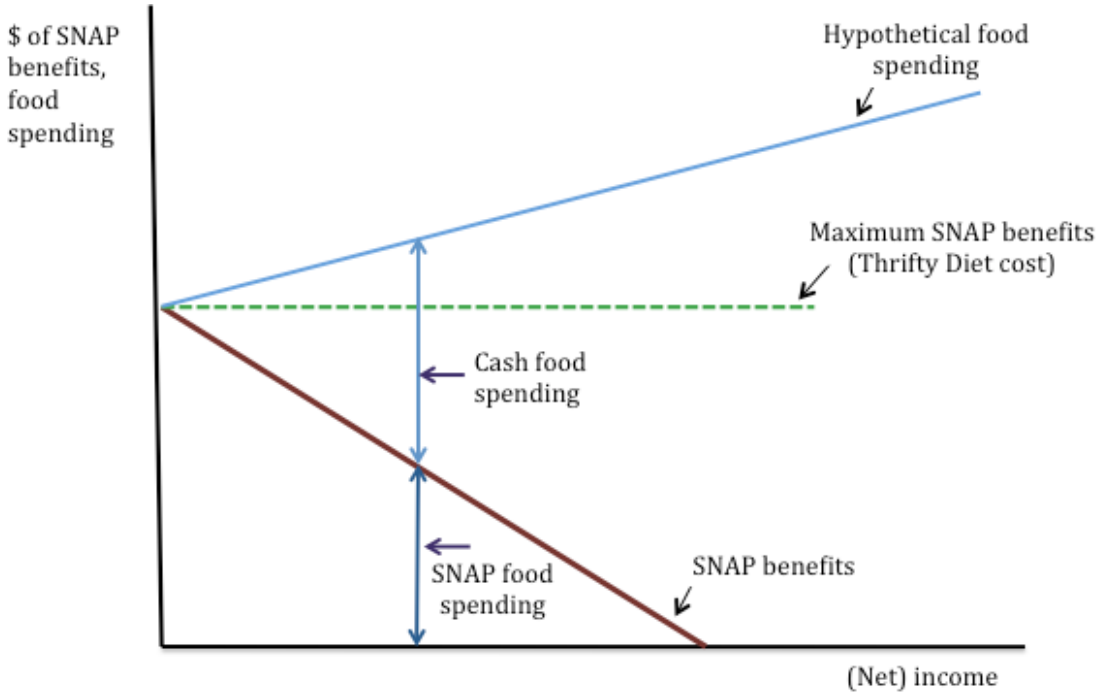
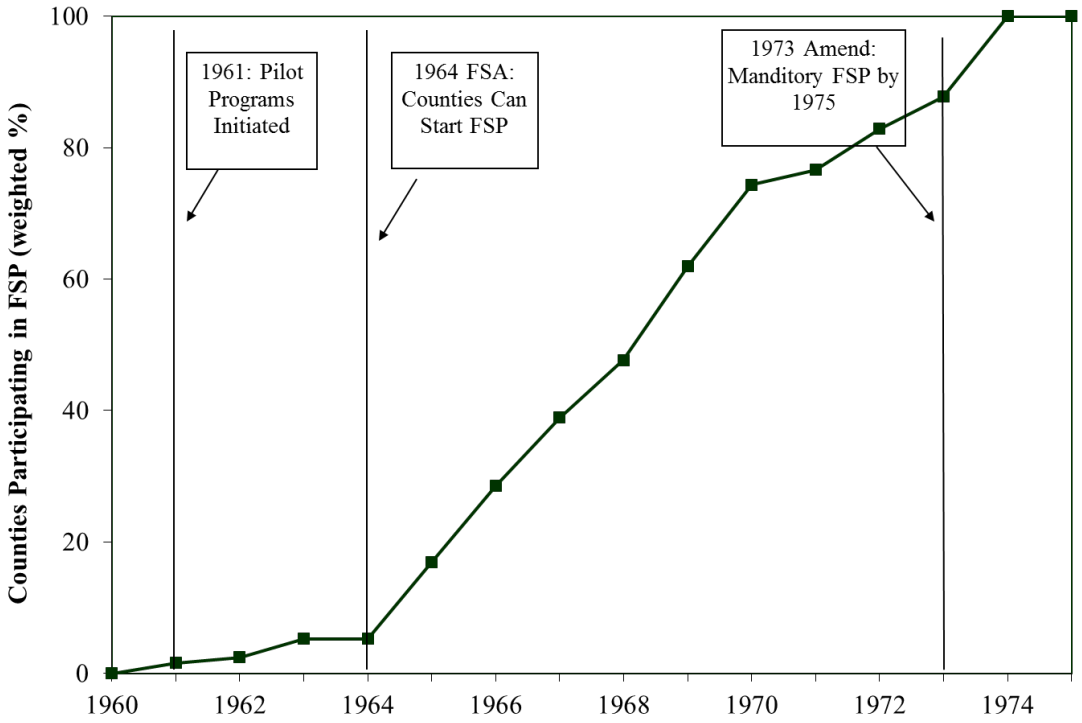
Figure 1.1 Stylized Representation of SNAP Benefit Formula



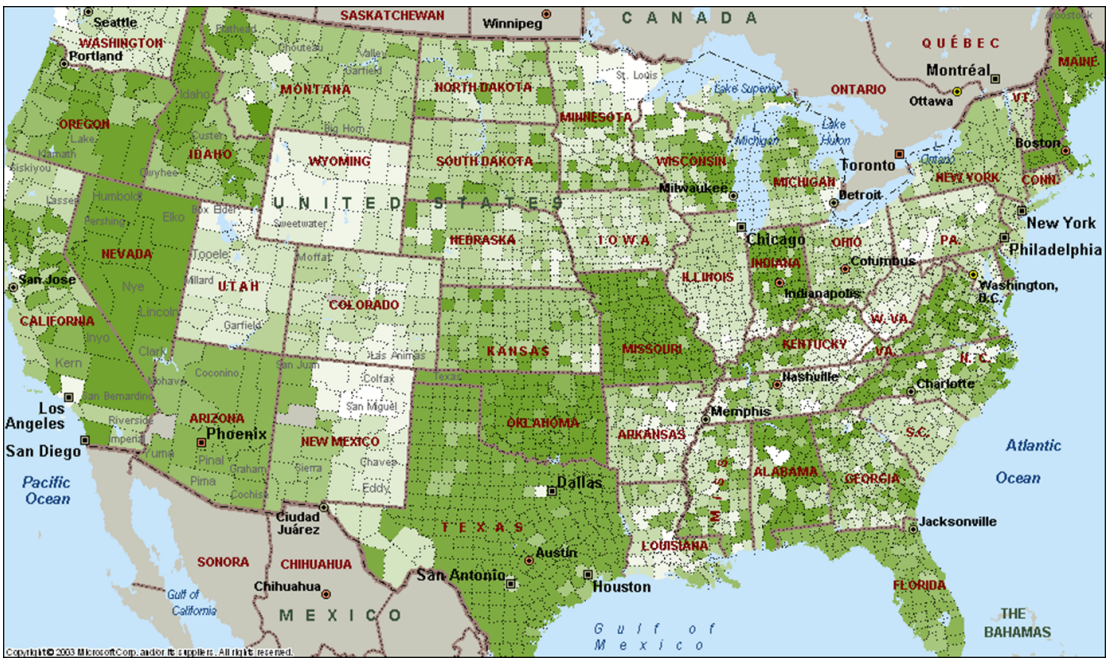
Source: Hoynes, McGranahan and Schanzenbach (2013)

Figure 1.2: Cumulative Percent of Counties with Food Stamp Program, 1960-1975



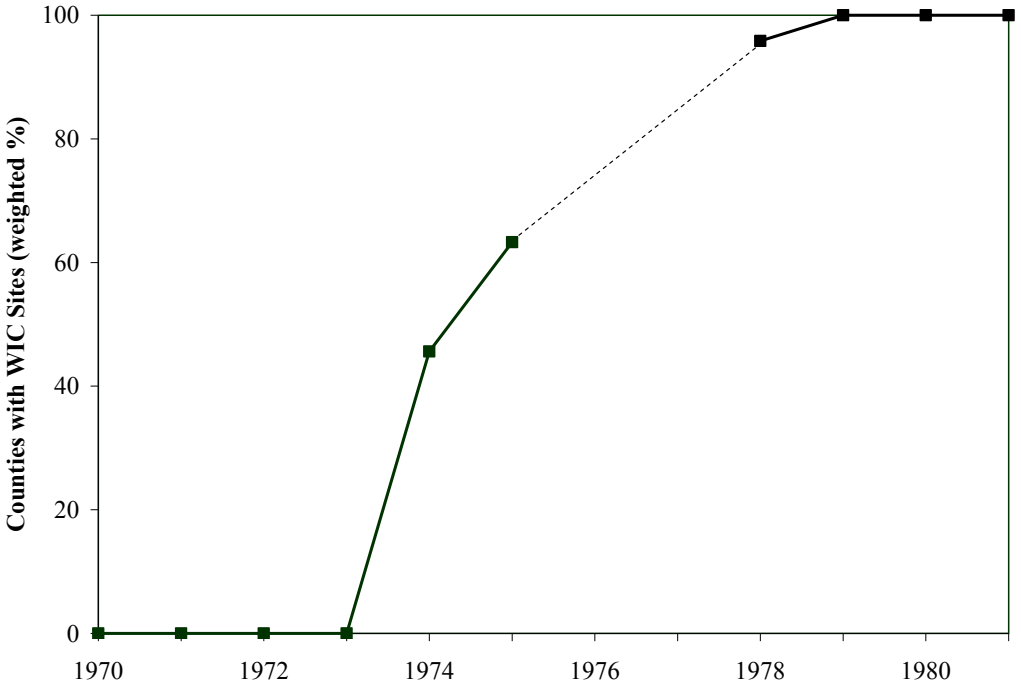
Source: Hoynes and Schanzenbach 2009. Weighted by county population.

Figure 1.3 Food Stamp Start Date, by County



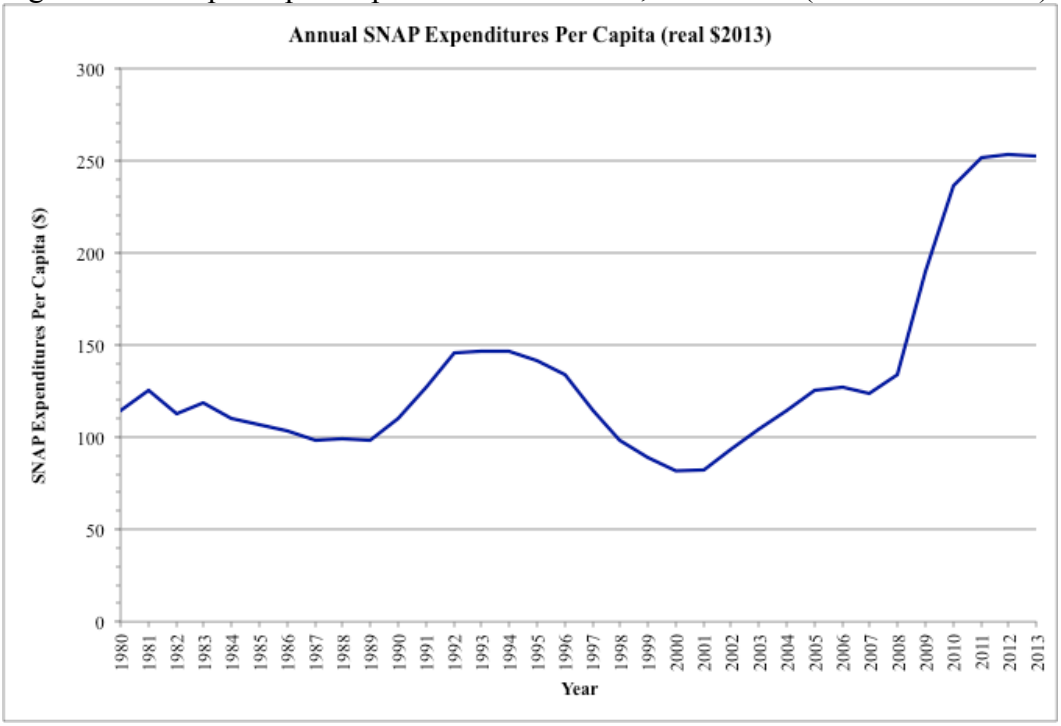
Source: Hoynes and Schanzenbach 2009.

Figure 1.4 Cumulative Percent of Counties with WIC Programs, 1970-1981



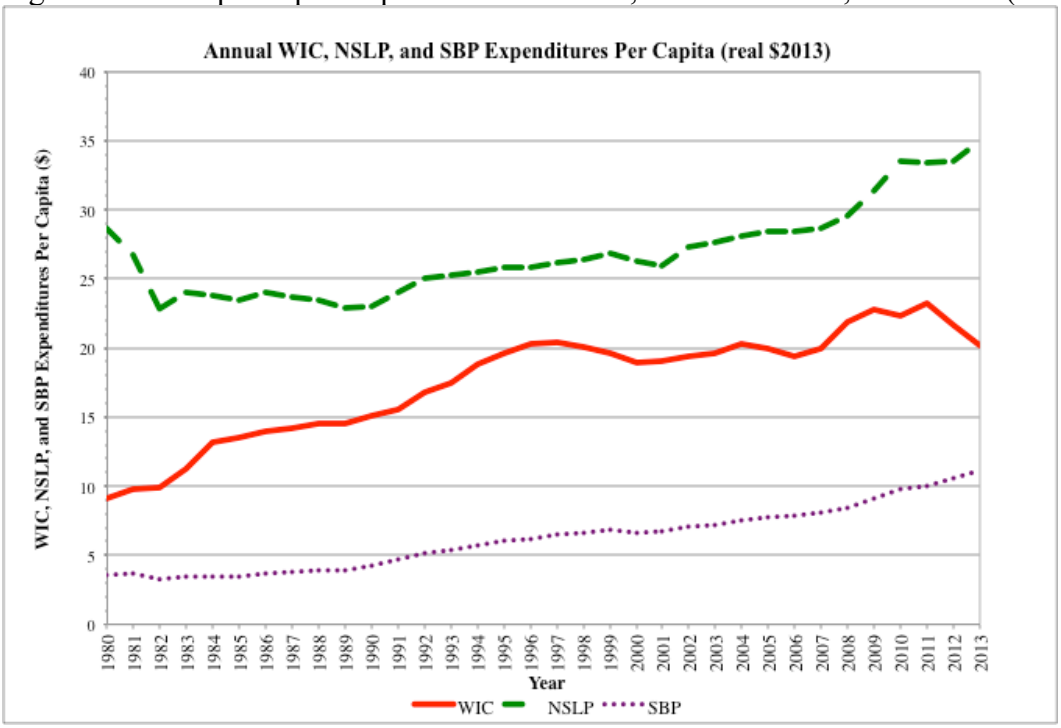
Source: Hoynes, Page and Stevens (2011). Weighted by county population.

Figure 2.1 Real per capita expenditures for SNAP, 1980-2013 (Real 2013 dollars)



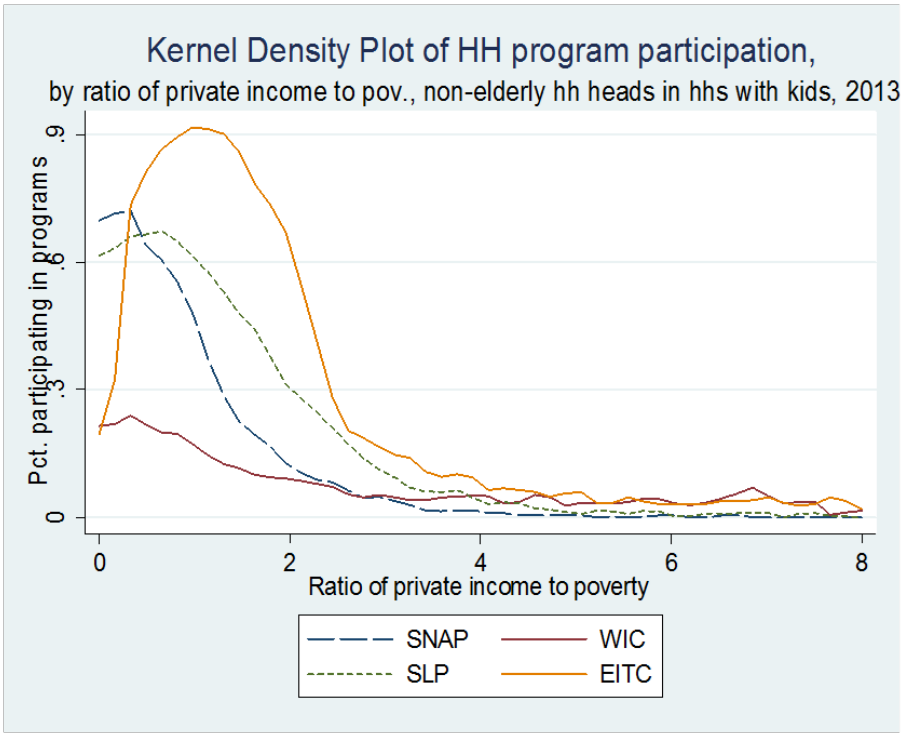
Source: USDA SNAP Program Data, http://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap. For definitions of recessionary periods see Bitler and Hoynes 2014.

Figure 2.2: Real per capita expenditures for WIC, NSLP and SBP, 1980-2013 (real 2013 dollars)



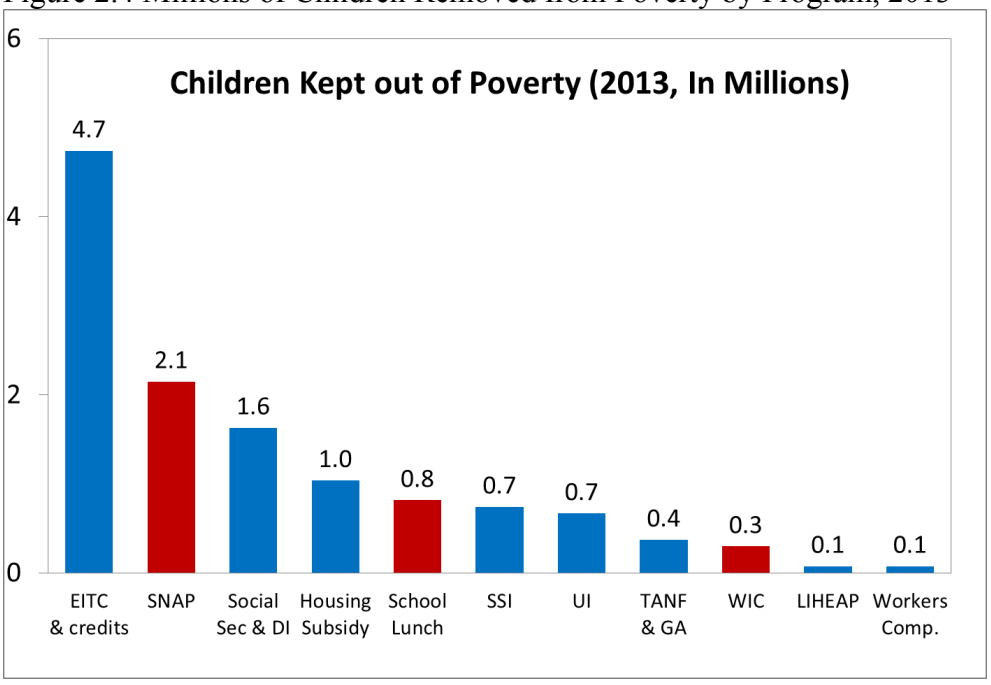
Source: USDA WIC, NSLP, and SBP Program Data, http://www.fns.usda.gov/pd/wic-program; http://www.fns.usda.gov/pd/child-nutrition-tables

Figure 2.3: Household Participation in Food and Nutrition Programs by Household Income to Poverty, Households with Children headed by Nonelderly Individual (2013)



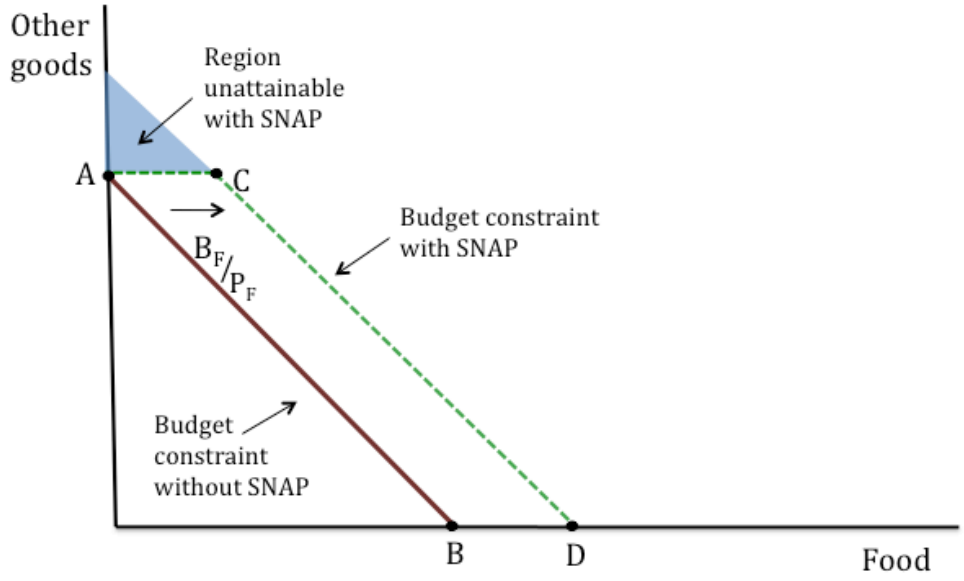
Source: Author's tabulations of 2014 Current Population Survey capturing data for 2013 calendar year. For details on data and definitions see Bitler and Hoynes 2014.

Figure 2.4 Millions of Children Removed from Poverty by Program, 2013



Source: Authors' tabulation of Short (2014).

Figure 3.1 Effects of SNAP on consumption
Panel A: Budget Set Shift



Panel B: Consumer's Utility Maximization Response to SNAP

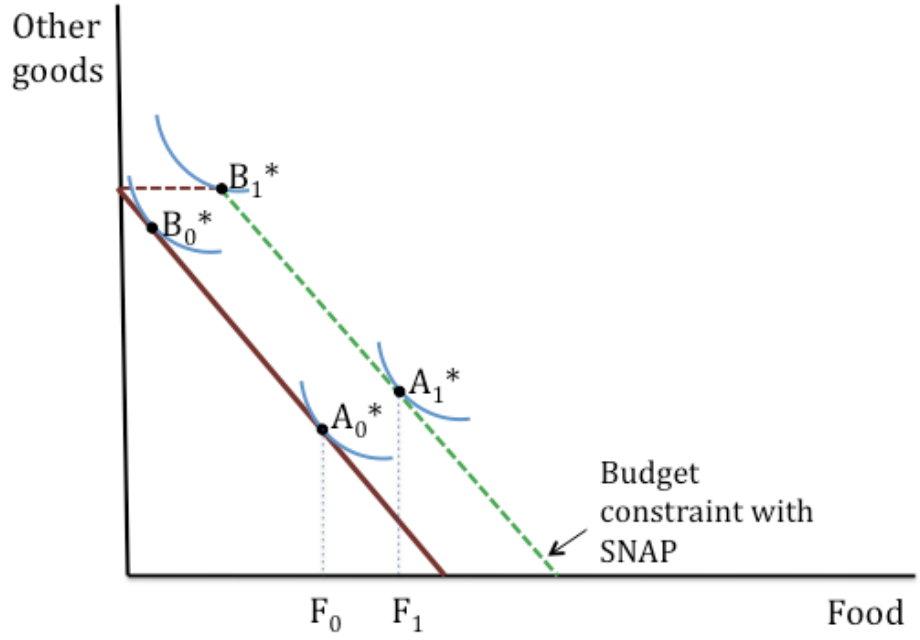


Figure 3.2 Effects of WIC on consumption

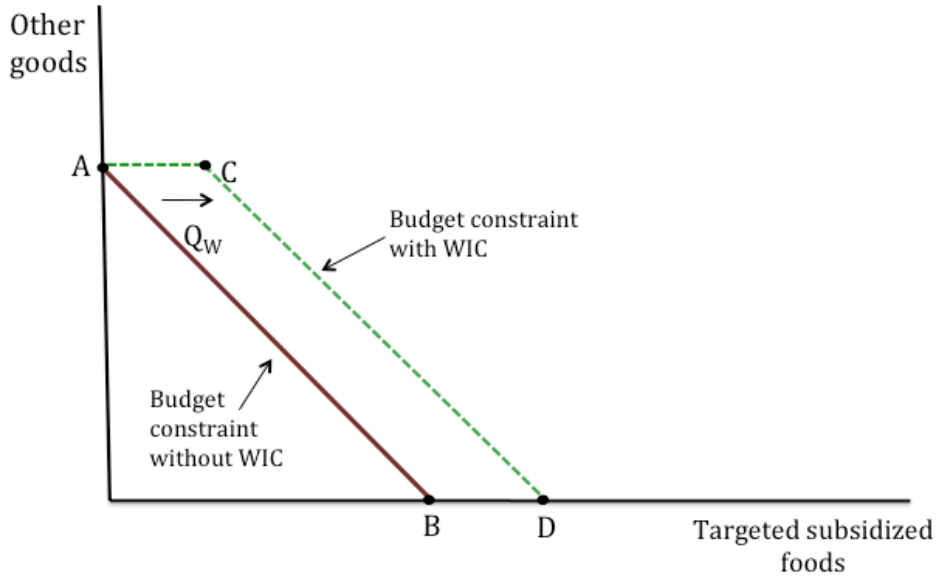


Figure 3.3 Effects of NSLP on consumption

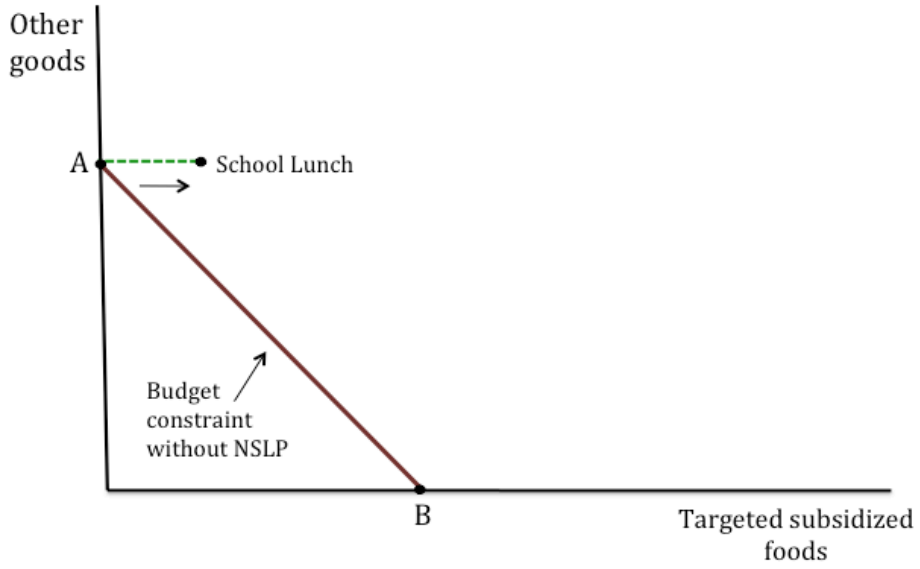
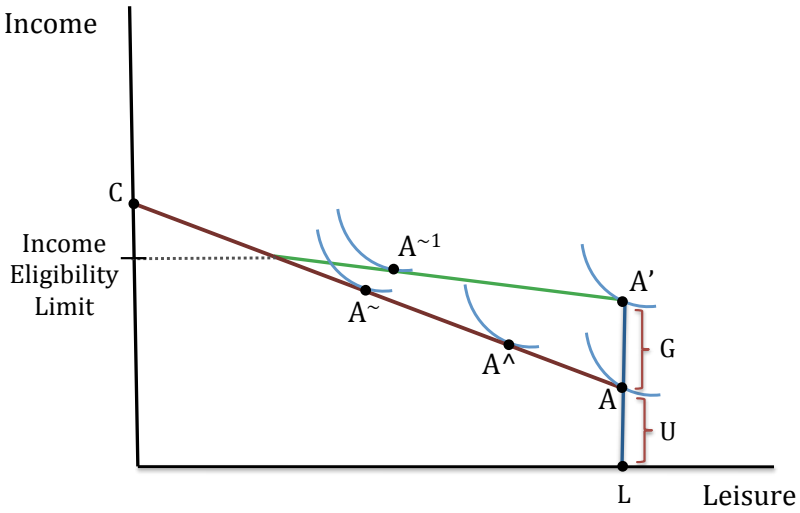


Figure 3.4: Income-Leisure Tradeoffs and Food Stamps



Source: Hoynes and Schanzenbach 2012.

Figure 3.5: Income-Leisure Tradeoffs and WIC / NSLP

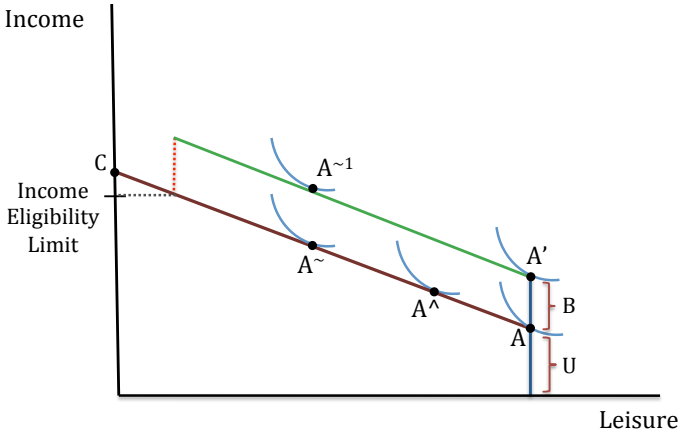


Table 1.1 **Overview of U.S Food and Nutrition Programs and Rules**

Program and Data of Introduction	Federal Cost (2013)	Population Served	Benefits	Eligibility Requirements
Supplmental **N**utrition **A**ssistance **P**rogram (SNAP) *formerly FSP*	79.9 billion	Low-income households	Monthly benefit issued electronically via Electronic Benefit Transfer (EBT) card account and calculated based on Thrifty Food Plan	Household gross monthly income < 130% of poverty
1961: pilot 1975: permenant program		47.6 million individuals/month (2013)	Maximum monthly allotment through 2015: $194 for 1 person household, $511 for 3 person household, and $925 for 6 person household; 2013 average monthly benefit per person = $133.07, per household = $274.98	Meet countable resource limit of $2,250 or $3,250 for elderly or disabled; TANF, SSI, and GA recipients eligible; legal, qualified aliens may be SNAP eligible; some households may be required to meet employment, service, and training requirements; individuals without a Social Security number, most postsecondary students, and strikers are not eligible
Special Supplemental Nutrition Program for **W**omen, **I**nfants, and **C**hildren (WIC)	6.5 billion	Low-income pregnant or postpartum women, infants (<1), and children (<5)	Food instrument or cash-value voucher (some states on EBT) to purchase specified nutrtious foods rich in protein, iron, calcium, vitamins A, C, and D; nutrition education; screening and referrals to health and other social services	Pregnant, postpartum, or breastfeeding women, infants, or children < 5; must be individually determined to be at "nutritional risk" by a health professional; meet State residency requirement; gross income ≤ 185% of FPL
1972: pilot 1974: permanent program		8.66 million individuals (2013)	Food package assignment varies by situational need	WIC eligbility priority system

(continued)

Table 1.1 *(continued)*

Program and Data of Introduction	Federal Cost (2013)	Population Served	Benefits	Eligibility Requirements
National **S**chool **L**unch **P**rogram (NSLP)	11.1 billion	Low-income children	Nutritionally balanced daily lunches conforming to the latest *Dietary Guidelines for Americans* standards; 1/2 daily nutrition requirements	Free lunch if income ≤ 130% poverty; reduced-price lunch if income ≤ 185% poerty
1946		18.9 million children receiving free lunch; 2.6 million receiving reduced price lunch (2013)	Avg. reimbursement rate = $3.06/ free meal, $2.66/reduced price meal, in schools where 60% or more of meals are subsidized and meeting Healthy, Hunger-free Kids Act requirements (SY14/15)	SNAP recipients automatically qualify for free meals
School **B**reakfast **P**rogram (SBP)	3.5 billion	10.2 million children receiving free breakfast; 1.0 million children receiving reduced price breakfast (2013)	Nutrtionally balanced daily breakfast meeting latest *Dietary Guidelines for Americans* standards	Free lunch if income ≤ 130% poverty; reduced-price lunch if income ≤ 185% poerty
1966: pilot 1975: permanent program			Avg. reimbursement rate = $1.93/free meal, $1.63/reduced price meal, at school in severe need (SY14/15)	SNAP recipients automatically qualify for free meals

Source: SNAP eligibility requirements from http://www.fns.usda.gov/snap/eligibility; NSLP and SBP reimbursement rates from http://www.fns.usda.gov/sites/default/files/cn/NAPs14-15.pdf; program statistics from http://www.fns.usda.gov/data-and-statistics; WIC eligibility requirements from http://www.fns.usda.gov/wic/wic-eligibility-requirements; WIC benefits from http://www.fns.usda.gov/wic/wic-eligibility-requirements; SNAP benefits from http://www.fns.usda.gov/node/9320; School meal eligibility guidelines from http://www.fns.usda.gov/school-meals/income-eligibility-guidelines

Table 1.2 WIC Food Packages - Maxium Monthly Allowances

Food Package	Recipient	Food
I	Infants, fully formula fed (0-5 months)	WIC forumula: 823 fl oz reconstituted liquid concentrate (0-3 months) WIC formula: 896 fl oz reconstituted liquid concentrate (4-5 months)
	Infants, partially breastfed (0-5 months)	WIC formula: 104 fl oz reconstituted powder (0-1 month) WIC formula: 388 fl oz reconstituted liquid concentrate (1-3 months) WIC formula: 460 fl oz reconstituted liquid concentrate (4-5 months)
II	Infants, fully formula fed (6-11 months)	WIC formula: 630 fl oz reconstituted liquid concentrate Infant cereal: 24 oz Baby food fruits & vegetables: 128 oz
	Infants, partially breastfed (6-11 months)	WIC formula: 315 fl oz reconstituted liquid concentrate Infant cereal: 24 oz Baby food fruits & vegetables: 128 oz
	Infants, fully breastfed (6-11 months)	Infant cereal: 24 oz Baby food fruits & vegetables: 256 oz Baby food meat: 77.5 oz
III	Infants, fully formula fed (0-11 months)	WIC forumula: 823 fl oz reconstituted liquid concentrate (0-3 months) WIC formula: 896 fl oz reconstituted liquid concentrate (4-5 months) WIC formula: 630 fl oz reconstituted liquid concentrate (6-11 months) Infant cereal: 24 oz (6-11 months) Baby food fruits & vegetables: 128 oz (6-11 months)
	Infants, partially breastfed (0-11 months)	WIC formula: 104 fl oz reconstituted powder (0-1 month) WIC formula: 388 fl oz reconstituted liquid concentrate (1-3 months) WIC formula: 460 fl oz reconstituted liquid concentrate (4-5 months) WIC formula: 315 fl oz reconstituted liquid concentrate (6-11 months) Infant cereal: 24 oz (6-11 months) Baby food fruits & vegetables: 128 oz (6-11 months)

(continued)

Table 1.2 *(continued)*

Food Package	Recipient	Food
IV	Children: 1 - 4 years old	Juice, single strength: 128 fl oz Milk: 16 qt* Breakfast cereal: 36 oz Eggs: 1 dozen Fruits & vegetables: $8.00 in cash value voucher Whole wheat bread: 2 lb** Legumes, 1 lb dry or 64 oz canned OR peanut butter, 18 oz
V	Pregnant and partially breastfeeding women (up to 1 year postpartum)	Juice, single strength: 144 fl oz Milk: 22 qt* Breakfast cereal: 36 oz Eggs: 1 dozen Fruits & vegetables: $10.00 in cash calue voucher Whole wheat bread: 1 lb** Legumes, 1 lb dry or 64 oz canned AND peanut butter, 18 oz
VI	Postpartum women (not breastfeeding, up to 6 months postpartum)	Juice, single strength: 96 fl oz Milk: 16 qt* Breakfast cereal: 36 oz Eggs: 1 dozen Fruits & vegetables: $10.00 in cash calue voucher Legumes, 1 lb dry or 64 oz canned OR peanut butter, 18 oz
VII	Fully breastfeeding women (up to 1 year post-partum)	Juice, single strength: 144 fl oz Milk: 24 qt* Breakfast cereal: 36 oz Cheese: 1 lb Eggs: 2 dozen Fruits & vegetables: $10.00 in cash calue voucher Whole wheat bread: 1 lb** Fish, canned: 30 oz*** Legumes, 1 lb dry or 64 oz canned AND peanut butter, 18 oz

* Allowable options for milk alternatives are cheese, soy beverage, tofu, and yogurt (partially) . No whole milk for > 2 years

** Allowable options for whole wheat bread are whole grain bread, brown rice, bulgur, oatmeal, whole-grain barley, soft corn, or whole wheat tortillas

*** Allowable options for canned fish are light tuna, salmon, sardines, mackerel, and Jack mackerel

Source: USDA Federal Register/ Vol. 79, No. 42/March 2014/ Rules and Regulations accessed http://www.fns.usda.gov/sites/default/files/03-04-14_WIC-Food-Packages-Final-Rule.pdf

Table 1.3 NSLP and SBP History

1946	National School Lunch Act Congress passes to make school lunch program permanent
	A. Serve lunches meeting the minimum nutritional requirements prescribed by Secretary of Agriculture
	B. Serve meals without cost or at reduced cost to children of need
	C. Operate program on a non-profit basis
	D. Utilize commodities declared by the Secretary to be in abundance
	E. Utilize commodities donated by the Secretary
	F. Maintain proper records of all receipts and expenditures to be reported to State agency
1952	1st Amendment to change appropriations in AK, HI, P.R, V.I., and Guam
1962	Amended fund to be apportioned on basis of participation rate and assistance need rate
1966	Child Nutrition Act
	A. Program expanded and strengthened
	B. Special Milk Program added
	C. School Breakfast Program 2-year pilot begins
1971	Congress specifies SBP to target schools in which there are children of working mothers and from low-income families
1973	SBP restructured reimbursement from grant to a specific per-meal reimbursement
1975	SBP becomes permanent with empahsis on schools in severe need
1998	Child Nutrition Reauthorization Act increases federal subsidies for child nutrition programs
2004	Child Nutrition and WIC Reauthorization Act of 2004
	A. Required all school districts receiving federal funds for meal programs to create wellness policies
2010	Healthy and Hunger-free Kids Act
	A. Improves nutrition with a focus on childhood obesity reduction
	B. Increases Access
	C. Increases Program Monitoring
	D. Increases funding

Source: NSLP history from http://www.fns.usda.gov/sites/default/files/NSLP-Program%20History.pdf; SBP history from http://www.fns.usda.gov/sbp/program-history

Table 1.4 **Current NSLP and SBP Rules (post Healthy, Hunger Free Kids Act implementation)**

I. New Dietary Guidelines established by USDA
- A. Fluid milk restrictions: unflavored milk can be 1% or fat-free; flavored milk must be fat-free
- B. No added trans fat or zero trans fat
- C. Avg. saturated fat content per meal (averaged across week) must be less than 10% of total calories
- D. Fruits and vegetables minimum requirement increase
- E. Avg. calories per meal (averaged across week) must fall within defined ranges for each age/grade group
- F. Serve a variety of vegetables from each of these groups every week: dark green, red/orange, legumes, starchy and 'all other'
- G. Half of grain items offered must be 'whole grain rich'
- H. Number of servings of grain items and meat/meat alternates offered must be within the weekly ranges for each age/grade group
- I. Minimum daily portion sizes and minimum weekly serving requirements for each food group
- J. Reduce sodium content

II. Simplifications to direct certification process and increased access
- A. Foster children and Medicaid recipients automatically eligible
- B. Community eligibility: areas of high poverty qualify for universal free meals

III. Payments and Reimbursement changes
- A. Increased reimbursement rate by 6 cents
- B. Requires school districts to gradually increase price of paid lunches to offset new costs

IV. Increased authority to USDA
- A. Regulation of competitive foods
- B. Nutritional standards applicable to all food sold in schools

V. Requires schools to make free potable water where meals are served

VI. Increased program monitoring

VII. Privacy protection for individual completing application

Source: USDA Comparison of Previous and Current Regulatory Requirements under Final Rule, http://www.fns.usda.gov/sites/default/files/comparison.pdf; Summary of the Healthy, Hunger-Free Kids Act of 2010 from http://www.fns.usda.gov/sites/default/files/PL111-296_Summary.pdf

Table 1.5

Previous and Current School Meal Caloric Standards

Previous (pre HHFKA)	Current (post HHFKA)
Lunch	
grades K-3	grades K-5
Min: 633	Min: 550
Max: none	Max: 650
grades 4-12	grades 6-8
Min: 785	Min: 600
Max: none	Max: 700
grades 7-12 (optional)	grades 9-12
Min: 825	Min: 750
Max: none	Max: 850
Breakfast	
grades K-12	grades K-5
Min: 554	Min: 350
Max: none	Max: 500
	grades 6-8
	Min: 400
	Max: 550
	grades 9-12
	Min: 450
	Max: 600

Source: Comparison of Previous and Current Regulatory Requirements under Final Rule "Nutrition Standards in the National School Lunch and School Breakfast Programs" (published January 26, 2012)

Table 2.1 Expenditures and Caseload in Food and Nutrition Programs

	1990	1995	2000	2005	2010	2012	2013
Expenditures (billions $2013)							
SNAP	27.5	37.6	23.1	37.1	73.0	79.6	79.9
WIC	3.8	5.2	5.4	5.9	6.9	6.8	6.4
NSLP	5.7	6.9	7.4	8.4	10.4	10.5	11.1
SBP	1.1	1.6	1.9	2.3	3.0	3.3	3.5
Averge Monthly Participation (millions persons)							
SNAP	20.0	26.6	17.2	25.6	40.3	46.6	47.6
Annual Participation (millions persons)							
WIC (total)	4.5	6.9	7.2	8.0	9.2	8.9	8.7
Women	1.0	1.6	1.7	2.0	2.1	2.1	2.0
Infants	1.4	1.8	1.9	2.0	2.2	2.1	2.0
Children	2.1	3.5	3.6	4.0	4.9	4.7	4.6
NSLP (total free, reduced, and full paid meals)	24.1	25.7	27.3	29.6	31.8	31.7	30.7
Free meals	9.8	12.4	13.0	14.6	17.6	18.7	18.9
Reduced price meals	1.7	1.9	2.5	2.9	3.0	2.7	2.6
SBP (total free, reduced, and full paid meals)	4.1	6.3	7.6	9.4	11.7	12.9	13.2
Free meals	3.3	5.1	5.7	6.8	8.7	9.8	10.2
Reduced price meals	0.22	0.37	0.61	0.86	1.0	1.0	1.0
Caseload (as % Relevant Population)							
SNAP	8.1	10.1	6.2	8.7	13.2	15.0	15.2
WIC							
Women (as share of all women 18-44)	1.9	2.9	3.1	3.6	3.9	3.7	3.6
Children 1-4	13.5	21.7	23.0	24.6	28.3	29.6	28.5
Infants < 1	35.3	46.5	48.5	50.5	52.9	53.4	53.8
NSLP (as % of children aged 5-17 in inome group)							
Free and reduced meals	25.0	28.0	29.1	32.6	38.4	39.5	39.7
Free meals	21.4	24.4	24.5	22.7	32.8	34.5	35.0
All meals	52.5	50.2	51.5	55.3	59.2	58.3	56.6
SBP (as % of children aged 5-17 in inome group)							
Free and reduced meals	7.6	10.7	12.0	14.3	18.1	19.9	20.6
Free meals	7.2	10.0	10.8	12.7	16.2	18.0	18.8
All meals	8.8	12.4	14.3	17.4	21.7	23.7	24.4

Source: http://www.fns.usda.gov/sites/default/files/pd/17SNAPfyBEN$.xls;
http://www.fns.usda.gov/sites/default/files/pd/SNAPsummary.xls;
http://www.fns.usda.gov/sites/default/files/pd/10sbcash.xls;
http://www.fns.usda.gov/sites/default/files/pd/06slcash.xls;
http://www.fns.usda.gov/sites/default/files/pd/16SNAPpartHH.xls;
http://www.fns.usda.gov/sites/default/files/pd/34SNAPmonthly.xls;
http://www.fns.usda.gov/sites/default/files/pd/15SNAPpartPP.xls;
http://www.fns.usda.gov/sites/default/files/pd/34SNAPmonthly.xls;
http://www.fns.usda.gov/sites/default/files/pd/SNAPsummary.xls; additional Spreadsheets provided by Candy Mountjoy (Candy.Mountjoy@fns.usda.gov), Maeve Myers (maeve.myers@fns.usda.gov) and Gene Austin (Gene.Austin@fns.usda.gov)

Table 2.2: Characteristics of SNAP recipients

	1996	2000	2005	2010	2012
All Food Stamp Households					
Share with children	60	54	54	49	45
Share female heads with children	39	35	32	26	24
Share with elderly members	16	21	17	16	17
Share of individuals <18	47	47	47	44	43
Share of individuals >=65	9	10	7	5	6
Share with gross monthly income below poverty	91	89	88	85	82
Share with no cash income	10	8	14	20	20
Share with any earnings	23	27	29	30	31
Multiple program participation; share with income from:					
AFDC/TANF	37	26	15	8	7
General Assistance	6	5	6	4	3
SSI	24	32	26	21	20
Social Security	19	25	23	21	23
Unemployment Insurance	2	2	2	7	5
Veterans Benefits	1	1	1	1	1
Food Stamp Households without Elderly Members					
Share with children	70	67	64	57	54
Share female heads with children	46	43	38	30	29
Share with elderly members	0	0	0	0	0
Share with gross monthly income below poverty	92	89	89	87	85
Share with no cash income	12	10	16	22	23
Share with any earnings	26	33	35	34	37
Multiple program participation; share with income from:					
AFDC/TANF	43	32	17	9	8
General Assistance	7	5	6	4	3
SSI	17	24	20	16	16
Social Security	9	14	14	13	14
Unemployment Insurance	2	2	2	8	6
Veterans Benefits	1	1	1	1	0

Source: Source: Authors' tabulations of SNAP Quality Control Data. Available at http://hostm142.mathematicampr.com/fns/

Table 2.3: Food Stamps Maximum benefits by household size, 2013

Household Size	Net Income (100% of poverty)	Gross Income (130% of poverty)	Maximum Benefit
1	$931	$1,211	$200
2	$1,261	$1,640	$367
3	$1,591	$2,069	$526
4	$1,921	$2,498	$668
5	$2,251	$2,927	$793
6	$2,581	$3,356	$952
7	$2,911	$3,785	$1,052
8	$3,241	$4,214	$1,202
Each additional person	(+) $330	(+) $429	(+) $150

*Includes Contiguous States, District of Columbia, Guam, and the Virgin Islands.
Does not include Hawaii or Alaska.

Source: Income eligibility standards from http://www.fns.usda.gov/snap/fy-2013income-eligibility-standards; Maximum allotments from http://www.fns.usda.gov/snap/fy-2013-allotments-and-deduction-information

Table 2.4: Characteristics of WIC recipients

	1994	2012
Income below 50% FPL	42	37
Income below 100% FPL	74	73
Income below 150% FPL	91	92
Percent of women participants who are		
Pregnant	52	43
Breastfeeding	17	29
Postpartum	31	28
	100	100
Multiple program participation; percent with income from:		
TANF	29	9
SNAP	40	37
Medicaid	58	72
SNAP and Medicaid	35	33
No TANF/SNAP or Medicaid	36	24

Source: "WIC Participant and Program Characteristics 2012: Final Report" FNS, USDA, December 2013 and "WIC Participant and Program Characteristics 1994" FNS, USDA.
Observations with missing data are excluded from the tabulations.

Table 3.1 **Studies of the Supplemental Nutrition Assistance Program**

Study	Data	Design	Results
Studies of Determinants of SNAP Participation			
Bitler and Hoynes (2014)	Administrative data: SNAP caseloads by state and month 1980-2013, normalized by state x year population	State panel fixed effects model Main independent variable: UR and interactions for subperiods	For full period a one percentage point increase in the UR leads to a 3.4 percent increase in caseloads per capita; larger effects (though not statistically different) in the Great Recession
Currie, Grogger, Burtless, and Schoeni (2001)	CPS 1981-1999 and administrative data on state-year SNAP caseloads	State panel fixed effects model Main independent variables: UR, SNAP policy variable (recertification length), welfare reform	Caseload decreases due to welfare reform, reduction in UR and reductions in recertification period
Figlio, Gundersen, and Ziliak (2000)	Administrative data: Food Stamp caseloads, state x tear 1980-1998	State panel fixed effects model Main independent variables: UR (and lags), growth of EPOP (and lags), SNAP policies, welfare policies	Reduction in SNAP in 1990s due primarily to economy and less to welfare reform
Ganong and Liebman (2013)	SIPP 2007-2011 Administrative country SNAP data: 1990-2011	State (or county) fixed effects model, including models with lags Independent variables include: UR (and lags), SNAP policy, welfare policy	Most of the increase in SNAP between 2007-2011 is due to the macroeconomy; SNAP relaxing of income and asset limits in 2000s (Broad Based Categorical Eligibility) accounts for 8% of the increase in enrollment; relaxing of ABAWD accounts for 10%

Kabbani and Wilde (2003)	Administrative data: Food Stamp Quality Control Data, 1990-2000, state x year	State panel fixed effects model Main independent variables: UR (and lags), SNAP policy variable (share of persons facing recertification periods ≤ 3 months)	Increase in 10 pp of share ≤ 3 months leads to a 2.7 percent reduction in caseload/pop; reduced error rates by 0.8 pp
Ziliak (2013)	CPS 1980-2011 N=5,552,486 individuals residing in 2,053,018 households pooled across all years (173,515 persons in a typical yr across sample period)	State fixed effects model, including models with lags Independent variables include: UR (and lags), SNAP policy, welfare policy	Increase in participation from 2007-2011—50% due to higher UR, 30% due to policy changes, remainder due to demographics and other
Ziliak, Gundersen, and Figlio (2003)	Administrative data: annual state caseload 1980-1999	State panel fixed effects model; estimated static and dynamic (including lags) Main independent variables include: state-year UR, welfare policies	A one percentage point increase in the unemployment rate leads to a 2.3% increase after one year and 8% decrease in the long run; a 10-percentage point increase in the share of a state's population waived from rules limiting food stamp receipt among ABAWDs results in a 0.5% increase in contemporaneous caseloads

(*continued)*

Table 3.1 (continued)

Study	Data	Design	Results
Studies of Impact on Consumption			
Beatty and Tuttle (2012)	CEX 2007-2010; limit sample to households with total expenditures ≥150% of average expenditures of SNAP recipients N=29,000 household-quarters	Difference in difference design comparing SNAP recipients to nonrecipients before and after SNAP benefit increases (the ARRA 2009 increase in SNAP benefits being the largest increase); matching method used to improve control group; model the effect of an increase in benefits using an Engel curve approach	The ARRA policy change [increase in SNAP benefit of 13.6 percent] led to a 6.0% increase in food at home; no significant effects on food-away from home
Blundell and Pstaferri (2003)	PSID 1978-1992; male headed married couples age 25-65 in stable households N=2,469 unique households	Panel data model with household fixed effects and parametric modeling for error (permanent income shock, measurement error in income, measurement error in consumption and taste); framework allowed for self-insurance, in which consumers smooth idiosyncratic shocks through saving; also considered the complete markets assumption in which all idiosyncratic shocks are insured	The effect of permanent income shocks on consumption decline by about one-third with SNAP

Gundersen and Ziliak (2003)	PSID 1980-1999, household heads, at risk of SNAP samples: (i) income <130% FPL, (ii) income ever <130% FPL, (iii) average income in bottom quartile of sample average income N=8,485 unique households	Panel data model with household fixed effects; model 1 is first difference in log income, with an analysis of variance of the residual; model 2 is an IV of change in log consumption on the change in log income (instruments are changes in the head's labor supply)	Among families at risk of SNAP receipt, food stamps reduced income volatility by about 12% and food-consumption volatility by about 14%
Hoynes and Schanzenbach (2009)	PSID 1968-1978; three samples: (i) all nonelderly headed households, (ii) nonelderly headed household with <12 years of education, (iii) female headed households N=39,623 family-year	Difference and difference and event study model using rollout of SNAP across counties between 1961 and 1975; triple difference using across group variation (e.g. high vs low potential SNAP participation) as third differencing	Total food consumption increases with introduction of FSP; MPC out of FSP is 0.163 and MPC out of cash income is 0.087
Studies of Impact on Food Insecurity			
Borjas (2004)	CPS-FSS 1995-1999	Estimate effect of public assistance receipt on FI using welfare reform in two-sample IV, comparing noncitizens versus natives Instrument = triple difference between state x year x citizenship status	Reduction in proportion of welfare recipients by 10 percentage points increased FI by about 5 percentage points
Depolt, Moffitt, and Ribar (2009)	Longitudinal data from the Three-City Study (Boston, Chicago, and San Antonio); low-income families (below 200% of the poverty line) N=2973 person-year observations	Use household fixed effect model, identifying effects of SNAP participation of off switchers (on or off program); multiple indicator multiple cause models	Participation in SNAP is associated with fewer food hardships

(*continued)*

Table 3.1 (continued)

Study	Data	Design	Results
Gibson-Davis and Foster (2006)	ECLS-K, fall 1998 and spring 1999; households with incomes < 130% of FPL N=4,276	Propensity score matching with 2 models	Food stamps do not decrease the probability of being food insecure, although they lessen the severity of the problem according to some models
Gregory, Rabbitt, and Ribar (2013)	CPS-FSS 2009-2011, households ≤130% FPL	Three designs to estimate effect of SNAP on FI: (i) propensity score matching, (ii) one year apart longitudinal estimators, (iii) IV (instruments: household head being a non-citizen, SNAP certification interval in state)	Propensity score and longitudinal models show positive effect of SNAP on FI; inconsistent results for IV
Mykerezi and Mills (2010)	1999 PSID; samples: (i) ≤150% FPL (N=1608), (ii) ≤200% FPL (N=2237), (iii) ≤250% FPL (N=2837)	IV model, estimate of SNAP on FI; also relate loss of SNAP (involuntary, "due to government office decision") to change in FI Instrument: state SNAP underpayment rate and overpayment rate	FSP participation lowers FI by 19% (cross section IV using state policy variables could capture other aspects of state)
Ratcliffe, McKernan, and Zhang (2011)	1996, 2001, 2004 SIPP panels; low-income households (<150% of poverty threshold)	IV using state SNAP policies as instrument: use of biometric technology, outreach spending, full immigrant eligibility, and partial immigrant eligibility	SNAP reduces the likelihood of being food insecure by 30% and very food insecure by 20%

Schmidt, Shore-Sheppard, and Watson (2013	CPS 2001-2009, families w/at least one child under 18, < 300 % of the poverty line, no immigrants, particular focus on single-parent families N=28,189 (first stage, december) N=68,702 (second stage, march)	IV approach, effect of program benefits on FI; instrument actual benefits with simulated benefits eligibility and potential benefit calculator	$1000 in potential benefits (benefits for which a family is eligible) reduces low food security by 2 percentage points on a base rate of 33 percent; a treatment on the treated $1000 in benefits reduces low food security by 4 percentage points
Shaefer and Gutierrez (2013)	SIPP 1996, 2001, 2004, households with children and < 150% FPL	IV with instrument: state-year share < 3 month short recertification; implementation of biometric technology	SNAP reduces household food insecurity by 12.8 percentage points
Wilde and Nord (2005)	CPS-FSS 2001-2002, longitudinally linked N=17,331 matched households	Household fixed effects using transitions onto and off of SNAP	Transitions into SNAP associated with transitions into FI

(*continued)*

Table 3.1 (continued)

Study	Data	Design	Results
Yen, Andrews, Chen, and Eastwood (2008)	1996-1997 National Food Stamp Program Survey N=2,179 households	IV approach to estimate effect of SNAP participation on FI Instruments: state policy variables (recertification length, EBT availability), pop. share of immigrants & 4 dummy variables on stigma to capture the effect of welfare stigma: whether the individual had avoided telling (people about receiving food stamps), shopped (at stores where (they are) unknown, (been treated with) disrespect shopping (with food stamps), or (been treated with) disrespect telling (people about being on food stamps)	Participation in SNAP reduces FI by 0.4 percentage points (7%)
Studies of Impacts on Child Health Outcomes			
Almond, Hoynes, and Schanzenbach (2011)	National Vital Statistics data on births 1968-1977	Difference in difference and event study analysis of food stamp program rollout; examine effects of exposure to SNAP on birth outcomes, low birth weight	SNAP exposure leads to significant reduction in low birth weight births; no significant effects for infant mortality

Currie and Moretti (2008)	Vital statistics data on California births 1960-1974	Difference in difference analysis of food stamp program rollout in California; examine effects of exposure to SNAP on birth weight	SNAP exposure leads to reduction in birth weight
Gibson (2004)	NLSY-79 child sample N= 3831 (girls) N=4012 (boys), person-years	Examine effects of SNAP participation over past 5 years on overweight, by gender and age; family and child fixed effects	Mostly insignificant effects, but signs indicate reduction in overweight for boys and increase in overweight for girls
Kreider, Pepper, Gundersen, and Jolliffe (2012)	NHANES 2001-2006, children 2-17 in households w/income < 130% FPL N= 4,418	Partial identification bounding methods to address selection and measurement error (underreporting) of SNAP; range of models with weaker and stronger assumptions	Under weakest nonparametric assumptions, can not rule out positive or negative effects of SNAP on obesity; tightest bounds indicate beneficial effects of SNAP
Schmeiser (2012)	NLSY-79, children ages 5-18 N=8409 (boys) N=8144 (girls)	Examine effects of SNAP participation over past 5 years on distribution of BMI via IV Instruments: state-level SNAP policies including recertification period length, fingerprinting, and vehicle asset exclusions	SNAP participation significantly reduces BMI for most child gender-age groups
Vartanian and Houser (2012)	PSID 1968-2005	Sibling fixed effects model to relate childhood participation in SNAP to adult BMI	Positive effect of childhood SNAP participation on adult BMI

(*continued)*

Table 3.1 (continued)

Study	Data	Design	Results
Studies of Impact on Adult Health Outcomes			
Fan (2010)	NLSY79 1985-1988 N=6,111	Use propensity score weighting to construct control group along with within person variation in SNAP participation; estimate both short-term (one-year participation) and long-term (three-year participation) treatment effects	No significant effects of SNAP on obesity rate, overweight rate, or BMI
Gibson (2003)	NLSY79, ages 20-40 N=13,390	Examine effects of SNAP participation (past year, past 9 years) on obesity; individual fixed effects	Current and longer term SNAP participation increased obesity for women
Hoynes, Schanzenbach, and Almond (2013)	PSID 1968-2009	Difference in difference and event study analysis of food stamp program rollout; examine effects of childhood exposure to SNAP on adult health and economic outcomes	SNAP exposure, especially in early childhood (age ≤ 4) leads to significant reduction in metabolic syndrome in adulthood; SNAP exposure throughout childhood leads to improvements in economic outcomes for women but not men
Kaushal (2007)	NHIS 1992-2000	Estimate effect of SNAP on obesity using welfare reform in two-sample IV, comparing immigrants to natives Instrument: triple difference between state x year x citizenship status	Insignificant effect of SNAP on obesity

Meyerhoefer and Pylypchuk (2008)	Medical Expenditure Panel Survey 2002-2003, adults age 18-64 eligible for FSP N=6,644	Individual fixed effects and IV Instruments: state level SNAP policies including expenditures on outreach, fingerprinting, recertification length	SNAP leads to increase in overweight and obesity for women; no significant effects for men (instrument does not vary over time, so could capture cross-sectional geographic effects)
Studies of Impact on Labor Supply			
Hoynes and Schanzenbach (2012)	PSID 1968-1978, family head <65 N=48,168 family-years Three samples: (i) all nonelderly headed households, (ii) nonelderly headed household with <12 years of education, (iii) female headed households	Difference and difference and event study model using rollout of SNAP across counties between 1961 and 1975; triple difference using across group variation (e.g. high vs low potential SNAP participation) as third differencing	Hours of work and employment decline with SNAP introduction, with the largest effects for female headed households

Table 3.2 Studies of the WIC Program

Study	Data	Design	Results
Studies of Determinants of WIC Participation and Selection			
Bitler and Currie (2005)	Pregnancy Risk Assessment Monitoring System (PRAMS), 1992-1999, medicaid paid births N= 60,731	Comparison of WIC versus non-WIC within sample of Medicaid funded births; examine impacts on WIC participation and effect of WIC on birth outcomes	WIC participants are negatively selected with adverse measures for education, age, marital status, presence of father smoking obesity, employment, and housing characteristics; WIC participation is associated with improved birth outcomes: 6-7 percent more likely to have begun prenatal care in the first trimester, and 2 percent less likely to bear infants who are below the 25th percentile of weight given gestational age or to bear infants of low birth weight
Bitler, Currie, and Scholz (2003)	CPS survey 1998-2001, Administrative WIC counts 1992-2000	State fixed effects panel analysis using variation in labor market characteristics and WIC policies by state and year	State unemployment rates and poverty rates are not important determinants of state WIC caseloads; the presence of WIC policies such as requiring proof of income (before required nationally) and stricter program rules lower participation
Corsetto (2012)	Administrative WIC counts, 1990-2010	State fixed effects panel analysis using variation in unemployment rate by state and year	No relationship between state unemployment rates and WIC participation for full period (1990-2010); modest countercyclical effect for 2000-2010

(continued)

Study	Data	Design	Results
Rossin-Slater (2013)	Administrative birth records, Texas, 2005-2009, linked to administrative records on openings and closings of WIC clinics N= 612,694	IV-maternal fixed effect model Instrument: zip code presence of WIC clinics	The presence of a WIC clinic in a mother's ZIP code of residence during pregnancy increases her likelihood of WIC food receipt by about 6%; access to WIC increases pregnancy weight gain, birth weight (by 22-32 g), and breastfeeding (4 percentage points for mothers with high school degree or less)
Studies of Effects on Pregnancy and Birth Outcomes			
Bitler and Currie (2005)	Pregnancy Risk Assessment Monitoring System (PRAMS), 1992-1999, medicaid paid births N= 60,731	Comparison of WIC versus non-WIC within sample of Medicaid funded births; examine impacts on WIC participation and effect of WIC on birth outcomes	WIC participants are negatively selected with adverse measures for education, age, marital status, presence of father smoking obesity, employment, and housing characteristics; WIC participation is associated with improved birth outcomes: 6-7 percent more likely to have begun prenatal care in the first trimester, and 2 percent less likely to bear infants who are below the 25th percentile of weight given gestational age or to bear infants of low birth weight
Currie and Ranjani (2014)	Administrative birth records, New York City, 1994-2004 N= 1.2M	Maternal fixed effect model	WIC leads to improved birth outcomes: increased birth weight and reduced preterm birth, small for gestational age, and low weight gain; effects found for subsample of full term births (to address gestational age bias)

(continued)

Study	Data	Design	Results
Figlio, Hammersma, and Roth (2009)	Administrative birth data, Florida, 1997-2001, women 18-44, matched to school records of their older siblings (to identify "marginally eligible" and "marginally ineligible" families) and WIC records (to identify date of WIC participation) N= 2,530 marginally ineligible and 1,744 marginally eligible (multiple-birth families where there is at least a 6 yr gap in age between two siblings)	Difference-in-differences and event study approach, using variation in eligibility (marginally ineligible versus marginally eligible, using longitudinal data on free and reduced price lunch status of older sibling) and a policy change (increasing income reporting requirement); also estimated as IV where the instrument is the interaction of post-policy change and marginal eligibility	WIC reduces low birth weight but has no effect on average birth weight, gestational age, or premature birth
Hoynes, Page, and Stevens (2012)	National Vital Statistics data on births 1971-1975, 1978-1982	Difference-in-differences and event study analysis of county level WIC program rollout; examine effects of exposure to WIC on birth outcomes, low birth weight	WIC exposure leads to significant increase in average birth weight and a decrease in low birth weight births; effect on average birth weight range from 2-7 grams among infants born to mothers with low education levels (treatment on the treated effects of 18-29 grams)
Joyce, Gibson, and Colman (2005)	New York City administrative birth data, 1988-2001, Medicaid paid births N>800,00 births	Comparison of WIC versus non-WIC within sample of Medicaid funded births; examine impacts on WIC participation and effect of WIC on birth outcomes	WIC participation leads to improvements in birth weight, low birth weight, and gestational age; no impacts on weight for gestational age; largest effect for African Americans

Study	Data	Design	Results
Figlio, Hammersma, and Roth (2009)	Administrative birth data, Florida, 1997-2001, matched to school records of their older siblings (to identify "marginally eligible" and "marginally ineligible" families) and WIC records (to identify date of WIC participation) N= 2,530 marginally ineligible and 1,744 marginally eligible (multiple-birth families where there is at least a 6 yr gap in age between two siblings)	Difference-in-differences and event study approach, using variation in eligibility (marginally ineligible versus marginally eligible, using longitudinal data on free and reduced price lunch status of older sibling) and a policy change (increasing income reporting requirement); also estimated as IV where the instrument is the interaction of post-policy change and marginal eligibility	WIC reduces low birth weight but has no effect on average birth weight, gestational age, or premature birth
Hoynes, Page, and Stevens (2012)	National Vital Statistics data on births 1971-1975, 1978-1982	Difference-in-differences and event study analysis of county level WIC program rollout; examine effects of exposure to WIC on birth outcomes, low birth weight	WIC exposure leads to significant increase in average birth weight and a decrease in low birth weight births; effect on average birth weight range from 2-7 grams among infants born to mothers with low education levels (treatment on the treated effects of 18-29 grams)
Joyce, Gibson, and Colman (2005)	New York City administrative birth data, 1988-2001, Medicaid paid births N>800,00 births	Comparison of WIC versus non-WIC within sample of Medicaid funded births; examine impacts on WIC participation and effect of WIC on birth outcomes	WIC participation leads to improvements in birth weight, low birth weight, and gestational age; no impacts on weight for gestational age; largest effect for African Americans

(continued)

Study	Data	Design	Results
Rossin-Slater (2013)	Administrative birth records, Texas, 2005-2009, linked to administrative records on openings and closings of WIC clinics N= 612,694	IV-maternal fixed effect model Instrument: zip code presence of WIC clinics	The presence of a WIC clinic in a mother's ZIP code of residence during pregnancy increases her likelihood of WIC food receipt by about 6%; access to WIC increases pregnancy weight gain, birth weight (by 22-32 g), and breastfeeding (4 percentage points for mothers with high school degree or less)

Table 3.3 Studies of the National School Lunch Program

Study	Data	Design	Results
Studies of Impact on Dietary Quality and Food Insecuirty			
Gleason and Suitor (2003)	CSFII 1994-1996, individual dietary recall data, children age 6-18	Individual fixed effects, comparing dietary intake on day ate school lunch with day did not eat school lunch	No impact on calories at lunch or over 24 hours; increased consumption of fat and protein; decreased consumption of added sugars; increased intake of six vitamins and minerals
Nord and Romig (2006)	CPS-FSS 1995-2001, survey alternates monthly in year	Difference in differences estimate of food insecurity during summer vs. school year for families with preschool vs. school-age children	Food insecurity relatively higher in the summer for households with school-age children; difference smaller in states that provide more summer food service lunches
Stuides of Impact on Child Health Outcomes			
Gundersen, Kreider, and Pepper (2012)	NHANES 2001-2004, individual data	Nonparametric partial identification	Receipt of free and reduce-price lunches reduces the incidence of poor health by at least 3.5 percentage points , and reduces obesity by at least 4 percentage points
Mirtcheva and Powell (2013)	PSID Child Development Supplement 1997 and 2003, individual panel data, children ages 6-18	Individual-level fixed effects, change in participation across waves	No significant effect of NSLP participation on body weight for the full sample or by gender

(continued)

Study	Data	Design	Results
Schanzenbach (2009)	Early Childhood Longitudinal Data, K-5, individual panel data	Change over time; regression discontinuity at eligibility for reduced-price lunch	NSLP increases obesity rates by 1 ppt/year in change regression; increases obesity in RD
Studies of Impact on Student Achievement			
Dunifon and Kowaleski-Jones (2003)	PSID Child Development Supplement 1997, individual data, children age 6-12	Sibling fixed effects, comparing health, behavior and achievement outcomes across siblings who differ in NSLP participation	Negative OLS relationship between NSLP participation and child behavior & achievement; no between-sibling differences in outcomes predicted by NSLP participation
Hinrichs (2010)	Outcomes from 1976-1980 NHIS and 1980 Census, state-level factors predicting treatment	IV exploiting change in funding formula over time, across states	Increasing NSLP exposure by 10 percentage points increased completed education by .365 years for women, nearly 1 year for men

Table 3.4 Studies of the School Breakfast Program

Study	Data	Design	Results
Studies of Determinants of Participation			
Leos-Urbel, Schwartz, Weinstein, and Corcoran (2013)	Individual data: test scores, attendance, meal participation. NYC public elementary and middle schools, 2002-08	Triple-difference approach, using difference in timing of introduction of universal free breakfast and difference across student eligibility for free meals prior to policy change	Universal free breakfast increased breakfast participation both for students who experienced a decrease in the price of breakfast and for free-lunch eligible students who experienced no price change; small positive effect on attendance for Black and Asian students, no impacts on student test scores
Ribar and Haldeman (2013)	Individual data: test scores and attendance in Title I Elementary schools in Guilford County, North Carolina	Difference-in-difference study of termination of UFB program in some schools	Termination of UFB reduced SBP participation substantially, largest reductions for students not eligible for free or reduce-price meals; no change in test scores
Schanzenbach and Zaki (2014)	Individual data: participation and outcomes, students grades 2-6 in 153 elementary schools in 6 districts	Random assignment within matched-pair schools to universal free breakfast or traditional program; compare within matched pairs schools that opt for cafeteria breakfast or Breakfast in Classroom	Universal free breakfast increases participation in SBP, larger participation effects for BIC; no change in likelihood of eating breakfast, few impacts on measures of dietary quality, health or achievement outcomes

(continued)

Study	Data	Design	Results
Studies of Impacts on Dietary Quality and Food Insecurity			
Bhattacharya, Currie, and Haider (2006)	NHANES-III 1988-1994, 5-16 year olds, individual data	Difference-in-differences comparing students in school to those on school vacation, across schools that do and do not offer SBP	No impact of SBP the calories consumed or probability eats breakfast, but improves nutritional quality as measured on HEI and in blood serum; no measured positive spillover effects for other household members
Crepinsek, Singh, Bernstein, and McLaughlin (2006)	Individual data: dietary recall study, students grades 2-6 in 153 elementary schools in 6 districts	Random assignment within matched-pair schools to universal free breakfast or traditional program	Treatment school students more likely to consume a nutritionally substantive breakfast; no change in 24-hour dietary intakes or in rate of breakfast skipping
Millimet, Tchernis, and Husain (2010)	Early Childhood Longitudinal Data, K-5 1998-99 N=13,531	Growth from kindergarten entry, selection model for school participation in SBP, Altonji et al. approach to assess selection on unobservables	School breakfast decreases obesity, school lunch increases obesity

(continued)

Study	Data	Design	Results
Studies of Impact on Student Achievement			
Dotter (2012)	Individual data: achievement, attendance, behavior in San Diego elementary schools, 2002-2011	Difference-in-differences on UFB and BIC introduction across schools that were vs. were not treated	UFB increased achievement in math (0.15 SD) and reading (0.10 SD); larger gains where fewer students were previously participating; no incremental effect of BIC vs. UFB
Frisvold (2012)	Test score data from 2003 National Assessment of Educational Progress; school SBP availability, consumption, attendance, and behavior from ECLS-K	States require schools to participate in SBP if the school exceeds a threshold percent eligible for free/reduced price meals, thresholds differ across states; difference-in-difference and RD around thresholds	SBP improves test scores in math (0.09 SD) and reading (0.05-0.12 SD), and improves the nutritional content of breakfast
Imberman and Kugler (2014)	Individual data: test scores and attendance (2003-10) and BMI (2009-10) in a large urban school district in the Southwest US	Difference-in-difference using quasi-random timing of introduction of new Breakfast in the Classroom program, all schools eventually treated	Exposure to BIC for 1 or more weeks increases achievement in math by 0.09 SD and reading by 0.06 SD; no impact on grades or attendance