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Abstract

Low take-up by elderly Americans in most means-tested federal programs is a persistent and puzzling phenomenon. This paper seeks to measure the causal effect of the benefit levels on elderly enrollment in two public assistance programs – the Supplemental Nutrition Assistance Program (SNAP) and the Supplemental Security Income (SSI) program – by using the variation in SNAP and SSI eligibility and benefit levels introduced by Social Security retirement benefits. Our findings are three-fold. First, the low take-up among the elderly is not driven by changes in the composition of the eligible pool: individuals who become eligible as they age exhibit average take-up patterns that are similar to those who were eligible before reaching Social Security benefit claiming ages. Second, Social Security has a significant impact on the use of public assistance programs among the elderly, because the increase in income decreases the potential benefits available from public programs. Third, we estimate different behavioral responses to SNAP and SSI programs: a $100 increase in SSI benefits leads to a 4-6-percentage-point increase in the probability of taking up SSI, but we are unable to estimate consistent results on how benefits impact the take up for SNAP. Together with the fact that eligible individuals who begin receiving Social Security benefits continue to participate in SSI more often than they maintain SNAP enrollment, we posit that the different estimated behavioral responses could be due to individual preferences for cash over in-kind transfers.

Introduction

Low take-up by the elderly in most means-tested transfer programs is a persistent and puzzling phenomenon: estimated elderly take-up rates for Supplemental Security Income (SSI) range from 38 percent to 73 percent (for example, Coe 1983; Shields et al. 1990; McGarry 1996; Strand, Rupp, and Davies 2009) and less than 35 percent for the Supplemental Nutrition Assistance Program (SNAP) (Haider, Jacknowitz, and Schoeni 2003; Wolkwitz and Leftin 2008; Wu 2009). This low take-up is especially surprising since the elderly have fewer opportunities to work their way out of poverty and might be expected to be more reliant on the safety net than their younger counterparts. To the extent that low take-up of the elderly in means-tested programs reflects serious unmet need, this is an issue of public concern.

Despite this well-documented counterintuitive phenomenon, not much is known about the reasons behind the low take-up rate in means-tested programs. While an extensive literature has explored program participation among the eligible population broadly, only a few have focused specifically on the elderly.[1] Further, most of these studies are limited to measuring correlations between potential benefit levels and program participation. SNAP and SSI are national programs with relatively uniform eligibility criteria and benefit levels[2]; though state SSI Supplement programs introduce state-level benefit variation, this variation is likely correlated with the cost of living within the state and is not an ideal source for identification. As a result, the inherent selection issue that must be addressed before causal estimates can be measured – individuals who are in the program may be different from non-participating eligible individuals – is difficult to address. McGarry (1996) tries to identify the causal relationship between SSI benefit levels and take-up among the elderly. However, the validity of the exclusion restrictions of McGarry's instrumental variables has been questioned by other researchers (Elder and Powers 2004).[3] Thus, relatively little is known about what factors matter most in the take-up decision of the elderly, how these factors and their relative importance differ by age, or how enrollment in transfer programs might be increased.

[1] Examples include McGarry 1996; Choi 1998; Davies 2002; Haider, Jacknowitz, and Schoeni 2003; Levy 2008; and Wu 2009.

[2] There are some very recent variations in SNAP eligibility rules across states. In 2009, 13 states had exempted all or almost all households from the asset test, and all states exclude some or all vehicles from countable assets. Many states supplement federal SSI benefit levels.

[3] More details about McGarry (1996) are in the background section.

Using the *Health and Retirement Study* (HRS) linked to administrative earnings records and geographic identifiers, this paper examines the take-up decision of the elderly in SNAP and SSI programs by exploiting the interaction between Social Security Old-Age and Survivor Insurance benefits and public assistance programs. Social Security interacts with means-tested transfer programs in two ways. First, by providing a considerable source of income, Social Security changes who is eligible for means-tested transfer programs; in 2011, 14.5 million people were lifted out of poverty by Social Security benefits (Van de Water and Sherman, 2012). If the likelihood of take-up varies among individuals, Social Security benefits could have a large impact on the take-up rate by changing the composition of the eligible pool. Second, among those still eligible, receiving retirement income from Social Security changes the expected public assistance benefit amount individuals are eligible to receive from means-tested transfer programs. Since the take-up decision is likely impacted by the expected benefit of participating, this factor could be another explanation for the different take-up rates between the young and the elderly.

The program interactions with Social Security provide age-related variation in eligibility and benefit levels of means-tested public transfer programs that can be exploited to estimate the causal impact of the expected public assistance benefit level on the take-up of means-tested programs. We develop an instrumental variable using the exogenous variation in potential SNAP/SSI benefits caused by potential receipt of Social Security benefits. This instrumental variable captures the fact that Social Security benefits, the major source of income for the low-income elderly population, reduce SNAP/SSI payment on nearly a dollar-for-dollar basis.

This paper contributes to the literature in several ways. First, we use instrumental variables techniques to exploit exogenous changes in the benefit level to estimate the causal relationship between take-up and benefit levels in two means-tested programs. Second, we improve on measurement error issues by using Social Security administrative earnings records matched to survey data and using instrumental variable techniques. Finally, traditional economic theory suggests that cash transfers are superior to in-kind transfers in terms of the recipient's utility: in-kind transfers may constrain the behavior of the recipients, while cash transfers do not.

This paper examines whether the interactions with Social Security have different behavioral responses between these cash (SSI) and in-kind (SNAP) transfer programs.[4]

Our findings are summarized as follows. First, we do not find evidence that the low take-up among the elderly is driven by changes in the pool of eligible individuals that have differential take-up patterns. However, Social Security has a significant impact on the use of public assistance programs among the elderly, because the increase in income decreases the potential benefits available from public programs. Our estimates are inconclusive about the behavioral response to a change in SNAP benefits,[5] but our estimates suggest that a $100 increase in SSI benefits leads to a 4-6-percentage-point increase in the probability of participating in SSI, a smaller effect than traditionally found in the literature.[6] These findings are robust across different model specifications and different definitions of the eligible population. The average SSI benefit for eligible individuals aged 50 to 62 is about $472 per month, and the benefits for those above Social Security's Early Eligibility Age of 62 is approximately $229. A simple back-of-the-envelope calculation shows that Social Security decreases the take-up rate of SSI by 10-15 percentage points. Together with the fact that eligible individuals more often continue participating in SSI after receiving Social Security benefits than they maintain SNAP enrollment, we posit that the different estimated behavioral response could be due to individual preference for cash over in-kind transfers.

The paper proceeds as follows. Section 2 briefly outlines the SNAP and SSI programs and reviews the existing literature. Section 3 describes the data, sample construction, and measurement error, and presents the descriptive patterns of eligibility and participation. Section 4 discusses interactions between the Social Security retirement program and means-tested transfer programs. Section 5 discusses empirical methods and summarizes the main results. Section 6 summarizes sensitivity tests, followed by concluding remarks in Section 7.

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[4] Since SNAP benefits are now received as a debit card balance, one could consider them as a cash equivalent. However, the benefits can still be used only in a subset of stores to buy a subset of goods.

[5] Haider, Jacknowitz, and Schoeni (2003) find that SNAP benefits are negatively correlated to participation decision among the elderly, while Wu (2009) finds a positive correlation but the magnitude is fairly small.

[6] The literature fails to reach a consensus on the impact of SSI benefits on program participation. For instance, McGarry (1996) using the 1984 SIPP find that a 25 percent increase in benefits induces a 6.1 percentage point increase in the probability of participating. Using HRS Ahead 1993-1994 waves, Davies (2002) finds a $100 increase in benefits leads to 6-15 percentage point increase in participation. On the other hand, using SIPP 1984-1997, Elder and Powers (2004) report that the influence of expected SSI benefits has declined over time. They find insignificant results of benefits on participation using different sample specification, alternative approaches to imputing the expected SSI benefit, and more detailed information on application and receipt culled from administrative files.

Background

The Supplemental Nutrition Assistance Program. SNAP is the largest nutrition program for low-income Americans and a mainstay of the federal safety net. To receive SNAP, households must meet three financial criteria: a gross-income test, a net-income test, and an asset test. [7] A household is automatically, or "categorically," eligible for SNAP when they are receiving SSI, the Temporary Assistance for Needy Families, or General Assistance programs.[8]

Eligibility rules for households with an elderly (age 60 and over) or disabled member are more liberal than for the rest of the population. First, these households are exempt from the gross income test. Second, the more generous net income test removes the cap on the shelter deduction and includes a deduction for out-of-pocket medical expenses.[9] Third, the asset limit increases from $2,000 to $3,250.

The amount of SNAP benefit that a household receives is equal to the maximum benefit level (which varies by household size) less 30 percent of the household's net income (reflecting that an average household will spend approximately 30 percent of its net income on food). In 2012, an eligible two-person household could receive SNAP benefits of between $16 and $367 each month.

The Supplement Security Income Program. Designed to provide financial support to low-income blind, disabled, and elderly individuals, the SSI program is currently the largest federal means-tested cash assistance program in the United States.[10] The SSI program provides a guaranteed income to all eligible individuals. In 2012, the income guarantees were $698 ($1,011) per month for a single individual (couple) living in his own home. The SSI benefit individuals

[7] Under SNAP rules, a household is defined as individuals who share a residential unit and purchase and prepare food together. *Gross income* is defined as the total income for all household members, including that gained from working, investment, and transfers, but excludes most noncash income and in-kind benefits. The gross income limit is set at 130 percent of the poverty line ($1,640 per month for fiscal year 2012 for a two-person household). *Net income* is then computed by allowing for various deductions, including standard, earned income, excess shelter, medical expense, child support payments, and dependent care deductions from the household's gross income, with the net income limit set at 100 percent of the poverty line ($1,261). The asset limit in 2012 was $2,000.

[8] Able-bodied adults between 18 and 50 who do not have any dependent children can get SNAP benefits only for 3 months in a 36-month period if they do not work or participate in a workfare or employment and training program other than job search. We did not take the employment requirement into consideration because our sample from the HRS is the population over the age of 50.

[9] Out-of-pocket medical expenses in excess of $35 per month per household can be deducted.

[10] In 2012, federal payments under SSI totaled $52 billion, compared to just $16.75 billion in federal assistance payments made under the Temporary Assistance for Needy Families program.

receive is the difference between the income guarantee and their countable income.[11] A resource test is also required for participation in SSI.[12]

Individuals between 18 and 64 must meet the income and resource tests and be determined to be unable to work for at least one year due to a medical impairment.[13] For the aged (65 and over), individuals need to meet only the income and resource tests to be eligible. In addition to the federal program, states have the option of offering supplemental SSI benefits. In 2012, 30 states offered supplements to elderly individuals or couples living independently, and a total of 45 states offered at least some form of supplemental benefit, which can be substantial. For example, the income guarantee for a couple living in California in 2012 is $1,407 ($396 above the federal level), while in New York the income guarantee is $1,115. If a state is willing to administer its own program, it is free to alter the eligibility requirements as it wishes, including imposing more or less stringent income and resource tests. While federal benefits are indexed for inflation, state benefits are not.

Literature Review. Numerous studies have examined why people eligible for government transfer programs do not participate in these programs. The cost/benefit framework has been the basis for investigations of nonparticipation in social programs: individuals choose to enroll only if the benefits of participation exceed the costs. The findings of Blank and Ruggles (1996) support this claim. Using data from the *Survey of Income and Program Participation* (SIPP), they show that low participation by women in the Aid to Families with Dependent Children and SNAP stems from would-be participants' expectations of low benefits. In her study of SSI participation among the elderly, McGarry (1996) reports that larger expected SSI benefits significantly increase the probability that an individual will participate in the program. Davies (2002) also suggests that the calculated benefits are positively correlated to the participation decision. Wu (2009) finds that the elderly's decision to participate in SNAP is strongly

[11] Countable income disregards the first $20 of income from all sources, the first $65 of earned income, and one-half of additional earnings per month. Other disregards are home energy assistance payments, tuition benefits, disaster relief, and the value of SNAP benefits.

[12] A resource test is also required for participation in SSI. Generally, countable assets cannot exceed $2,000 for an individual and $3,000 for a couple, but owner-occupied housing, regardless of value, and one car that used for transportation of the beneficiary or member of the beneficiary's household are excluded. There is a complex set of rules regarding how assets other than cash are considered.

[13] The disability definition and determination process is identical to that of the Social Security Disability Insurance (DI) program. See Wixon and Strand (2013) for details on the disability determination process.

associated with economic incentives. The lower the expected SNAP benefit level and a relatively better financial situation for the elderly account for about one-third of the difference in SNAP take-up between the elderly and the non-elderly.[14]

While there is an extensive literature on nonparticipation, only a few studies have focused specifically on older adults, despite the fact that low take-up by the elderly in means-tested programs has been perceived as a serious problem for over a quarter of a century (McGarry 1996, Davies 2002, Elder and Powers 2004 on SSI; Haider, Jacknowitz, and Schoeni 2003, Levy 2008, and Wu 2009 on SNAP).[15,16] While the existing research attributes the low take-up among eligible elderly largely to the fact that many elderly poor expect to receive only a very modest cash payment, identification is difficult because SNAP and SSI are national programs with virtually uniform eligibility criteria and benefit levels.[17] State SSI Supplement programs introduce state variation in benefits, but this variation does not solve the identification problem if it is correlated with the cost of living in the state.[18] Most of the existing studies are limited to measuring correlations between potential public assistance benefit levels and program participation.

McGarry (1996) proposes a two-stage procedure in which the computed expected SSI benefit is first regressed on household characteristics and the (federal + state) maximum benefit. This predicted value then enters into a probit for the take-up decision. The two-stage procedure will yield consistent estimates only if a) the variance of the measurement error in benefits is correctly estimated, and b) a researcher finds valid exclusion restrictions, in this case variables that affect the expected benefit amount but have no influence on take-up decisions apart from their indirect effects through benefit levels. Elder and Powers (2004) argue that this assumption

[14] Wu (2009) measures the correlation between the benefits level and the take-up decision, rather than the causal impact. The coefficient of the benefit level of Wu (2009) is fairly small, and falls within the broad range of the estimates in this paper using OLS models.

[15] Gundersen and Ziliak (2008) also include the elderly (60+) as one group in its analysis. Relying on longitudinal methods, they found that participation in SNAP is U-shaped across the life course, and food stamp participation is on average higher among those who have high levels of "permanent" income volatility.

[16] Cunnyngham (2010) uses a rich source of data to document state information on the characteristics of elderly SNAP participants, eligibles, and elderly participation rates and finds a wide variation in participation rates across states.

[17] There are some very recent variations in eligibility rules across states for the SNAP. In 2009, 13 states had exempted all or almost all households from the asset test, and all states exclude some or all vehicles from countable assets.

[18] Some work uses within-state over-time variation (for example, Neumark and Powers 2005), but then the estimated local average treatment effect is restricted to states that have changed their state SSI supplemental program over time, which may not be representative of all states.

is invalid for four variables used by McGarry: average household income in the previous year; household head status; marital status; and SSI generosity in the state of residence. As a result, the inherent selection issue that must be addressed before causal estimates can be measured – individuals who are in the program may be different from non-participating eligible individuals – is difficult to address. A recent study by Schmidt, Shore-Sheppard, and Watson (2013) uses simulated eligibility and benefits to instrument for imputed eligibility and potential benefits; however, their study focuses on families with children. Since proposals for raising SNAP/SSI benefit levels have been put forward to increase elderly participation, it is crucial to estimate the effects of public assistance benefits to the elderly participation decision.

Data, Sample, and Determining Program Eligibility

Data and Sample. For the primary analysis, we use data from the 1992 through 2010 waves of the *Health and Retirement Study* (HRS) linked to administrative earnings record and geographic identifiers. HRS is a longitudinal data collection effort begun in 1992 with a cohort of about 10,000 individuals between the ages 51 to 61 who were born between 1931 and 1941. Additional cohorts have been enrolled over time so that the survey includes 30,500 individuals in 2010 and can be weighted to be nationally representative of the population over the age of 50. Respondents are interviewed every two years.

Approximately 70 percent of respondents have given consent to have their Social Security earnings histories back to 1951 linked to the survey. For those who have not given permission, we estimate earnings histories based on survey data on previous jobs and wages (Gustman and Steinmeier 2001), using the estimated returns to tenure from Anderson, Gustman, and Steinmeier (1999).[19]

[19] To project earnings beyond the year at which the individual last gave permission to match to the administrative data, we again follow Gustman and Steinmeier (2001). For individuals with self-reported earnings, the assumption is that the average of their real earnings observed in the last three reported periods persist until their expected claiming date. The actual claiming age is used if respondents have already claimed Social Security benefits. For those yet to claim, we assume that respondents claim Social Security benefits at their self-reported expected retirement ages. If the expected retirement age was greater than 70, or if the individual indicated that he never expected to retire, a retirement age of 70 is used unless the individual had already worked beyond that age. If the respondent did not provide an expected retirement age, we assign them a claiming age so that the age distribution of claiming matches the Social Security reported claiming ages (U.S. Social Security Administration 2010, Table 6.B5.1). Combining the actual earnings with the simulated earnings yields a complete earnings profile for each individual in the HRS sample from 1951 to retirement age.

As discussed in the background section, states have the option of offering supplemental SSI benefits, and ignoring such state-level differences will cause substantial error in estimated benefits and eligibility. We match the public use data with the restricted-access geographic identifier file. The match rate is 99.7 percent.

In each wave, respondents are asked whether they have received SNAP/SSI at any time in the previous two years, and if so, the amount of their last SNAP/SSI benefit.[20] In addition to the self-reported recipiency status and benefits information, HRS data allow us to accurately determine eligibility and benefit levels for the SNAP and SSI programs: income, assets, living arrangements, state of residence, dependent, shelter, and medical expenditures, as well as other programs' participation status for the categorically eligible. These attributes of the HRS provide some important advantages over other nationally representative data sets that have been used to study take-up.[21] One draw-back of the HRS, however, is that income from certain sources is available only on an annual basis. Therefore, our analyses of SNAP/SSI take-up among eligible households use annual measures of eligibility and take-up.[22]

Our primary sample consists of survey respondents ages 50 to 80, whose household provided a family and financial respondent interview, who were not institutionalized at the time of the survey, who answered the SNAP/SSI receipt questions, and for whom we have an administrative earnings record or imputed earnings record. These restrictions result in a sample of 24,039 individuals and 130,518 person-year observations for the SNAP analysis, and 24,445 individual and 134,919 person-year observations for the SSI analysis.

The HRS provides imputations for many of the income and wealth questions, and we use these imputations whenever they are available. Imputations are not provided for the earnings and income of non-respondent co-residents for every wave, which is necessary to determine eligibility for the SNAP, so we impute these values using hot-deck methodology.[23] The unit of

[20] In 1992 respondents were asked about SNAP receipt in 1991 only.

[21] The *March Current Population Survey* (CPS) does not ask any questions about wealth, housing expenditures, or medical expenditures, nor does it rely on unfolding brackets for any of its income questions. The Survey of Income and Program Participation (SIPP) is fairly complete in its coverage of the factors determining eligibility. However, the quality of the wealth data in the SIPP is questionable (Gustman and Juster 1996) and the administrative earnings record linked to the SIPP is not readily accessible. Further, the longer panel structure of the HRS is essential in order to observe the transition into and out of the program around the early eligibility age.

[22] This inevitably introduces measurement problems. For example, a respondent in the HRS may be SNAP/SSI eligible for part of the previous year, yet correctly classified as "ineligible" on the basis of annual income.

[23] The detailed description of imputation method and the summary statistics are available from authors upon requests.

observation for all of our analysis is the individual. For household-level variables like income or wealth, the values represent the total income or wealth for the household in which an individual resides.

Determining SNAP and SSI Eligibility. We begin our analysis by calculating program eligibility and take-up rates among the eligible population. Since the determination of a unit's eligibility hinges on a number of assumptions and depends on the availability and accuracy of income and asset information, the classification is prone to error. As pointed out in previous studies, incorrectly classifying some individuals as eligible who are actually ineligible will result in a downwardly-biased computed take-up rate (Blank and Ruggles 1996, McGarry 1996, Daponte, Sanders, and Taylor 1999, Haider, Jacknowitz, and Schoeni 2003, Strand, Rupp, and Davies 2009). The rich financial information in the HRS and administrative earnings records allows us to assess eligibility more accurately by accounting for various deductions and the asset limit; we then compute the take-up rate among the eligible.[24,25]

We determine SNAP eligibility accounting for age/disability-specific gross and net income tests, the dependent, shelter, and medical expenditure deductions, categorical eligibility, and the age/disability-appropriate asset tests. Figure 1A summarizes the patterns of eligibility and take-up by age. Overall, about 10 percent of our sample is estimated to be eligible for the SNAP, which is comparable to the literature (Haider, Jacknowitz, and Schoeni 2003; Wu 2009). Eligibility increases with age: while about 8 percent of individuals under age 60 are eligible for SNAP, the rate for individuals over age 60 exceeds 10 percent. This is due to both differences in eligibility rules that are based on age and in the income/asset decline that occurs over the lifecycle. Not surprising, we also find that the take-up rate among the eligible elderly is low. Only 28 percent of the elderly who are eligible receive benefits. Consistent with the existing literature, we find a negative age gradient in take-up: while about 34 percent of eligible

[24] Appendix Tables A-1 and A-2 provide a detailed discussion of the information that is available in the HRS for assessing eligibility, as well as the assumptions made given its limitations.

[25] Typically, measurement error in self-reported earnings is negatively correlated with true earnings. However, we find that while people tend to underreport their earnings in general, those with low levels of earnings (those who are potentially eligible for SSI and SNAP) tend to over-report their earnings in the HRS. The average self-reported earnings are $35,235 annually, $1,143 lower than the average administrative earnings. About 20 percent over report earnings, and the over-reporting is concentrated on the bottom of the income distribution. This finding is consistent with Strand, Rupp, and Davies (2009) using the SIPP linked to administrative earnings records.

individuals age 60 and younger collects benefits, the proportion declines to 23 for those 70 and older.

We determine SSI eligibility by applying both the state-specific income and asset tests, and also by applying health tests to the population under age 65.[26] Figure 1B summarizes patterns of eligibility and participation among the eligible. We find that 4.6 percent of our sample is eligible for benefits and only 47 percent of the eligible population takes up the benefit.

Our analysis of SSI is also complicated by the fact that two distinct groups may enter the program: the aged and the disabled. At age 65, the disability standards are removed, and we observe an eligibility surge. In contrast to SNAP's negative age gradient for take up, the take-up rate for SSI is relatively higher for the older group compared to those under age 60.

Even if program eligibility could be assessed entirely without error, the calculated take-up rate would still be biased if respondents' reports of participation contain errors. To assess the extent of this problem, we calculate the participation rates of those individuals we classify as ineligible. We find that about 1.5 percent of people classified as not eligible for SNAP/SSI report that they received SNAP/SSI, which is consistent with the literature.[27] The literature also documents that the HRS has relatively lower under-reporting compared to other surveys (Haider, Jacknowitz, and Schoeni 2003). Finally, when we compare the demographic characteristics of recipients, the average calculated SNAP/SSI benefits in the HRS, and estimates of other quantities based on the HRS versus administrative records, we find that the HRS tracks the administrative data fairly well.[28] Overall, these results suggest that the HRS can be used to analyze determinants of SNAP/SSI eligibility and take-up among the elderly.

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[26] We determine someone is disabled if they answer that they have a work-limiting condition. While there is concern about the reliability of self-reported health and disability in survey datasets (e.g., Institute of Medicine, 2002), it remains a widely used proxy for disability. Benítez-Silva et al. (1999) isolate the problem of inferring disability status. Using an innovative approach that focuses on a subsample of applicants for federal disability benefits, they compare self-reports of work incapacity to the Social Security Administration's (SSA) award decision. Under the identifying assumption that the SSA's definition of disability forms the social standard for what constitutes work incapacity, they find that disability self-reports are unbiased. Since we are trying to identify disability as determined by SSA, we also use disability self-reports as a proxy.

[27] For instance, using the AHEAD cohort of the HRS, Haider, Jacknowitz, and Schoeni (2003) find that less than 1.5 percent of people classified as ineligible for SNAP report that they receive benefits.

[28] For selected waves, we compare characteristics of SNAP recipients in our sample with those reported in the SNAP Quality Control data and find that there are no statistically significant differences in race, gender, marital status, and education. We also compare characteristics of SSI in our sample with the SIPP matched to SSI administrative files (Table A-2 of Elder and Powers 2004), and find that our sample matches fairly well with the administrative record in terms of age, race, gender, marital status, and health status.

Does Social Security Impact Take-up by Changing the Composition of the Eligible Pool?

Social Security can impact the take-up of means-tested programs in two ways. First, by providing a considerable amount of income, Social Security changes who is eligible for means-tested transfer programs. In 2011, Social Security lifted over 14.5 million elderly Americans above the poverty line, which directly made some individuals ineligible for the means-tested programs and compresses the bottom of the income distribution (Van de Water and Sherman 2012). Since around 40 percent of Americans claim Social Security within one year of turning 62, which is Social Security's Early Eligibility Age (EEA) (Bosworth and Burtless 2010), and since our sample indicates that about 62 percent claimed between 62 and 63, it is not surprising to see the eligibility rate drop at this age for both SNAP (Figure 1A) and SSI (Figure 1B) programs.

Second, among those who are still eligible, Social Security income can impact take-up by increasing their income relative to the poverty line, thus decreasing the potential public assistance benefit level and the marginal utility of the additional income.[29] Figures 2A and 2B illustrate that among eligible households, the income distribution shifts upwards after age 62. Among the SNAP-eligible population, Figure 2A shows that, at the 25th percentile of the income distribution when SSI and SNAP benefits are excluded, total family income is around 58 percent of the poverty threshold at ages 61-62; it jumps to 70 percent for ages 63-64. Figure 2B shows sharp drops in SNAP benefits level around age 62 (the EEA), particularly for those at the bottom of the benefit distribution. Similar patterns are observed for the SSI program (Figures 3A and 3B). When following the same individual over time, we also find that the likelihood of being eligible declines around the EEA. Therefore, Social Security, by lifting elderly individuals above the poverty line, changes the pool of eligible individuals.

If the likelihood of take-up varies among individuals, Social Security could impact the take-up rate simply by changing the composition of the eligible pool. These changes are largely overlooked in the take-up literature. Tables 1A and 1B explore the take-up rates and benefit amounts, by age, based on eligibility before and after age 62. Surprisingly, we find little evidence of differential take-up, on average, among these groups: eligible individuals who

[29] While it is well known that Social Security's replacement rate is less than one (80 to 90 percent for low-wage earners on average), the replacement rate is computed based on annualized lifetime income, not as a fraction of income in the years just prior to claiming benefits. As such, many low-income households – especially individuals who are widowed or not working – experience an increase in income due to claiming retirement benefits.

become ineligible after they turn age 62 and ineligible individuals who become eligible after 62. For SNAP, the take-up rate is 8 percent for both groups; for SSI, the average SSI benefit is lower for those newly eligible after 62, which likely explains the slight difference that we do find (13 percent vs. 9 percent, a difference that is statistically insignificant). Not surprisingly, the take-up rate is higher among individuals who have longer eligibility spells; for instance, among those who are eligible for SSI both before and after the EEA, about 58 percent took up the benefits before age 62, and 62 percent took up after age 62. Interestingly, we also find that SNAP/SSI recipients who remain eligible for SNAP/SSI after receiving Social Security are more likely to exit from in-kind transfer programs (SNAP) compared to the cash transfer program (SSI) (32 percent vs. 9 percent).

Empirical Strategy

Conceptual Framework. We start with McGarry's (1996) framework, which relates the net cost of enrolling in means-tested programs to the expected benefits and other variables thought to influence expected public assistance benefits and costs of enrolling. In particular, an eligible individual participates in SNAP/SSI if the utility gain from participating, P_{it}^*, is positive. One only observes the final participation decision, P_{it}, where $P_{it} = 1$ if $P_{it}^* > 0$, and $P_{it} = 0$ otherwise. In the estimation, P_{it}^* will be modeled as a linear function of the potential benefits of participating, as well as a function of individual socioeconomic characteristics. That is,

$$P_{it}^* = \propto B_{it} + X_{it}^{'}\beta + \varepsilon_{it} \quad \textbf{(1)}$$

where ε_{it} is distributed normally with mean 0 and variance σ_e^2, B_{it} is the monetary public assistance benefit associated with participating, and X_{it} is the individual characteristic thought to affect preferences for participation, such as age, race, gender, marital status, education, household size, health status, and asset ownership.

Tables 2A and 2B present descriptive information for our analytic sample – eligible elderly individuals – for the SNAP and SSI programs, respectively, by participation status and

by age.[30] At any age, participants are more likely to be female or minorities and less likely to be married, and they have somewhat less schooling. On average, the participants are poorer and less likely to own a home or a car; they also seem more likely to have a higher level of expected public assistance benefits – for instance, the mean calculated SSI benefit for participants is $366, compared to $279 for nonparticipants; and they are much more likely to receive benefits from other welfare programs.

Instrumental Variable Construction. To estimate how benefit levels from public assistance programs impact the likelihood of take-up among the eligible, we estimate a two-stage model. We exploit the exogenous variation in potential public assistance benefits caused by Social Security receipt in order to estimate the causal relationship between public assistance benefit levels and the take-up decision among eligible individuals in means-tested programs. We develop an instrumental variable, the Average Potential Benefit, to capture the variation in the programs' expected benefit levels upon potentially receiving Social Security retirement benefits at the EEA. This instrument will vary not just as someone ages (reaching the EEA). It will also vary among individuals, based on their demographic characteristics, though not their work histories.

Before age 62, the Average Potential Benefit is set at the maximum benefit level under the SNAP and SSI programs, by household size and state of residence. At age 62 and above, the Average Potential Benefit equals the maximum SNAP or SSI benefits level, minus the Social Security retirement benefit an individual claiming at 62 would have, averaged over demographic cell. The demographic cell is constructed by 5-year age groups, gender, race, education, and marital status; this approach is in the spirit of that used by Currie and Gruber (1996) in the context of Medicaid, and that used by Schmidt, Shore-Sheppard, and Watson (2013) to study five major safety net programs.

The validity of this instrument relies on the fact that Social Security benefits are the backbone of most people's retirement income and that it reduces SNAP/SSI payments on nearly a dollar for-dollar basis. An examination of the income data of individuals further supports this approach. For instance, 27 percent of self-reported SNAP recipients in the sample who are age

[30] For the regression analysis, we exclude individuals who receive SSDI, because they are automatically converted to retirement benefits at their FRA, and thus will not be impacted by the Social Security EEA.

62 and older, and 37 percent of SSI recipients 62 and older in our sample list Social Security as their sole income source; and for over 40 percent of SNAP recipients and 50 percent of SSI recipients, Social Security retirement income accounts for 90 percent or more of their total income. This indicates there should be a high correlation between actual SNAP/SSI benefits one would receive and the Average Potential Benefits measure. Moreover, after claiming, the Social Security benefits are largely fixed from the individual's perspective.[31] By construction, this variable reveals the exogenous decline in the SNAP/SSI benefits levels upon claiming Social Security.

Further, the average Social Security benefit, by demographic cell, has advantages over individual specific benefit levels based on earnings history and marital status. Because a "taste for work" is difficult to measure but is likely correlated with both earnings history (and thus Social Security benefits) and one's likelihood of participating in a means-tested program. Using individual-level variation, especially the variation related to the preference for work, may raise concerns about the validity of the instrumental variable. On the other hand, the average Social Security benefit at age 62, by demographic cell, is correlated with individual benefit levels but should not be correlated with individual-level unobserved characteristics, such as family shocks or a taste for work and welfare, conditional on the other variables. Further, we do not use earned income to define cells because labor market decisions are likely endogenous to safety net parameters.[32]

Administrative earnings records are necessary to calculate this instrumental variable, because we can include individuals over age 62 who have not yet claimed Social Security benefits and individuals missing claiming ages or self-reported benefits levels in the analysis, thus not introducing selection in the process of addressing endogeneity. Also, the self-reported benefit level and claiming age may contain measurement error, potentially biasing the calculated of the Average Potential Benefit and, in turn, the estimates of the impact of potential benefit levels on the take-up decision. Further, measurement error in the calculated benefits may bias the estimation (McGarry 1996; Davies 2002; Elder and Powers 2004), and the two-stage-least-square procedure helps obtain a consistent estimate of the effect of the benefit on participation by

[31] Social Security will recalculate the Primary Insurance Amount as long as the individual keeps working, but under most circumstances, this recalculation leads to modest increases in benefits. Delaying claiming is the primary way to influence retirement benefits after age 60.

[32] The average cell size is 36 for the SSI analytical sample, with a standard deviation of 22; the average cell size is 69 for the SNAP sample, with a standard deviation of 34.

minimizing the impact of measurement error in the calculated benefit (McGarry 1996). After we estimate the Social Security benefit level at individual level assuming he claims at age 62, we aggregate the estimation to the demographic cell level to construct the cell average.

Empirical Specifications: We start by estimating the linear probability model among eligible individuals as follows:

$$P_{it} = \beta_0 + \beta_1 B_{it} + X_{it}^{'}\gamma + \tau_t + \varepsilon_{it} \qquad \textbf{(2)}$$

where P_{it} is a binary variable equal to 1 if participating at time t and 0 if not. B_{it} is the expected benefit level in each of the means-tested programs examined for eligible individual i at time t.[33] Since the amount of expected public assistance benefits is observed only for those who actually participate, we calculate the expected SSI/SNAP benefit level for each eligible individual based on survey information and the rules of each program. Variables such as race, education, gender, marital status, family structure, disability indicators to proxy for permanent income, and total covered quarters worked are included in X.[34] τ_t are year of interview dummies, and ε_{it} denotes an idiosyncratic error term. The coefficient of interest is $\beta_{1,}$ which measures the association between the expected public assistance benefit level and likelihood of take-up.

In some models, we exploit the longitudinal nature of the data set and include individual fixed effects in order to capture time-invariant unobservable characteristics that might be correlated with the participation decision. The specification takes the following form:

$$P_{it} = \beta_0 + \beta_1 B_{it} + X_{it}^{'}\gamma + \tau_t + \alpha_i + \varepsilon_{it} \qquad \textbf{(3)}$$

where α_i is the unobserved time-invariant individual effect.

To examine the causal relationship between expected benefits level and take-up behavior, we estimate a Two Stage Least Squares (TSLS) model with the Average Potential Benefit as the instrumental variable. While the individual fixed effect model takes into account time-invariant

[33] Benefits use average monthly measure based on the annual information.
[34] Using demographic variables to capture permanent income makes this work comparable to the program participation literature.

individual unobservable heterogeneity**,** the IV model has the advantages of accounting for time variant unobservables and for measurement error in the expected benefits level.

The first stage estimates the effect of the Average Potential Benefit on the needs-based program benefit level:

$$B_{it} = \alpha_0 + \alpha_1 AvePotBen_{it} + X_{it}^{'}\psi + \tau_t + \varepsilon_{it} \quad \textbf{(4)}$$

where *AvePotBen* is the instrumental variable.

Instead of estimating the effect of actual public assistance benefit levels on participation, the predicted public assistance benefit level from the first equation will be used when estimating the participation equation:

$$P_{it} = \beta_0 + \beta_1 \hat{B}_{it} + X_{it}^{'}\gamma + \tau_t + \varepsilon_{it} \quad \textbf{(5)}$$

where the coefficient of interest is $\beta_{1,}$ which measures the causal impact of the expected public assistance benefit level on the take-up behavior.

While receiving Social Security benefits leads to a decline in the benefit level, it may also impact ones knowledge about the SSI program, since SSI is also operated by the Social Security Administration.[35] The improved information about program eligibility may negate the effect of a benefit change on participation. A lack of information contributes to nonparticipation among the elderly (Coe 1983, Blaylock and Smallwood 1984, Hill 1990, Daponte, Sanders, and Taylor 1999, Wu 2009), and receiving information on program eligibility may lead to a higher taking up rate. Ideally, one would measure knowledge of SNAP/SSI directly using data individual perceptions of these programs. Lacking such data, we follow the example of recent literature that exploits geographical heterogeneity as a proxy for knowledge of the Earned Income Tax Credit or disability programs (Furtado and Theodoropoulos 2012, Chetty, Friedman, and Saez 2012). To proxy for knowledge, we include poverty density, by zip code, as a control in our

[35] When individuals claim early retirement benefits. they may learn that they are also eligible for SSI benefits (Social Security Administration, 2010). Thus, at the same time as being eligible for fewer benefits, they also learn of their eligibility status.

model, with the intention of capturing word-of-mouth communication.[36] Living in a zip code with a higher fraction of the population below poverty may lead to improved information about public assistance programs. Social interaction with members of one's community helps to convey information about program eligibility and the application process that may make it easier to apply for SNAP and SSI.

We present the participation estimates in Tables 3A and 3B. The results for a simple OLS model (Model 1, estimating equation 2), an individual fixed-effects model (Model 2, estimating equation 3), and an IV model (Model 3, estimating equation 4 and 5) are shown. The regression sample is smaller than the sample of all eligibles used for Table 2 due to the construction of Average Potential Benefits (*AvePotBen)*; observations that have negative values for *AvePotBen* are excluded from the analysis.[37] The bottom panels of Tables 3A and 3B report the coefficients of the instrumental variables from the first stage.

For SNAP participation, the OLS yields different results from the FE and the IV models (Table 3A). In the OLS model, the effects of most of the variables assumed to influence the participation decision operate in directions consistent with the literature that estimates the correlation between SNAP use and personal characteristics. These estimates clearly show that SNAP take-up is strongly associated with economic incentives. A higher expected monetary SNAP benefit increases the probability of participation, though the coefficient is significant only at the 10 percent level and the magnitude is fairly small. Even after controlling for the size of their expected SNAP benefits, elderly individuals who own a home or car are less likely to participate, as are the better-educated, those without children under 15 in the household, and those in good or fair health condition. Consistent with the literature, we find a negative age gradient in the participation decision. Individuals who have higher numbers of covered quarters also are less likely to participate. Further, we find that those receiving SSI are significantly more likely to participation in SNAP, suggesting the possible effects of better information, lower application costs, and/or a lower welfare stigma once one a means-tested program is utilized. Interestingly, there is no remaining correlation between zip-code poverty density and SNAP participation.

[36] Previous research has found neighborhood effects in outcomes such as educational achievement, dropout rates, transition from welfare to work, social and occupational mobility, health, subjective well-being, and stock ownership (Ellen and Turner 1997; Galster 2002; Dietz 2002; Durlauf 2004, Brown et al. 2008).

[37] To test whether sample selection drives any different results, we have also estimated the OLS model using the full sample. The estimates are largely consistent. The full results are available from authors upon request.

The OLS model suggests that for every $100 in SNAP benefits, participation increases by about 1.3 percentage points. Turning to Model 2, we add individual fixed-effects to the OLS model to take into account time-invariant individual unobservable heterogeneity that affects the take-up decision. The expected SNAP benefits lose significance in the fixed-effects model, and the magnitude is roughly half of that estimated in the OLS model. Some of the coefficients that are significant in a cross-sectional setting are not significant in the fixed-effects model, such as home ownership and having kids under 15. The lack of significance could be due to fact that the fixed-effects are soaking up much of the variation at the individual-level, leading to imprecise estimates.[38]

Turning to Model 3 (IV), the first stage results show that the instrument tends to have the expected sign and is statistically significant (F=88); that is, the Average Potential Benefit is positively correlated with the level of SNAP benefits. However, we find in the second stage that there is no significant relationship between the SNAP benefit amount and take-up, indicating that individuals whose benefit levels are impacted by Social Security income are insensitive to expected public assistance benefits. Interestingly, the estimated coefficient, while imprecisely estimated, is larger than the OLS coefficient. This suggests that classical measurement error is confounding the OLS relationship more than the traditional selection issues.[39,40]

Turning to the SSI take-up decision (Table 3B), we add an additional control variable — age 65 and over – to capture the removal of the disability test for eligibility. The results for the SSI program are broadly consistent across the model specifications. A higher expected SSI monetary benefit increases the probability of participation. Elderly individuals who own a home or car are less likely to participate, as are the better-educated, and those with longer work histories. Individuals receiving other welfare benefits are also more likely to participate. Unlike the SNAP model where we find a negative correlation between age and SNAP take-up, age is positively associated with the probability of SSI take-up, especially for those 65 and older, suggesting the role of differential eligibility. Similar to the SNAP analysis, there is no remaining correlation between zip-code poverty density and SSI participation.

[38] The fixed effects in an instrumental variables model also soak up much of the variation and lead to insignificant results, which are not reported here.

[39] On the one hand, correcting for the positive bias of the OLS due to endogeneity concerns leads to smaller instrumental variable estimates. On the other hand, the instrumental variable estimates may be larger than the OLS estimates due to the presence of classical measurement error (e.g., Hyslop and Imbens 2001).

[40] Partially due to relatively large estimated standard errors in the three SNAP take-up models, we cannot reject the null that all three models estimate the same relationship between SNAP benefits and the take-up decision.

The OLS model suggests that for every $100 increase in SSI benefits, participation increases by 4.3 percentage points. Once we add individual fixed-effects to the OLS model (Model 2), the estimate decreases slightly, to 3.0 percentage points. Either model suggests that individuals are more sensitive to benefit amounts for SSI's cash benefits than for SNAP's in-kind benefits.

Turning to Model 3 (IV), the first stage results show that the instrument – the Average Potential Benefit – is highly positively correlated to the level of calculated SSI benefits (F=62). In the second stage, there is a significant relationship between SSI benefits amount and take-up. When comparing the OLS and IV results, the magnitude of the estimated effect of SSI benefits on participation is slightly increased, 0.043 vs. 0.060, again suggesting that classical measurement error is confounding the OLS estimate even more than selection concerns. The IV results suggest that for individuals whose SSI benefit increases by $100, participation increases by 6 percentage points. The average SSI benefit drops from $472 to $229 around the EEA, suggesting that Social Security benefits decrease SSI participation by about 15 percentage points due to the decrease in benefit level.

In a set of model specification tests, we also include eligibility status in the previous wave as a control variable, in order to test the hypothesis that individuals who have longer eligibility spells are more likely to participate, possibly due to the information about the program or/and their persistent poverty status. The lagged variable is statistically significant and an important predictor of take up (for SNAP, in the OLS, the coefficient is equal to 0.122; the t statistic is equal to 8.83; for SSI, the coefficient is 0.265; the t statistic=17.90). However, the estimated effect of the relationship between benefit level and take up remains largely unchanged with those presented in Tables 3A and 3B. To test for a non-linear relationship between benefit levels and participation we add a square-term of benefit level in regressions. In all specifications we find that the square-term is insignificant and small in magnitude, and the main results are largely similar across various specifications compared to those without square-term.

Taken together, our estimates are inconclusive about the behavioral response to changes in SNAP benefits, but a $100 increase in SSI benefits leads to a four to six percentage point increase in the probability of participating in the SSI.

Sensitivity Tests

In this section, we test the robustness of our findings in three ways: 1) relaxing the asset eligibility requirement in our eligibility definition; 2) estimating the take-up equations among those with income less than 130 percent of the poverty line for SNAP program; 3) estimating the take-up equation among eligible individuals age 65 and older for whom the disability test is removed for SSI program.

Relaxing the Asset and Resource Eligibility Requirements. The literature suggests that households tend to under-report asset holdings (Czajka et al. 2003, for example), but the under-reporting is less a concern for the study of the low-income and elderly populations in general (Strand, Rupp, and Davies 2009). Nevertheless, we examine how robust our results are when relaxing the asset eligibility requirement.

Not surprisingly, the eligibility rate for SNAP increases to 16 percent when relaxing the asset tests, and the take-up rate declines to 19 percent. A similar pattern is observed for SSI, with eligibility rate rising to 8.6 percent and take-up declining to 31 percent.

The results of estimating the take-up equation among these new eligible samples are summarized in Table 4. For SNAP, again, while there is a statistically significant relationship in the OLS model, we find that individuals are insensitive to changes in the expected benefits level in the instrumental variable estimations and the fixed-effects estimations. For SSI, the broad conclusions are the same, but the magnitude of the effect increases (0.075).

Using 130 Percent of the Poverty Line to Determine Eligibility for SNAP. To address concern about measurement error in other income components or expenditures that we used to calculate various deductions, we also estimate the take-up equation for SNAP among individuals whose household income is under 130 percent of the poverty line (using only the gross income test).

In this analysis, our eligibility rate increases to 13 percent with a take-up of 24 percent. Again, while the OLS estimate on expected SNAP benefits is significant, the instrumental variable estimate and the fixed-effects estimate lose their significance (Table 4).

Estimate Take-up Equations Among Those Over Age 65 for SSI. As discussed before, the SSI analysis is complicated by the fact that two distinct groups may enter the program – the aged and the disabled. Since the disability standards are removed at age 65, we observe an eligibility surge. Additionally, while the work-limitation measure is not a perfect representation of the Social Security Administration's disability criteria, our disability eligibility for individuals under 65 may be noisy. For these reasons, we estimate a separate take-up equation among eligibles age 65 and older for whom the disability test is removed for the SSI program.

The broad conclusions are the same regardless of the estimation model (Table 4). When comparing the OLS and instrumental variable results, however, the change in the estimated effect of SSI benefits on participation is relative substantial, increasing from 0.044 to 0.128. The instrumental variable results suggest that for older individuals whose SSI benefit increases by $100, participation increases by 13 percentage points.

Conclusion

By providing income to elderly households, Social Security potentially influences the take-up of means-tested programs among the elderly in two distinct ways. First, by lifting households out of poverty, the composition of the pool of eligible individuals changes. To the extent that there is heterogeneity in individual take-up decisions, changing the eligible pool could help explain the difference in take-up rates. However, we find very little support for this theory. While individuals who are serially-eligible have higher take-up rates, there is no differential average take up among those who become eligible versus those who become ineligible as they become old enough to claim Social Security benefits.

Second, Social Security could influence take-up decisions by providing income and decreasing the expected public assistance benefit level one may claim, thus decreasing the benefit of participation. While our estimates are inconclusive about the behavior response to the benefit change of the SNAP, we estimate that a $100 increase in SSI benefits leads to a 4-6-percentage-point increase in the probability of participating in the SSI. These results are robust to numerous model specifications.

Further, our data and methodology have advantages over many existing studies: using administrative earnings rather than self-reported ones improves the measurement of one component of income used in computing SNAP/SSI eligibility. The instrumental variable

approach and sensitivity tests using different definitions of the eligible population help to address the measurement error in the potential means-tested benefit level, further confirming that our findings are robust.

Finally, by examining two programs – SSI and SNAP – in consistent ways, we can compare the estimated relationship between the expected public assistance benefits level on the take-up decision with little worry that the model assumptions are driving differences in the results. By comparing these two programs, we find two pieces of suggestive evidence that indicate individuals prefer cash to in-kind transfers. First, take-up in SSI is more sensitive than SNAP to the expected public assistance benefit level, and second, after receiving Social Security benefits, eligible individuals remain on SSI more often than they maintain their SNAP benefits.

The policy implications of these results are straightforward. Our estimates suggest that a 10-15 percentage point decrease in SSI take-up among the elderly can be explained by the lower benefit levels. The different behavioral response to SSI and SNAP also suggest that effective policy interventions should take into account the type of benefits – cash or in-kind – when targeting poverty relief for the elderly.

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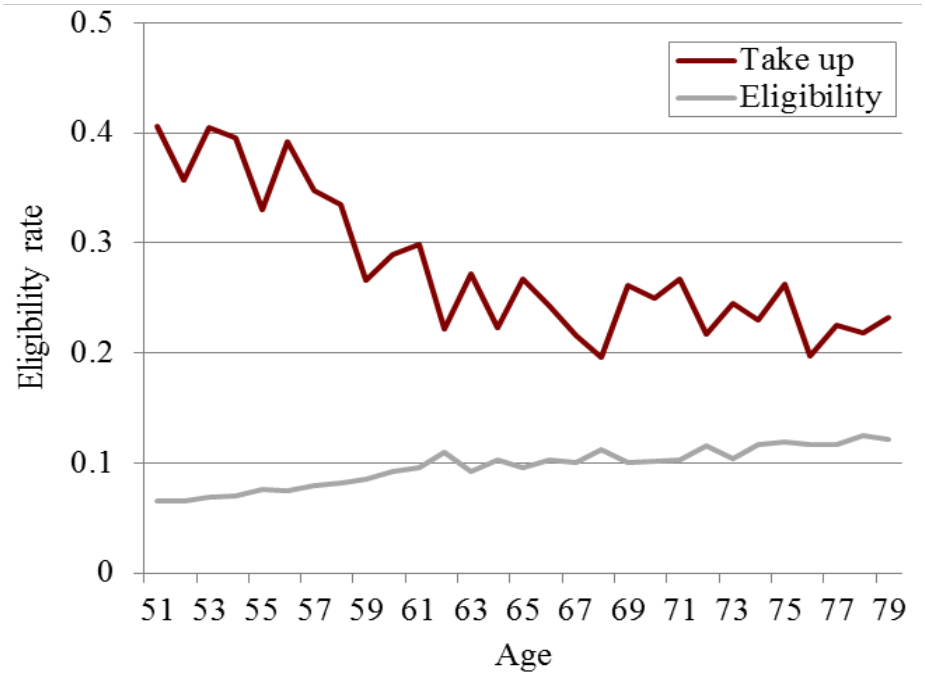
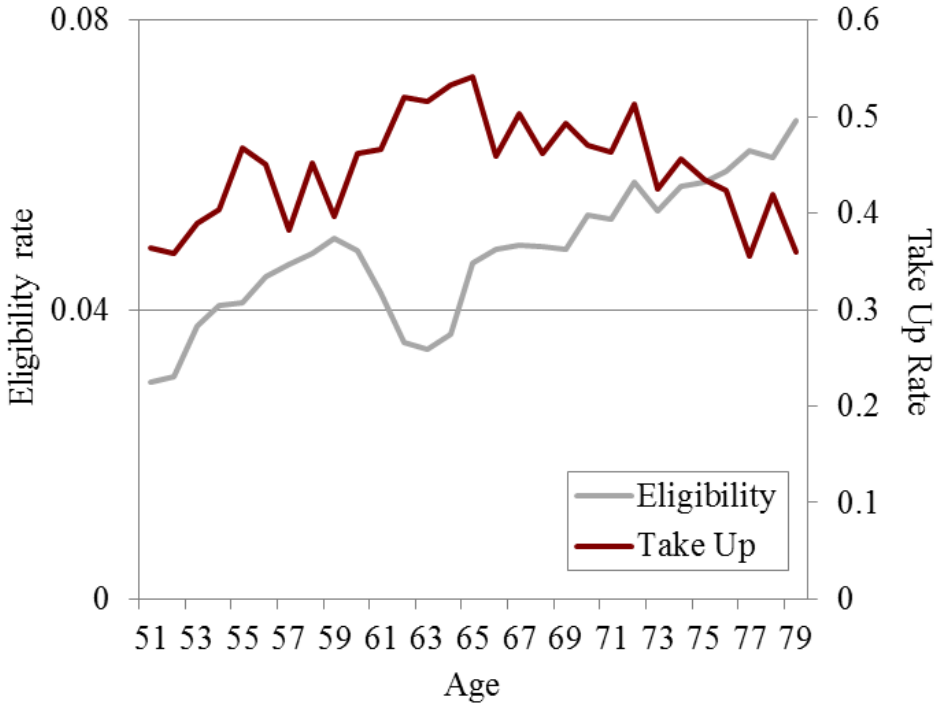
Figure 1A. *SNAP Eligibility and Take-up Rates by Age*



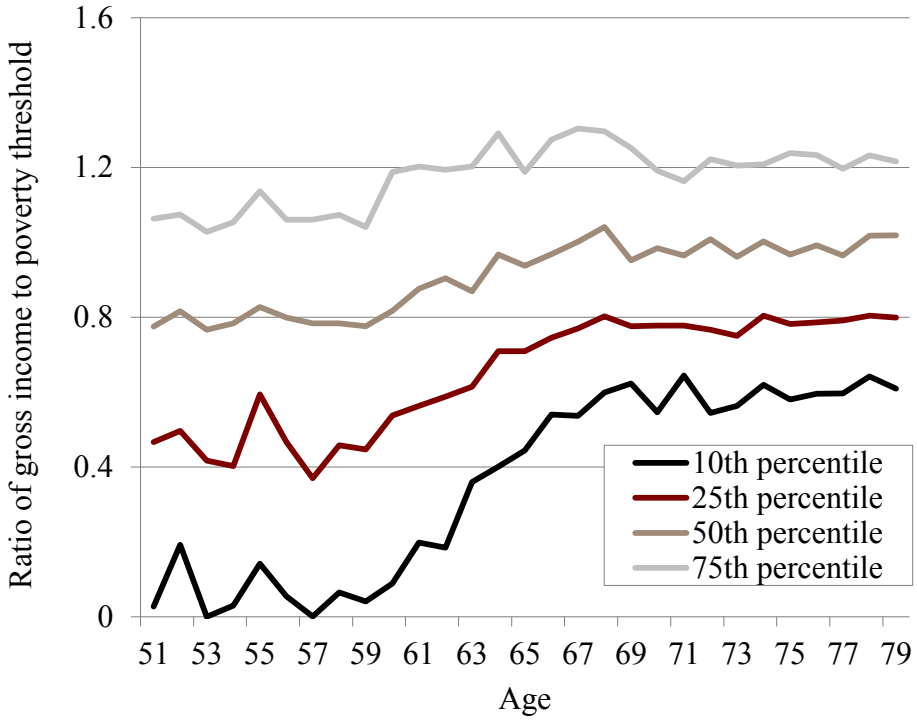
Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Figure 1B. *SSI Eligibility and Take-up Rates by Age*



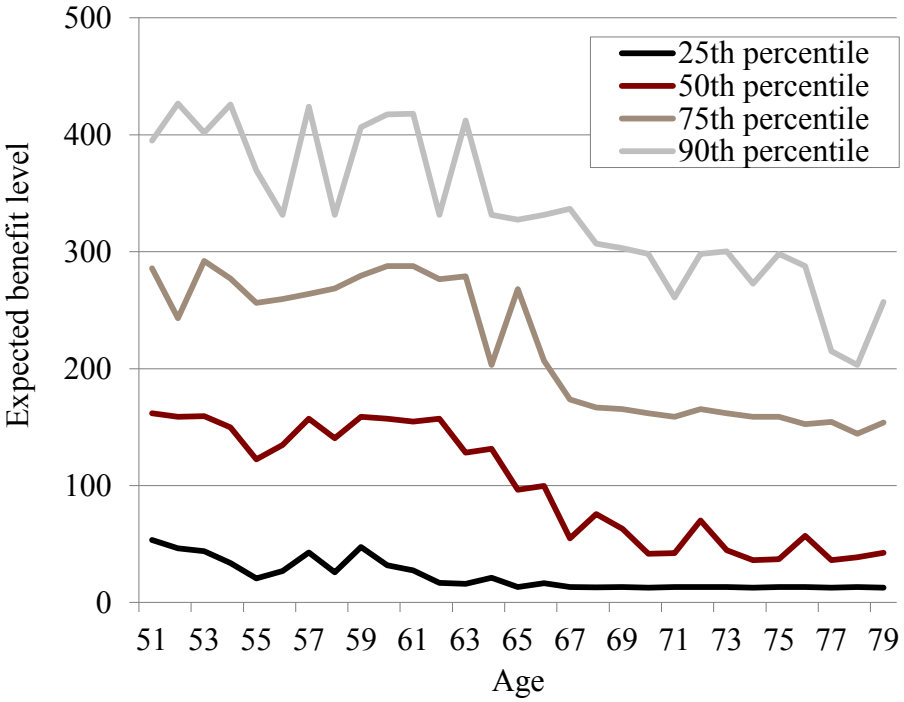
Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Figure 2A. *Ratio of Gross Income to Poverty Threshold by Age among SNAP Eligible Respondents*



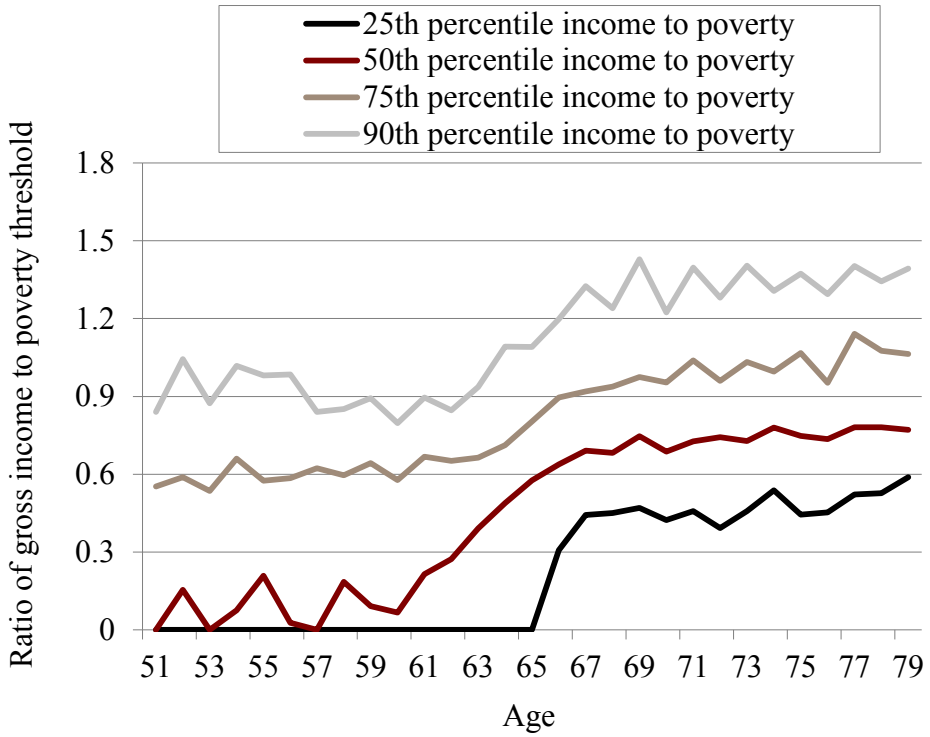
Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Figure 2B. *Expected SNAP Benefit Level by Age among SNAP Eligible Respondents*



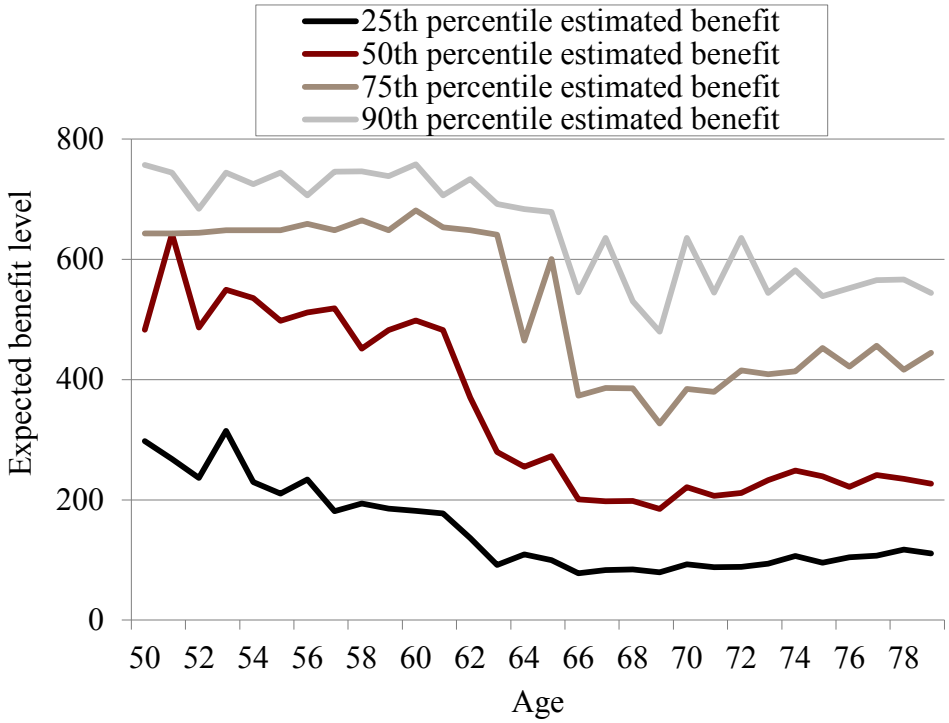
Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Figure 3A. *Ratio of Gross Income to Poverty Threshold by Age among SSI Eligible Respondents*



Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Figure 3B. *Expected SSI Benefit Level by Age among SSI Eligible Respondents*



Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Table 1A. *Take-up Rate by Eligibility Status, SNAP Program*

	Take-up rate		Number of observations		Estimated benefit (per month)	
	Age 58-61	Age 62-64	Age 58-61	Age 62-64	Age 58-61	Age 62-64
Eligible both periods	0.38	0.32	547	504	$188	$161
Eligible first period, ineligible second period	0.08	N/A	376	N/A	$195	N/A
Ineligible first period, eligible second period	N/A	0.08	N/A	472	N/A	$189

Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Table 1B. *Take-up Rate by Eligibility Status, SSI Program*

	Take-up rate		Number of observations		Estimated benefit (per month)	
	Age 58-61	Age 62-64	Age 58-61	Age 62-64	Age 58-61	Age 62-64
Eligible both periods	0.57	0.64	617	514	$421	$360
Eligible first period, ineligible second period	0.13	N/A	887	N/A	$165	N/A
Ineligible first period, eligible second period	N/A	0.09	N/A	482	N/A	$109

Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Table 2A. *Summary Statistics for SNAP Eligibles*

	Pre-ERA				ERA and older			
	Eligible, take up		Eligible, no take up		Eligible, take up		Eligible, no take up	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Age	56.26	3.10	56.74	3.09	71.10	5.00	70.84	5.14
Female	0.62	0.49	0.56	0.50	0.74	0.44	0.65	0.48
White	0.54	0.50	0.66	0.48	0.64	0.48	0.69	0.46
Married	0.31	0.46	0.44	0.50	0.22	0.41	0.37	0.48
Less than high school degree	0.42	0.49	0.56	0.50	0.33	0.47	0.44	0.50
Household size								
One person household (%)	0.36	0.48	0.34	0.48	0.56	0.50	0.48	0.50
Mean	2.45	1.71	2.35	1.54	1.72	1.17	1.81	1.10
Income to poverty	0.64	0.43	0.82	0.75	0.83	0.33	1.15	0.74
Own a home	0.34	0.47	0.54	0.50	0.36	0.48	0.58	0.49
Own a car	0.46	0.50	0.66	0.47	0.37	0.48	0.59	0.49
Receive SSI	0.28	0.45	0.08	0.27	0.49	0.50	0.16	0.37
Poor health	0.29	0.45	0.18	0.38	0.28	0.45	0.19	0.39
Mean estimated SNAP benefit	212.10	187.88	205.21	177.35	108.43	132.19	123.25	140.25
Ever previously eligible	0.54	0.50	0.36	0.48	0.84	2.38	1.24	3.21
Quarters of work	79.46	52.56	102.35	53.55	0.76	0.43	0.55	0.50
Mean % zipcode below 130% of poverty	0.33	0.47	0.23	0.42	68.32	52.69	90.89	57.38
Number of observations	850		1,869		1,456		5,162	

Note: Data on benefits are expressed in 2011 dollars using CPI-U.
Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Table 2B. *Summary Statistics for SSI Eligibles*

	Pre-ERA				ERA and Older			
	Eligible, take up		Eligible, no take up		Eligible, take up		Eligible, no take up	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Age	56.94	2.86	56.63	2.98	71.25	4.81	71.88	4.88
Female	0.71	0.45	0.58	0.49	0.75	0.43	0.77	0.42
White	0.59	0.49	0.61	0.49	0.61	0.49	0.66	0.47
Married	0.11	0.31	0.23	0.42	0.22	0.42	0.28	0.45
Less than high school degree	0.66	0.47	0.50	0.50	0.73	0.44	0.63	0.48
Household size								
One person household (%)	0.46	0.50	0.25	0.43	0.45	0.50	0.43	0.50
Mean	2.26	1.60	2.63	1.69	2.19	1.64	2.23	1.64
Income to Poverty	0.04	0.21	0.44	0.68	0.48	0.43	0.91	0.56
Own a home	0.26	0.44	0.34	0.47	0.32	0.47	0.53	0.50
Own a car	0.29	0.45	0.49	0.50	0.29	0.45	0.47	0.50
Receive welfare	0.58	0.49	0.37	0.48	0.48	0.50	0.23	0.42
Poor health	0.49	0.50	0.42	0.49	0.28	0.45	0.21	0.41
Mean estimated SSI benefit	642.58	150.25	461.39	240.01	337.64	240.06	236.49	198.64
Ever previously eligible	0.66	0.47	0.39	0.49	0.76	0.43	0.58	0.49
Quarters of work	46.41	41.95	92.68	51.63	53.85	47.87	61.91	48.69
Mean % zipcode below 130% of poverty	0.33	0.47	0.31	0.46	0.24	0.43	0.21	0.40
Number of observations	422		907		1,452		1,805	

Note: Data on benefits are expressed in 2011 dollars using CPI-U.
Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Table 3A. *SNAP Participation among the Eligible Elderly*

	Model (1)	Model (2)	Model (3)
	OLS	FE	IV
Estimated SNAP benefit ($00s)	0.013 *	0.008	0.052
	(0.007)	(0.006)	(0.033)
Age	-0.025 *	0.051 *	-0.026 *
	(0.014)	(0.029)	(0.014)
Age square	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Female	0.008		0.007
	(0.017)		(0.017)
Married	-0.028	0.010	0.004
	(0.018)	(0.027)	(0.030)
White	-0.018		-0.015
	(0.017)		(0.017)
High school and above	-0.026 *		-0.027 *
	(0.016)		(0.016)
Household size	-0.001	0.004	-0.024
	(0.008)	(0.008)	(0.019)
Children under 15	0.079 ***	0.035	0.079 ***
	(0.027)	(0.026)	(0.027)
Poor health	0.041 **	0.028 *	0.039 **
	(0.017)	(0.015)	(0.017)
Own a home	-0.086 ***	-0.020	-0.088 ***
	(0.017)	(0.021)	(0.017)
Own a car	-0.050 ***	0.041 **	-0.047 ***
	(0.016)	(0.016)	(0.016)
Receive SSI	0.265 ***	0.095 ***	0.277 ***
	(0.020)	(0.018)	(0.022)
Quarters worked	-0.001 ***		-0.001 ***
	(0.000)		(0.000)
Poverty density by zip-code	0.012	-0.006	0.007
	(0.017)	(0.016)	(0.018)
Wave indicator	Yes	Yes	Yes
State indicator	Yes	Yes	Yes
IV (Average Potential Benefits)			0.345 ***
			(0.037)
F-test of excluded inst.			88
R square	0.196	0.031	0.189
Number of observations	8,797	8,797	8,797

Note: * indicates significant at 10% confidence level; ** indicates significant at 5% level; *** indicates significant at 1% level.

Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Table 3B. *SSI Participation among the Eligible Elderly*

	Model (1)	Model (2)	Model (3)
	OLS	FE	IV
Estimated SSI benefit ($00s)	0.043 ***	0.030 ***	0.060 **
	(0.006)	(0.004)	(0.027)
Age	0.088 ***	0.174 ***	0.086 ***
	(0.020)	(0.043)	(0.020)
Age square	-0.001 ***	-0.001 ***	-0.001 ***
	(0.000)	(0.000)	(0.000)
65 plus	0.069 ***	0.113 ***	0.092
	(0.022)	(0.032)	(0.042)
Female	-0.022		-0.013
	(0.027)		(0.036)
Married	-0.013	0.002	0.011
	(0.027)	(0.050)	(0.046)
White	0.019		0.020
	(0.020)		(0.020)
High school and above	-0.041 *		-0.043 **
	(0.023)		(0.022)
Household size	-0.021	-0.009	-0.022 *
	(0.013)	(0.008)	(0.013)
Children under 15	-0.001	0.045 *	0.002
	(0.044)	(0.030)	(0.044)
Poor health	0.001	-0.055 **	-0.001
	(0.018)	(0.020)	(0.016)
Own a home	-0.069 ***	0.050	-0.066 ***
	(0.021)	(0.035)	(0.021)
Own a car	-0.054 *	0.005	-0.050
	(0.029)	(0.026)	(0.031)
Receive SNAP	0.184 ***	0.026 *	0.178 ***
	(0.022)	(0.020)	(0.025)
Quarters worked	-0.001 ***		-0.001 *
	(0.000)		(0.000)
Poverty density by zip-code	-0.020	0.027	-0.025
	(0.020)	(0.023)	(0.023)
Wave indicator	Yes	Yes	Yes
State indicator	Yes	Yes	Yes
IV (Average Potential Benefits)			0.201 ***
			(0.024)
F-test of excluded inst.			62
R square	0.222	0.114	0.217
Number of observations	3,923	3,923	3,923

Note: * indicates significant at 10% confidence level; ** indicates significant at 5% level; *** indicates significant at 1% level.

Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Table 4. *Sensitivity Tests*

	Model (1) OLS		Model (2) FE		Model (3) IV	
Relaxing the Asset Eligibility Requirement						
Estimated SNAP benefit ($00s)	0.027	***	0.009	*	0.032	
	(0.006)		(0.005)		(0.034)	
IV (Average Potential Benefits)					0.253	***
					(0.035)	
F-test of excluded inst.					52	
Estimated SSI benefit ($00s)	0.025	***	0.019	***	0.075	***
	(0.003)		(0.003)		(0.038)	
IV (Average Potential Benefits)					0.099	***
					(0.020)	
F-test of excluded inst.					22	
Using 130 Percent of the Poverty Line to Determine Eligibility for the SNAP						
Estimated SNAP benefit ($00s)	0.015	**	0.009		0.025	
	(0.007)		(0.007)		(0.034)	
IV (Average Potential Benefits)					0.284	***
					(0.033)	
F-test of excluded inst.					75	
Estimate the Take-up Equations among those over Age 65 for the SSI						
Estimated SSI benefit ($00s)	0.044	***	0.042	***	0.128	***
	(0.008)		(0.006)		(0.044)	
IV (Average Potential Benefits)					0.209	***
					(0.032)	
F-test of excluded inst.					25	

Note: * indicates significant at 10% confidence level; ** indicates significant at 5% level; *** indicates significant at 1% level.
Source: Authors' calculation based on the *Health and Retirement Study* (HRS), 1992-2010.

Appendix Table A1. *HRS Information and Adjustments for Determining SNAP Program Eligibility*

	Eligibility rules	Differences in rules for elderly and disabled households	Source of information in the HRS	Data limitations and adjustments made
Gross income test	Total income <= 130 percent of HHS poverty line.	Not subject to gross income test.	Income of respondent and spouse, plus income of additional household members (for the 1992 through 2000 data collections). Ratio of household income to the U.S. Census poverty threshold times the poverty threshold (for the 2002 through 2010 data collections).	Income data for additional household members often bracketed or missing. Use hot-deck procedure to impute (see Appendix A3). Reported household size is occasionally inconsistent with the number of observed residents. For 1992 through 2000 data collections, use the number of observed residents. For the 2002 through 2010 data collections use the reported household size.
Net income test	Total income less deductions <= 100 percent of HHS poverty line.	No difference.	See above.	See above.
Deductions				
Standard	Standard deduction.	No difference.	No information necessary.	N/A
Earned income	20 percent of earned income.	No difference.	Sum of earnings, self-employment earnings, business income, and rental income.	Income of additional household members not broken down by source. Do not include their income as earned income.

Dependent care	Uncapped deduction for dependent care needed for work, training, or education.	No difference.	Data unavailable.	Ignored.
Excess shelter deduction	Excess shelter costs > 1/2 of the household's income. Capped.	No cap.	Sum of mortgage payments, rental payments, park and association fees, and real estate taxes.	Some costs reported in brackets. For closed brackets, use the midpoint. For open brackets, use the lower bound. Utility expenditure data are unavailable, Ignored.
Child support payment	Legally owed child support to a non-household member.	No difference.	Data unavailable.	Ignored.
Medical expense	None.	Elderly medical expenses >= $35 per month.	Respondent's and spouse or partner's out-of-pocket medical expenses.	None.
Asset test				
Limit	Assets <= $2,000.	Assets <= $3,000.	Net value of real estate and secondary residences (excluding primary residence), businesses, IRA/Keogh accounts, stocks, checking accounts, CDs, bonds, and other savings and debts.	Data does not distinguish between Keogh Plans (included) IRAs (excluded). Include both.
Excluded assets	Primary home and vehicle under $4,650.	Value of vehicle used to transport a disabled household member, no maximum.	Value of primary residence and transportation assets.	No data available on vehicle use. Exclude all transportation assets.

Other				
AFDC/TANF and SSI	If all household members receive program then eligibility presumed.	No difference	Respondent and spouse's SSI income.	Data on TANF receipt unavailable. Assume no TANF receipt. Data on SSI receipt by additional household members is unavailable. Assume additional household members do not receive SSI.
Work requirements	Able-bodied household head may be required to work.	Not subject to work requirements.	Data unavailable.	Ignored.
Citizenship	Some permanent residents are eligible.	Eligible if > 65 years older and in U.S. on 8/22/96.	Place of birth.	Ignored.
Institutionalized	Not eligible if institutionalized.	In nursing home is not eligible.	Institutionalized individuals are assigned zero weight.	Limit the sample to observations with non-zero weight.

Appendix Table A2. *HRS Information and Adjustments for Determining SSI Program Eligibility*

	Eligibility rules	Source of information in the HRS	Data limitations and adjustments made
Health eligibility	Respondent is considered aged, blind or disabled.		
Aged	Respondent's age >= 65.	Age is derived from the year for which income is reported less the respondent's birth year.	
Blind	Respondent is considered blind.	Self-report of vision.	No objective report of vision is available.
Disabled	Respondent is considered disabled.	Whether disability limits work or if labor force status is listed as disabled.	No objective report of disability is available.
Income eligibility	Countable earned and unearned income is less than the federal benefit rate.		
Earned income	One-half earned income less the first $65 or $85 if the respondent has no unearned income.	Earnings from employment + self-employment, in the previous year.	Income information is annual rather than monthly. Annual income is divided by twelve. Self-employment income is available at the household level for wave 2.
Unearned income	Unearned income less the first $20.	Rental income + social security retirement income + social security disability income + pension income + social security income + unemployment and worker's comp + veteran's benefit + welfare + lump sum and other income, in the previous year.	Income information is annual rather than monthly. Annual income is divided by twelve.

Living in the household of another	Federal benefit rate is reduced by one-third if living in the household of another and not paying rent.	Not owning house and not paying rent	
Deduction for the children of an ineligible spouse	Deemed income from an ineligible spouse is reduced based on the number of ineligible children	Children in HRS family data	Data for other family members (not respondent of spouse) is unreliable and may not match the self-report of household size
Resource eligibility	Countable resources under $2,000 for an individual and $3,000 for a couple.		
Countable resources		IRA + trusts not reported elsewhere + Stocks, mutual funds, and investment trusts + Checking, savings, money market accounts + CD, government savings bonds, T-bills + Bonds and bond funds + Other savings, assets + Net value of 2nd home + Net value of other real estate + Net value of businesses	Assets are reported at the household level. Assets are divided equally between respondent and spouse. No data is available for burial plots. The total value of all vehicles is given without the number of vehicles, so a potential second vehicle is not included. Face value of life insurance is not included.

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