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The Supplemental Security Income Program and Incentives to Claim Social Security Retirement Early: Empirical Evidence from Matched SIPP and Social Security Administrative Files

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Abstract

Features of the Supplemental Security Income (SSI) program and the social security retirement system interact to create incentives for prospective participants in the aged portion of SSI to withdraw from the labor force and make an early old age insurance (OAI) claim under social security. This paper takes a first close look at this SSI-OAI interaction. The work disincentives posed by SSI rules and the potential interactions between the SSI and social security programs are outlined in a basic theoretical framework. The impact of SSI rules on the financial cost of delaying the initial OAI claim is calculated using earnings records of actual SSI recipients. Regression specifications for early OAI claims that include variables intended to capture the influence of SSI are estimated. Throughout, the analyses are enhanced by access to Social Security Administration records that have been matched to individuals in the Surveys of Income and Program Participation.

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I. Introduction

Perhaps because individuals only become eligible for the Supplemental Security Income (SSI) program at age 65, there has been little investigation of the possible incentive effects on behavior prior to age 65, including diminished work and increased participation in other programs. In fact, the incentives imbedded in SSI could lead individuals to withdraw from the labor market at earlier ages, and interactions between SSI rules and the early retirement option in the social security system reinforce these incentives. This study is the first of which we are aware to empirically investigate how behavior is affected by these program interactions (preliminary work on this issue appeared in Powers and Neumark, 2001).[1] The theory laid out below predicts that they will, but this is under an assumption of knowledge of these government programs on the part of their actual and prospective participants. Only an empirical analysis can confirm whether these interactions are important in practice. We use multiple panels of the Survey of Income and Program Participation (SIPP), linked to confidential Social Security Administration data on earnings histories, beneficiary status, and SSI recipiency, to investigate this issue.[2]

Since its inception in 1974, the SSI program has been subject to two major criticisms with regard to its treatment of the aged (Burkhauser and Smeeding, 1981). These are the inequitable treatment of social security contributors who eventually become SSI participants and the disincentives generated by the design of the program's means test. Although many SSI recipients have contributed substantially to the social security system throughout their working lives, their net government retirement benefit is weakly related to contributions. In fact, SSI recipients who qualify for social security benefits are entitled to a government transfer no more than $20 per month greater than that of a lifetime noncontributor to the social security system.

[1] We note at the outset that there is a *statutory* relationship between SSI receipt and social security receipt, because SSI recipients are *required* to claim their social security entitlements. This phenomenon is not generated by individual behavior, and it is not the focus of this paper.

[2] Throughout the paper we use the terms "SSI" and "SSI-aged" interchangeably to refer to the program for which sufficiently poor elderly qualify. We use the term "SSI-disabled" to distinguish the disability portion of the program.

While equity and incentive issues are intimately related, in this paper our direct focus is on incentives.

Burkhauser and Smeeding (1981) identify four major effects of SSI on behavior. First, SSI effectively places a confiscatory tax on retirement income exceeding small disregards, regardless of whether it is from private or public sources. This includes income from social security. Therefore a potentially important incentive for working today–additional pension income tomorrow–is eliminated by SSI rules. Second, SSI creates additional incentives for early retirement through its interaction with social security retirement rules. This occurs because the usual financial implications of making an early old age insurance (OAI) claim are nullified once the individual enters the SSI program.[3] Third, workers who think they will qualify for SSI later in life have an incentive to avoid paying social security taxes, since they receive little or no credit for these additional "contributions." Finally, SSI's asset test discourages saving. Note that this reduced need for private saving also reduces the labor supply needed to meet saving goals.

In earlier work (Neumark and Powers, 1998, 1999, 2000) we provide evidence that prospective SSI recipients respond to disincentives to work and save as they approach the age of SSI-aged eligibility. While we have speculated in past work that a by-product of decreased work may be a desire to make an earlier OAI claim (in order to meet consumption needs despite a reduction in labor supply), in this paper we go further to fully explore the interactions between the two programs. First, we examine the magnitude of SSI's impact on the net financial benefit of delaying the initial OAI claim from age 62 to age 65. Second, we closely examine patterns of initial SSI and OAI claims, paying particular attention to how the age patterns of initial claims vary according to social security eligibility status and other characteristics. Finally, using a sample of 62-64-year-old men from multiple SIPP panels, we empirically test the hypothesis that SSI program rules hasten the first OAI claim.

Because SSI is a welfare program, this topic is of general interest for understanding the retirement process of very low-income people (especially its timing) and the potential supports

[3] In fact, as Burkhauser and Smeeding (1981) point out, the only way for an SSI recipient to recoup more than an insignificant fraction of his social security contributions *is* by making an early OAI claim.

that enable retirement. If work plans are made contingent upon the structure of public programs, changes to SSER or SSI rules could have a substantial impact on retirement patterns among this group. While the issue of spillovers between programs has been studied in other contexts, it has been ignored in the case of SSI and the social security retirement system.[4]

Changes to SSI generosity or social security early retirement rules are predicted to have spillover effects on the other program. Hypothetical examples include an increase in the age of early retirement and an increase in SSI benefits. Since the availability of early OAI allows potential SSI recipients to respond to its work disincentives, enhancing the value of SSI participation, an increase in the age of early retirement may reduce SSI participation. Increased SSI benefits for elderly recipients might not only increase SSI use but also encourage more early OAI claims.

In fact, policy changes of direct relevance to this issue are occurring, including a change in the normal retirement age. Beginning with the 1938 birth cohort, the normal retirement age is scheduled to rise to age 67 for birth cohorts after 1958. Since the early retirement age will remain at 62 indefinitely under current law, this two-year lengthening of the early retirement period causes a reduction in the value of the OAI benefit, as the actuarial reduction increases. For example, while a worker born prior to 1938 faces an actuarial reduction of 20% of the benefit for claiming at age 62 rather than waiting until age 65, a worker born in 1960 faces a reduction of 30%. Our model predicts that such a change will further discourage SSI receipt among the elderly.

The next section presents the relevant institutional detail on the SSI and OAI programs. Section III presents the theoretical framework and resulting hypotheses. Section IV presents computations of the financial impact of delaying OAI, based on the complete social security earnings records of actual SSI participants. Section V presents information on the data set and

[4] Most of the economics literature on program interactions involving cash welfare has focused on Medicaid policy. Yelowitz (1998) finds that the value of Medicaid increases SSI-disabled participation. Blank (1989) and Yelowitz (1995) find evidence that the value of Medicaid also increases AFDC participation. McGarry (1996) finds little influence of Medicaid on SSI-aged participation, however. Kubik (1999) and Garrett and Glied (2000) find evidence that households' participation in SSI-disabled is related to financial incentives posed by the AFDC and SSI programs.

descriptive information on SSI and OAI use. Section VI presents the empirical findings from specifications of early OAI claims that incorporate information about SSI. The relevant prior literature is discussed at appropriate points throughout the paper.

II. Program Background

Social Security

The 1935 Social Security Act provided monthly retirement benefits to workers aged 65 and over and a lump-sum death benefit to the estates of these workers. Since 1961, men and women as young as 62 have been allowed to collect benefits, provided they have accumulated at least 40 quarters of sufficient social-security-covered earnings. The social security benefit is based upon a primary insurance amount (PIA) computed from average indexed monthly earnings (AIME) for the 35 highest-earning years.[5] An actuarial reduction is applied to the PIA of an early retiree to compute his benefit. If an individual chooses to work and receive a social security benefit prior to his full retirement age in the era of our sample, benefits are reduced by $1 for every $2 in earnings over a given threshold. Recently, this reduction was eliminated.[6]

Supplemental Security Income

The SSI program was begun in 1974 to provide a uniform federal safety net for the elderly and disabled. The concern of this paper is with the elderly component, which sufficiently poor individuals may participate in upon attaining age 65. While SSI is largely a federal program, there is state variation in benefits policy and administration. The federal government sets eligibility criteria and maximum benefit levels for individuals and couples in the federal portion of the program. Since some states (those with more generous safety nets prior to 1974) were required, and other states chose, to supplement the basic federal benefit, there is also cross-state benefit variation. Wealth holdings also affect eligibility. In the federal program, couples'

[5] While an alternative minimum benefit is still on the books, it was largely phased out by the time of our sample.

[6] The threshold at the time of the law change was $9,600. While Congress ended the so-called "earnings test," these benefit reductions were in fact offset by actuarially adjusted benefit increases upon attainment of the full retirement age, a feature that was little understood by recipients or policymakers (Gruber and Orszag, 1999).

resources–after exclusions of specific items like home equity–may not exceed $2,000; for individuals the figure is $1,000 (Social Security Administration, 2001).

The federal SSI benefit is generous relative to other welfare programs, and the SSI program comprises a potentially substantial source of income for the elderly poor. Federal SSI, when combined with Food Stamps, brings an elderly household's resources close to the federal poverty line. State supplements can also be large. For example, in January 1991 (within our sample period) the maximum monthly federal benefit was $407 for an individual and $610 for a couple. At that time, the highest state benefit for couples was in California, which resulted in an increase above the federal level in the maximum obtainable benefit of 55% for individuals and 91% for couples.

SSI benefits are reduced with other sources of retirement income. $20 per month of unearned, non-transfer income, $65 of earned income, and one-half of earnings exceeding $65, are disregarded in computing the SSI benefit.[7] The disregards are not indexed for inflation, nor are they differentiated by household type (couple or individual).[8] The federal benefit is reduced by one-third for filing units living in the household of another, and states are free to vary supplements according to living arrangements. We do not consider differentiation in benefits by living arrangement (we do differentiate benefits by filing unit type).[9] In most cases, the monthly SSI benefit is determined by the formula:

(1) SSI benefit = Guarantee - ½ Max{earned income-Min{earned income, $65},0}

- Max{unearned income - Min{unearned income, $20},0}

- {means-tested transfer income}.

The guarantee is the benefit amount paid when there is no other income. Earned income refers to the current earnings of the SSI recipient. Unearned income includes income from

[7] In addition, certain home energy and support and maintenance assistance, Food Stamps, most federally-funded housing assistance, state assistance based on need, one-third of child support payments, and income received infrequently or irregularly are excluded.

[8] While some states vary their disregard amounts from the federal level, it proved difficult to incorporate this information given the idiosyncratic way in which different disregards are applied and the detailed knowledge about income sources that is needed to assign them appropriately.

[9] We provide some descriptive information on living arrangements below.

private pensions, public pensions such as social security, interest income, and the like. Means-tested transfer income (e.g., Veterans Benefits) offsets SSI income dollar-for-dollar and none of it is disregarded. These deductions for other income are first applied to the federal benefit amount. When the computed SSI benefit is positive, the filing unit is eligible for the federal program.[10] If there is any excess income, it is deducted from the state supplemental payment (Social Security Administration, 1994, pp. ii-iii), and the unit only receives a state benefit.

The number of SSI-aged recipients has been falling over most of the program's history. By 1998, 1.4 million elderly people participated in SSI, down from 2.3 million in 1975 (Social Security Administration, 1999, Table 7.A3, p. 287).[11] This downward trend, largely completed by 1984, is due to the increasing affluence of the elderly, increasing social security coverage of this population, and the increasing value of social security benefits claimed. SSI recipients are *required* to apply for all public benefits for which they may be eligible, including social security, and most SSI recipients are eligible for at least a modest social security benefit. By September 1993, 65% of aged SSI recipients received social security benefits and 22% received some other unearned income. SSI recipients have little else to rely upon. Only 2.1% reported any earned income, while almost none reported private pension income (1994 Green Book, Tables 6-16 and 6-17). By December 1999, slightly less than 60% reported social security benefits, 15.8% reported other unearned income, and 1.6% reported earned income (Social Security Administration, 2000, Table 7.D).

Due to receipt of social security, the average SSI-aged benefit payment actually received is fairly low. In September 1989, the average federal payment to all elderly households on SSI was $163, with an average state supplement payment of $133 (49.6% of aged federal SSI recipients received a state supplement–1990 Green Book, p. 717). Zedlewski and Meyer (1989) estimate that only about 30% of the elderly poor receive SSI benefits, while McGarry (1996) and Warlick (1982) determine that around one-half of potential filing units that appear eligible based

[10] People who receive only a state benefit and live in states without federal administration of both the federal and state components of the program do not have an administrative record with SSA.
[11] During our sample period, 1984-1996, the SSI-aged caseload is stable, with roughly 1.5 million elderly participating each year.

on survey information actually enroll in the program. McGarry (1996) analyzes SSI participation and attributes much of the low take-up by potential eligibles to the quite modest cash benefits for which most elderly poor would actually qualify.

III. Modeling SSI and OAI Receipt

In this section, we lay out the theoretical framework underlying the linkages between SSI and SSER. To illustrate most of our points, we use a simple model in which leisure and consumption are choice variables but saving is not allowed. The results in this case are then contrasted with a model in which saving is possible. Finally, the implications of possible extensions to the models are briefly discussed. The theoretical discussion proceeds in two phases. In the first phase, we review the incentive to participate in SSI and the concomitant work disincentives of the SSI program. In the second phase, we discuss how SSI and OAI rules interact in the budget constraint to enhance incentives to claim OAI early. The technical background to the discussion is contained in Appendix A.

SSI Participation and Work Disincentives

Consider a simple model in which people live for two periods. In the first period the worker chooses how much to work and consume. In the second period, consumption is financed solely by pension benefits and welfare. Financial resources cannot be transferred between periods. Pension benefits–which may be from both private and public sources–are determined as an increasing function of first-period earnings. Since all income is consumed each period, once the first-period leisure choice is known, the other choices are determined. First-period work hours affect second-period retirement income by increasing social security and private pension benefits.

We introduce an SSI policy into this framework. An SSI policy is characterized by a maximum benefit level (G), an amount of pension income that is disregarded before the benefit is computed (D), and a rate at which pension income in excess of D is reduced (in the case of SSI, this rate has always been 100%). In the first period, the person is not age-eligible for SSI.

In the second period, the person is age-eligible and could be income-eligible, so long as retirement income is not too high.

The worker's global optimum is found by considering his actions in each of several scenarios. Each scenario is characterized by the decision to participate in SSI or not and whether second-period income is above or below the disregard. Budget constraints and the first-order conditions associated with the local optima are presented in Appendix A. Work effort is affected by SSI policy in determining both local and global optima, and it is straightforward to show that a more generous SSI policy discourages work effort, due to the implicit confiscatory tax on pension income imposed by SSI in period 2. In two scenarios, the SSI guarantee has no effect on behavior. First, in the local optimum with nonparticipation, SSI policy is irrelevant. Second, the SSI guarantee has no effect on labor supply in the local optimum where an SSI participant's income exceeds the disregard amount. In this instance, the person's labor supply depends solely on consumption needs in period 1, because there is no way to influence period 2 resources by adjusting first period labor supply (second period resources are G+D regardless). Because of the inability to transfer resources in this model, the size of the SSI guarantee can have no impact on first-period consumption and hence on work decisions. Finally, in the case of SSI participation with income below the disregard, the Appendix demonstrates that labor supply is negatively related to the guarantee.

What is actually observed, of course, is the global optimum. It is straightforward to demonstrate that an increase in the SSI guarantee widens the gap between the lifetime utility value associated with SSI-participation versus non-participation outcomes. Since all choices involving SSI participation are associated with lower labor supply, the fact that an increase in G widens the portion of the budget constraint over which participation is attractive implies that the increase in G will also decrease labor supply globally.

Incentives to Accelerate the OAI Claim

Now consider the addition of an early retirement insurance program to this model. This policy is described by a benefit, B_0, to which the individual is entitled at the full retirement age in

the second period; an actuarial reduction rate (β) to be applied in the case of early retirement in period 1; and an implicit tax rate (τ) on the earned income of early retirees.

It is evident from examining the budget constraints associated with the various permutations of program use that combining SSI participation with an early OAI claim is usually advantageous. When the worker participates in SSI in period 2 (focusing on the simplest case, where second-period nonwelfare income will exceed the modest disregard), his total period 2 resources are determined by the SSI benefit schedule. There is no advantage to deferring social security receipt, because the actuarial benefit reduction for early retirement is effectively removed in the second period by the SSI program. Therefore, the worker's early retirement decision is made solely on the basis of whether he can obtain higher utility in period 1 as a consequence. This depends upon the tradeoff between the early retirement benefit, the tax rate on earnings (above the disregard) in the OAI program, and the worker's preference for leisure versus consumption in period 1. Appendix A presents the various cases and argues that for the sort of low-wage workers who are potentially eligible for SSI-aged, utility is higher when SSI use is accompanied by an early OAI claim. This is obvious in the case where workers are not subject to the social security earnings tax: for any choice of work hours, the worker is always better off receiving earnings plus the OAI benefit (βB_0+wh) rather than earnings alone (wh), and in either case second-period consumption will be G+D.

Because the net government transfer is determined by SSI policy in period 2, early retirement is "costless," in the sense that the actuarial reduction in benefits that would normally give an early retiree pause are lifted when the second period is reached. The exception is if the individual faces a very low level of retirement income that falls short of the SSI disregard level of $20. In this unlikely event, the agent is in the traditional situation of balancing the benefit of receiving some social security benefits today against the lifelong actuarial reduction for early retirement.

Other Considerations and Extensions

It is interesting to note that incentives for using SSI and SSER are different in a simple model allowing saving. As we have mentioned, SSI has an asset as well as income test. In this

case, when weighing whether to participate in SSI, the agent decides if it is worth having to consume sufficiently more today and consequently less in the future in order to maintain asset-eligibility for SSI.

In a model permitting saving but not a choice of labor supply, the effective neutralization (after age 64) of OAI's usual actuarial reduction in social security benefits still serves to make an early claim more attractive. However, in contrast to the model just presented, the possibility of collecting OAI early cannot alleviate–and in fact serves to aggravate–the problem of intertemporal distortion brought about by SSI. This is because in a model with saving and an asset limit in the SSI program, the problem is one of allocating *too much* consumption to the first period in order to meet the asset test. Not surprisingly then, in a model allowing both labor choice and saving, the predicted effect of SSI benefits on labor supply is ambiguous. While we have presented empirical evidence (Neumark and Powers, 1998) that the SSI asset test may discourage saving, we believe that the predominant problem individuals face is maintaining income just prior to retirement, while responding to the labor supply disincentives of SSI. In this case an early OAI claim is relatively *more* attractive to those who will be eligible for SSI. Ultimately, this is an empirical question.

The models discussed to this point simplify but convey the basic insights for understanding the interactions of SSI and OAI. Some potentially important issues cannot be addressed easily in this framework. One possibility is beginning SSI participation after (rather than at) age 65, which we only address through the empirical implementation and do not attempt to model explicitly. Similarly, the age of retirement could in principle be treated as endogenous, although since labor supply is so heavily taxed by both programs in the sample period, we suspect that the essential qualitative predictions would be unchanged.

In addition, there are several relevant sources of uncertainty, including health, family structure, and job stability. Those facing a high probability of adverse health shocks have a greater incentive to ensure SSI eligibility because SSI automatically brings Medicaid coverage.[12]

[12] However those with sufficient quarters of covered earnings are eligible to purchase Medicare coverage at modest premiums after age 65.

In the pre-retirement period, individuals may be uncertain of their future marital status and options to continue working. The prospect of widowhood introduces uncertainty about the size of the future benefit payment and consumption needs. Those facing high probabilities of job loss might engage in precautionary saving to prevent a "zero consumption" outcome. These precautionary savings may be sufficient to render them ineligible for SSI (at least at age 65), even though others with equal permanent income might make choices that assure SSI eligibility. In a world of certainty, people intending to participate in SSI might display low work effort and low saving throughout much of their lives. However, due to uncertainty, people may delay committing to an SSI-participation strategy until sufficient information is revealed or, until they are reasonably close to the eligibility age.

Family structure is also ignored in these simple models. Husbands and wives may determine their labor supplies jointly and presumably saving decisions are made collectively. In the "male chauvinist" model (Killingsworth, 1983), the wife regards the husband's labor supply (and income) as exogenous to her labor supply decision. This implies that when analyzing married men, we need not be concerned with wives' labor supply. However, there is some evidence against this model, more consonant (in some circumstances) with joint decision making (e.g., Lundberg, 1988). Consequently, we include exogenous factors affecting the wife's labor supply in the husband's labor supply specification.

IV. The Cost of Delaying Social Security Retirement under SSI

Computations of the financial impact of delaying the first OAI claim give an indication of whether the apparent incentives to accelerate retirement imposed by SSI are of practical importance. The approach to computing old age transfer wealth (OATW) is similar to that laid out in Diamond and Gruber (1999). Diamond and Gruber (1999) assume a lifetime earnings stream. To conceptually separate the impact of the OAI claim date from the decision to withdraw from the labor market, they assume that individuals receive earnings through age 70, regardless of when they initiate OAI. At each claim date, they compute an expected social security benefit using the social security rules in effect for individuals born in 1925 (including

any benefit reductions due to earnings received after the claim) and an assumed earnings profile.[13] Next, they discount the lifetime stream of benefits to a base year of 1980 using an assumed risk-free interest rate and sex-specific mortality rates. A maximum life span of 120 years is assumed.

In the absence of the complications of SSI policy, there are two direct determinants of the cost of delay. First, benefit recomputation is possible. By delaying the claim, it is possible for current earnings to replace a very low-earning year in the computation of average indexed monthly earnings (AIME). Since the 35 highest years of earnings are used for the AIME computation, and the primary insurance amount is a fraction of the AIME, the scope for a substantial change in the benefit due to recomputation is quite limited.[14] Only in the extreme case of a worker with quarters close to but not yet reaching the coverage minimum of 40, where an additional quarter of covered work tips a person's status from OAI-ineligible to OAI-eligible, would there be a large impact of recomputation on OATW.[15] Second, to the extent that a person's mortality risk exceeds that assumed by SSA, the statutory reduction for early retirement is actuarially favorable to the individual. For example, Duggan and Soares (2002) find that the statutory actuarial adjustments for early retirement create incentives for low-income males to claim early.

SSI policy interferes with both mechanisms that determine the gain to delaying the initial OAI claim. This arises directly from the 100% tax on social security income, aside from the first $20. Because of the SSI benefit schedule, once a person enters SSI, their old-age government transfer is determined at the margin by the SSI guarantee. The amount of the social security benefit paid to them is rendered nearly irrelevant, since the person's old-age transfer income is effectively capped at the SSI guarantee level (plus up to $20 per month from OAI). Any

[13] It is not clear whether they use a representative earnings profile for this particular cohort.
[14] In examples constructed to generate recomputation, the change in the final monthly benefit was usually $1 to $2.
[15] Note that this would have a large impact on OATW in a world without SSI, but *little* impact under SSI (since the computation of the SSI benefit gives little credit for past social security contributions).

advantage to recomputation or disadvantage from the actuarial reduction is rendered temporary, lasting only from the point of the initial OAI claim until the point of SSI application.

We are fortunate to have actual social-security-covered earnings histories for most SIPP adults. We therefore use the actual earnings histories for sample members through age 61 as a basis for our government benefit computations. For earnings reported after age 61, a concern is that the effects of policy could be introduced into the OATW computations through the endoegeneity of labor supply, clouding the interpretation of our results. Therefore, using the CPI-U, we inflate age-61 earnings to extend the earnings profile through age 64. In contrast to Diamond and Gruber (1999), we assume that earnings drop to zero at age 65, rather than at 70. This assumption is consistent with observed behavior (as noted, almost no SSI-aged participants report earnings) and addresses some practical concerns (chiefly, many individuals who really are SSI participants would not be financially eligible were we to assign them hypothetical earnings past 64). It remains the case, as in Diamond and Gruber (1999), that the labor force exit decision is held constant throughout the exercise, because we do not examine retirement behavior beyond age 65.[16] Finally, we discount the OATW values for our sample members to age 62, rather than age 55, using an assumed risk-free interest rate of 3% and sex-specific mortality rates.[17]

We focus on two types of filing units because their OATW can be computed without further assumptions. These are individual male claimants and married couples in which the wife does not qualify for her own social security benefit. To define the samples, we take all men in the 1984 and 1990-1996 SIPP panels eligible for OAI by the time they are 62 years old, and who appear in the SSI administrative file. We also drop men born prior to 1920, because they face substantially different social security program rules. For couples, we only examine cases in which the wife has fewer than 20 quarters by age 62, so that she is unlikely to qualify for SSI

[16] The accurate computation of social security retirement benefits was a key element in this project. We checked our computations by comparing results using a wide variety of earnings profiles for individuals and couples to the results of the Social Security Administration's publicly available benefit calculator. In all cases, our calculated benefits came within $1 of the SSA simulator.

[17] Note that we do not think that these mortality rates reflect the private information of our sample members very accurately. The levels of rates of return are not of major interest, rather the difference in rates that is generated by introducing SSI policy.

over the relevant time horizon. The wife receives a spouse benefit under OAI equal to one-half of her husband's benefit.

The findings reported in Table 1 demonstrate that the SSI program dramatically alters the financial terms associated with the timing of the first OAI claim. The top panel shows average results for sample members. The next two panels repeat these figures for the top two-third and top one-third of earners in our samples of married and lone men. At age 65, the social security benefit replaces around 60% of average earnings for couples and around 66% of average earnings for singles, while the SSI benefit replaces more than 100% of average earnings for couples and 91% of average earnings for singles.[18] Because of the progressivity of the SSI and social security benefit formulae, replacement rates supported by both programs decline with earnings.

For both couples and singles, in the absence of an SSI program, there is 5% annual return to OATW of delaying the initial OAI claim from age 62 to age 65, in the form of increased OATW. For married couples, the benefit from delaying retirement in the absence of SSI grows with income (earners in the top one-third of the distribution gain around 6% annually in OATW from delaying the first OAI claim), while the cost to delaying retirement under SSI grows also. For singles, the gain from delaying retirement for higher earners in the absence of SSI declines slightly with rising earnings. In both cases, once SSI is considered, there would be a minimum *loss* of 2% of OATW per year if the filing unit were to delay their OAI claim to age 65. However, as in the case of couples, the loss from delaying the first OAI claim under SSI is modestly worse at higher income levels.

V. Data and Descriptive Information

Throughout, we use public-use panels from the SIPP that have been matched to SSA files by the Census Bureau. While much of the analysis is restricted to males, we include information

[18] One of the characteristics of SSI recipients is that they frequently have many years of zero earnings. Since we are using actual earnings records to calculate our figures, we use average indexed monthly earnings, suitably deflated, as the denominator for the replacement rates.

about wives that may be relevant for husbands' choices. In this section, we describe the data sources that have been combined for this project and present basic information on how the sample members use SSI and OAI.

Public-Use Data

Administrative data are currently available for six SIPP panels, 1984, 1990, 1991, 1992, 1993, and 1996.[19] The SIPP repeatedly interviews a large, nationally representative group of households, typically following them for a period of 2.5 years. Because SSI serves a fairly small number of people, and because our formal empirical analyses are for the restricted age group of 62-64, the panels are pooled to create our basic sample. Throughout this paper, males are the primary unit of observation. From the SIPP, we have detailed information on demographic characteristics (e.g., birth cohort, race, education, prior marital status), living arrangements, general health, and work-limiting disability for each sample member and his spouse.[20] The SIPP also collects detailed, self-reported information on public program receipt, including whether social security is received, the reason it is received, and whether SSI is received. Core information (i.e., information that is repeated at every interview) is taken from the first interview. Health information is from the third interview (one year later).

Administrative Data

The Census Bureau matches select SIPP panels to SSA records.[21] We have been allowed access to SIPP-matched confidential data on experience in the SSI program (from 1974), social security-covered earnings and quarters (from 1951), and OASDI beneficiary information (since the early 1950s). The Census matches the files at the first interview wave, so attrition bias is not an issue. Typically 10% of SIPP adults fail to match to the earnings record database (the

[19] 1984 is the first SIPP panel. Panels were not launched in 1994 or 1995. The SIPP resumed in 1996 with a much larger panel (and abandoned its overlapping panel design).

[20] We exclude a handful of men from the sample who report they are currently married but who do not match to a spouse record in the SIPP.

[21] Once the match is made, observations in the administrative data are assigned their corresponding SIPP identifiers. End users of the data have no access to the social security numbers.

exception is the 1984 panel, where the failure rate is 13%). Nonmatches are caused by reporting or coding errors in the social security number.[22]

The SSI file contains a complete record of case actions since the program's inception in 1974, including application dates, monthly payment status, and information about the type of filing unit to which the individual belongs. It is SSA's policy to reclassify disabled SSI beneficiaries as aged at their 65th birthday. In addition, since SSI-disabled claims sometimes take years to adjudicate, older applicants may find themselves age-eligible for the program before their disability claim is resolved. We are most interested in those who are truly participating in the aged component of the program, rather than household units who "age in" from the disability program, as the motivations and incentives facing the disabled can be quite different.[23] Therefore, we use information on both application and payment dates to determine SSI-aged status. Since the SSA encourages people to contact them several months before they hope to receive their first benefit, we define an SSI-aged recipient as a person who applies for SSI after his 64th birthday and receives his first SSI payment after his 65th birthday.

The earnings file contains social-security-qualified earnings by year, as well as a count of covered quarters in each year. We use this information for several purposes. Covered quarters are used to determine the precise OAI-eligibility statuses of men and their wives. By applying social security rules to the earnings records, it is possible to compute the expected OAI benefit at various ages and under various assumptions (as was done above to compute OATW under alternative scenarios, e.g.). As noted above, these benefit computations are done with a high degree of accuracy. We use these and other variables constructed from the earnings information as key explanatory variables in the regression analyses below.

The beneficiary file is not as obviously important to the project as the previous two files. However, our findings ultimately reveal the value of accessing this information. Similar to the

[22] Communication from Howard Iams, Division of Policy Evaluation, Social Security Administration. Any SIPP sample member with a security number appears in the earnings file, regardless of whether they have ever worked in covered employment. In contrast, only actual claimants appear in the SSI and beneficiary files.

[23] One obvious difference is that DI claimants qualify with fewer than 40 covered quarters.

case with SSI, the original claims of older individuals who are observed receiving a social security benefit can often be traced back to a disability insurance (DI), rather than OAI, claim. Retirement beneficiary status is identified by combining information about current coverage type with information about past DI benefit receipt. We identify "early retirees" as those who claim a social security benefit prior to their 65th birthday but no earlier than their 62nd birthday, are the primary beneficiary (i.e., not a spouse or survivor claiming on another's earning record), are classified as an OAI recipient for their most recent claim, and do not have a history of DI claims.

The use of SSA records greatly enhances the empirical evidence that can be brought to bear on this topic along a number of dimensions. While the SIPP is designed to collect information on government program receipt, the quality of the data is limited by the accuracy of respondents' reports for themselves and others. Respondents may be especially confused about exact beneficiary statuses, conflating retirement and disability, or confusing the SSI and social security programs themselves (both are typically administered at the SSA office, after all).[24]

Access to each sample member's SSI history greatly increases the ability to study SSI-aged participation. The SIPP time horizon is simply too brief, and the number of SSI recipients too small, to observe more than a few entries into SSI-aged in each panel. In contrast, we can use the administrative data to track some sample members for as long as 15 years beyond the survey and can observe older members' SSI activity prior to the first interview.

Finally, it is possible to construct key variables that are simply unavailable in the absence of administrative data, such as OAI eligibility, and whether the government old-age transfer is more likely to be determined at the margin by the SSI or the social security program. It is also helpful to control for other factors, such as lifetime earnings, that may be highly correlated with both an individual's unobserved type and his propensity to use the SSI program.

The administrative data are not without limitations. When disputes or mistakes about claims are resolved, the administrative files are altered to reflect the history of SSI and OASDI

[24] The distinction between SSI-aged and SSI-disabled may still not be perfect. For example, a person may have received SSI-disabled, made a full recovery, and then come into SSI-aged. We err on the side of treating such a person as "SSI-disabled" since their first payment was received prior to age 65.

receipt for individuals as it *should have been*, not as it actually unfolded. This generates errors in the recorded timing of payments. Given our focus on the aged (in contrast to the disabled), whose eligibility rules are fairly cut-and-dried, this should not generate substantial errors, particularly since we also rely on application dates (which should not have been changed) to define SSI-aged status. Finally, it should be noted that we were only granted access to SIPP-matched observations, not the universes of SSI clients or social security covered earners or beneficiaries.

Descriptive Information on SSI and OAI Claimants

Before proceeding to a formal analysis of the hypothesis, this section presents descriptive evidence on the use of SSI and OAI. The public-use and administrative data are combined to investigate the surface plausibility of the hypothesis. It is documented that a substantial fraction of SSI-aged recipients are in fact eligible for OAI at age 62, that a substantial degree of "take-up" of SSI occurs very close to age 65, and that SSI recipients are quite prone to claim OAI early.

We begin with a large sample of individuals who are either the reference person or spouse of a reference person and who are least 30 years old. Out of this entire group of 168,684 people, 11,941 (7.1%) ever applied for SSI and 8,141 (4.8%) ever received an SSI payment. Information on living arrangements of claimants collected by SSA indicates that 64% are individuals, 24.8% live with spouses who also qualify, and the remaining 11% live with spouses who do not qualify.[25]

614 of the men who match to the SSI file meet our strict criteria for "SSI-aged" (the payment occurs after the 65th birthday and the application occurs after the 64th). Most (87%) of these men also have some social-security-covered earnings on their record. Of the group with any covered earnings, 61% are OAI-qualified by the time they reach age 62. Rates of OAI coverage of men are much higher than those of women, as one might expect for these older cohorts. Among females classified by SSA as SSI-aged recipients living alone, for example, only 40% are OAI-qualified by age 62.

[25] This data element represents the most recent ("current") program category and living arrangement.

Using administrative records, we compute the age in months at first SSI application, first SSI receipt, and first OAI receipt. Figures 1a and 1b present age patterns of SSI applications and receipts, respectively, for the sample men. If the process of entering SSI-aged is not very age-dependent, it is less believable that people use SSI and an early OAI claim in a complimentary fashion. After all, the mechanism that makes the early OAI claim financially attractive hinges on the "penalty phase" of the actuarial reduction being as short as possible.

Figure 1a shows the frequencies of applications and first payments for men by age.[26] Payments are age-dependent, with a strong spike at age 65. In fact, the number of people receiving their first payment at age 65 is five times larger than the number receiving a first payment at age 62, and nearly three times larger than the number receiving a first payment at age 66.[27] The pattern of applications is smoother, as one might expect, and illustrates why it could be misleading to look only at payments over some age ranges. First payments are more frequent once people reach their late 50s. However, they are not particularly high in their early 60s, and again there is a strong spike at age 65. More importantly, for those receiving a first payment after their 65th birthday, these payments are highly concentrated at age 65, rather than being dispersed over older ages. Application and payment frequencies are in fact quite similar after age 65. Most who apply for SSI-aged do not wait long beyond age 65.

Figure 1b gives a different view of the same underlying data, displaying hazard or "exit" rates from the group of individuals who receive or apply for SSI, by age. At each age, the graph shows the fraction of all individuals who will receive or apply for SSI during or after that age, and who initiate receipt or an application at that age. For visual clarity, a narrower age group is presented (hazard rates prior to age 45 are quite flat and low). Again, both payments and applications are strongly age-dependent. There is a modest spike in applications around age 61.

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[26] Note that this represents all males filing as individuals and most filing units that are couples. Figures 1a and 1b are based on samples of 3,340 males with applications and 2,605 males with recorded payments. Women applying as individuals are not represented. In general, for women filing as individuals, there is more first entry into the program at older ages, which may reflect the phenomenon of poor widows in this group.

[27] As mentioned, we compute age of first claim by age in months. For these graphs and frequencies, we have rounded this variable down to arrive at the person's age in years.

There are pronounced spikes in both series at age 65. Over 40% of those remaining who will apply do so at age 65, and 56% of those remaining who will receive a payment receive their first payment at that age.

Figures 2a and 2b contrast the age patterns of first SSI receipt for men who are categorized as "aged" filing units by SSA, according to whether they are OAI-eligible at age 62 or not.[28] The motivating idea is to see whether those who would be able to collect OAI at ages 62 through 64 apply for SSI at earlier ages than those who cannot. Again, this speaks to the plausibility of households using the two programs in a complimentary fashion. It is evident from a comparison of the two figures that the age pattern of first SSI payments for non-OAI-covered units is much more dispersed than that for covered filing units. While a fair number of OAI-ineligible units receive their first benefits in their 70s, first receipt drops dramatically after age 65 for the OAI-eligible group. The fact that there is a much greater age dispersal of first SSI claims among the non-OAI-qualified suggests that the SSI claims pattern my not be entirely the result of financially desperate households applying as soon as possible. However, a plausible alternative explanation to the hypothesis already proposed is that OAI enrollees, on average, learn about the SSI program at earlier ages than non-enrollees.

Finally, Figures 3a and 3b contrast the OAI receipt patterns of SSI-receiving males in aged households with those of other males in the sample.[29] If SSI-aged recipients use OAI much like other groups, one reasonably expects little connection between the two programs based upon the theoretical arguments presented above. Figure 3a shows the first age of OAI receipt for a "control" sample of low-education men. Men with less than a high school degree are selected for generating the comparison graph, since they may share the problems of lifetime low resources of SSI-aged-participating men (in fact, these men have an age pattern of OAI claims that is quite similar to that generated by all men in the SIPP). The distribution has two humps of nearly equal

[28] These figures were made using Stata's kernel density graph option, using 209 observations for figure 2a and 327 for figure 2b. While the administrative data should be largely error-free, ages at first application/receipt are computed in fractions of years. Information about, e.g., whether a payment is received very close to age 65 or when the individual is nearly 66 is in principle useful and is incorporated into these graphs.

[29] Approximately 560 observations were used to generate figure 3a and 420 to generate figure 3b.

height, one at age 62 and one at age 65. Figure 3b illustrates that the first OAI claims of SSI-aged men differ dramatically. The distribution still has two humps, but the age-62 hump is nearly twice as high as the age-65 hump. SSI-aged males claim OAI near age 62 more than other OAI-qualified males.

VI. SSI and the Timing of Initial OAI Claims

It is difficult to discern the "strategic" use of OAI and SSI from other reasonable scenarios. A compelling alternative scenario is that some economically vulnerable households are extremely reliant on government programs for their income. They tend to get on OAI as soon as it is permitted, and they also tend to enroll in SSI as soon as possible. Inadvertently, their behavior is "smart" in light of the rules and incentives outlined above. While this may be fortunate, this consistency does not imply a conscious design on the part of claimants.

Figures 3a and 3b provide some *prima facie* evidence of accelerated OAI claims that is consistent with the hypothesis that people respond to the financial incentives posed by the SSI program. Our first step is to extend this exploration to a regression framework, in order to determine whether a variety of observed differences between SSI and non-SSI claimants may be associated with the accelerated OAI claims of SSI-aged participants, rather than SSI-aged participation itself (this comparison is contingent on both groups being OAI-qualified, of course).

The choice to initiate OAI prior to the normal retirement age is modeled as a function of the financial cost of delay, characteristics governing mortality expectations, earnings, preferences, and for married couples, the possibility of coordinating spousal retirement plans. As discussed, in the absence of SSI, the financial cost of delaying the first OAI claim is governed by two factors. These are the individual's relative mortality risk and any benefit increase due to the recomputation of the PIA with an additional year's earnings. As controls for mortality risk, we include sample age (62-64), birth cohort (capturing secular trends in health for the cohorts covering 1920-1934 in our sample), self-assessed health, marital status (married men have significantly lower mortality than their unmarried counterparts), education (better educated men

tend to live longer and have better earnings alternatives), and race (blacks have significantly greater mortality risk than whites). We predict that older men, members of earlier birth cohorts, those reporting poor health, unmarried men, less educated men, and black men are more likely to make an OAI claim prior to age 65. We also include the social security replacement rate, computed as if the worker retired at age 62, as another indicator of the value of retirement relative to continuing to work (we expect those with higher replacement rates to be more likely to retire, *ceteris paribus*). As noted, benefit recomputation, especially given a person has achieved 40 covered quarters before age 62, as in our sample, is not an important consideration.

After establishing that SSI-aged recipients take OAI earlier, controlling for other important factors, we proceed to a test of the behavioral hypothesis that financial incentives in the SSI program cause accelerated OAI claims. We attempt to measure whether an individual faces an old-age transfer determined by SSI rules, rather than OAI rules, based on their expected social security benefit. However, the theory indicates that facing an old-age transfer determined at the margin by SSI is endogenous with an early OAI claim. Therefore, we determine the relevant portion of the old-age budget constraint that each man faces by computing his social security benefit at age 62, assuming no earnings after age 61. While this overstates the number of sample members who are financially eligible for SSI, the variable is exogenous with respect to the early retirement decision. For married men, we construct the combined social security benefit for husband and wife and compare it to the SSI benefit for couples to determine eligibility.[30] Again to avoid endogeneity with male retirement plans, the variable is constructed under the assumption that the wives stop working when their husbands reach age 62.

Empirical Findings

Table 2 presents basic findings from probit estimates of four different social security receipt variables, ignoring information about the SSI program or SSI use for the time being.

[30] We use the spouse benefit (one-half of the husband's), or the wife's own benefit as a worker, depending on which is largest. We also allow husbands to collect a spouse benefit, if this is indicated by a comparison of the social security benefits the husband and wife would be owed as workers. Note that for 11% of the men in our administrative sample of SSI-aged households (as classified by SSA), the husband was eligible but the wife was ineligible. This should be almost entirely due to age differences, which we account for in determining potential filing status.

Most spouse characteristics (including education and health) proved insignificant and were dropped from all specifications. In addition, birth cohort variables were dropped in lieu of panel dummies and sample ages, which convey nearly the same information, given the sample construction. The first column of the table contains sample statistics for the relevant variables. The next two columns contain coefficient estimates of social security receipt, as self-reported in the SIPP. The last two columns present estimates of early social security and OAI claim variables that are constructed from the administrative data.

Turning to the specifications for self-reported early social security receipt, the second column displays estimated impacts of the exogenous variables on the probability that a member of the sample currently reports social security benefit receipt prior to age 65, including DI receipt. The third column provides estimates for the current self-reported receipt of a social security retirement benefit ("OAI"). The age-62 social security replacement rate (which averages 42% for the sample) is a negative predictor of early receipt, contrary to expectations. A 1%-point increase in the replacement rate results in a 0.29 percentage-point decline in overall social security receipt and a half-percentage-point decline in OAI receipt.[31] The likelihood of benefit receipt rises with age-in-sample. Black sample members appear no more likely to collect social security by age 64 for any reason, but are 8%-points less likely to collect early OAI (contrary to expectations). There is a pronounced difference between the impact of health on self-reported social security versus OAI receipt. In general, social security receipt pre-age-65 declines with improving health status. However, the qualitative influence on early retirement is quite different, with sample members who report fair-to-good health more likely to report OAI benefits than those reporting poor health (the omitted category). Currently unmarried sample members are more likely to report any social security benefit and to collect an OAI benefit, as expected. The state unemployment rate has no effect on self-reported receipts. The effects of educational attainment are as expected, with the highly educated (college graduates) much less likely to self-report social security benefit receipt. Cohort effects differ from expectations (under the strong

[31] The estimated coefficients of the other variables are quite robust with respect to the inclusion of the replacement rate variable.

assumption that cohort membership primarily conveys mortality changes). More recent cohorts (as indicated by panel membership) have higher expected participation probabilities.

In the last two columns, the results for specifications for early (pre-65) social security and OAI claims of these same sample members are presented. In column 3 the findings for a specification for a pre-65 social security claim of any kind are presented, while column 4 presents estimates of an early OAI claim. Beyond the difference in the time period that the dependent variables reference, the findings may differ from those just reported due to SIPP respondent misreports, including mistakes about whether the reported benefit is "primary"(that is, an entitlement arising from the man's own earning record), and because of imputation procedures in the SIPP.

Age-in-sample should be a randomly distributed variable with respect to the administrative variables and it has no explanatory power for these cases, as expected. The effect of the age-62 replacement rate has a still negative but less pronounced effect than that on the SIPP-reported dependent variables.[32] The effect of race on early claims is significant, negative, and quite similar in magnitude to the previous results. Overall, health appears more important in explaining early social security claims when administrative data are used. Its influence is consistently positive, with those in better health much more likely to claim early. The fact that in-sample marital status, particularly having never been married, has no influence on early claims in the administrative record is somewhat surprising, given that these older sample members are presumably fairly unlikely to experience a change from never married.[33] As with the previous findings, college-degree-holder status reduces the probability of an early social security claim of any kind. Unlike the public-use specifications, panel membership/birth cohort has little influence. Men in the 1993 panel (birth year 1929-1931) are less likely to make any early social security claim than those in the 1984 panel (birth year 1920-1922). The

[32] This diminished influence for any early social security claim is not surprising, since the claim may occur at any time prior to age 65, including ages far from age 62.

[33] It is possible that its significant effects on the SIPP-generated dependent variables are due to imputation procedures or secondary beneficiary status (although it seems implausible that this would be a major concern for this sample of older men).

administrative variables do not indicate a cohort trend towards earlier OAI claims, as the public-use data do.

Table 3 presents the findings when SSI-participation and policy variables are included in the specifications for early OAI claims. The coefficient estimates of other model variables are little changed, and they are not reported. The effects of three SSI variables on early OAI claims are examined: an indicator that the SSI application was made subsequent to the 65th birthday; and indicator that both the first application and receipt occurred after the 65th birthday; and a variable indicating whether the household potentially faces an old-age transfer determined by SSI policy at the margin, based on a hypothetical social security benefit that is computed assuming retirement at age 62.

Since the SSI-variable coefficient estimates are quite sensitive with respect to inclusion of the age-62 social security replacement rate, results for specifications with and without this variable are presented. This sensitivity is not surprising, since the SSI variables tend to reflect low lifetime incomes. Since every sample member is qualified for OAI at age 62, the age-62 social security replacement rate reflects much of the variation in lifetime earnings in the sample. The estimated effects of the SSI-variables are always more positive when the replacement rate is included.

The findings in Table 3 are highly sensitive with respect to whether the public-use or administrative information about early social security claims is employed (administrative data are always used to construct the SSI variables). When self-reports of OAI are relied upon, the estimated coefficients for SSI-aged applications and recipiency are large (in the preferred specification that includes the replacement rate) but imprecisely estimated. When complete information on early OAI claims afforded by the administrative data is used, SSI-aged applicants are estimated to be 24% more likely to make an early OAI claim in the preferred specification. The coefficient estimate for actual SSI-aged recipients is similarly large, but imprecisely estimated.

While this evidence overall reinforces earlier *prima facie* evidence that SSI claimants tend to accelerate their OAI claims, the final specification (using the exogenous financial

eligibility variable) fails to provide evidence for the hypothesis that they do so in response to behavioral incentives. The final row of Table 3 presents estimates of the influence of the variable constructed to be an exogenous measure of whether the government old-age transfer is determined at the margin by OAI or SSI rules. The coefficient estimate is negative when the age-62 social security replacement rate is omitted from the specifications, as it also conveys the influence of low lifetime income on early OAI claims. It is insignificant once the age-62 replacement rate is included.

Finally, we note that we also attempted to identify the causal influence of SSI on early OAI claims using an instrumental variables approach. The maximum SSI benefit (which varies by state and filing unit type) was used as an instrumental variable for actual SSI receipt. In linear probability models, no specifications produced significant estimates of the influence of SSI participation on early OAI claims.

VII. Discussion and Conclusions

This paper describes the potential interactions of SSI and social security retirement program rules and has presents evidence on this issue. The theoretical presentation demonstrates that the combined influence of the two programs ought to discourage work and encourage early OAI claims. Using actual SSI participants' social security earnings records, we demonstrate that there is a strong financial incentive to claim OAI early under SSI rules. The design of SSI induces an annual loss in old-age transfer wealth of around 7% when retirement is delayed from age 62 to age 65.

Various analyses of the data reveal that SSI-aged program applicants are likely to claim OAI benefits prior to age 65. SSI-aged participants are much more likely to claim OAI at age 62 than the population at large according to graphical analyses, and regression analyses indicate that SSI-aged applicants are 24% more likely to claim OAI prior to age 65 than men with similar family structure, health status, education, and social security replacement rates, among other factors.

A formal empirical test failed to support the hypothesis that SSI rules *cause* increased early OAI claims. While there are various possible explanations for this result, it is important to note that identifying a group very likely to be financially eligible for SSI may not take one far towards identifying the even smaller group that potentially responds to the program's incentives. For example, while 15% of the final analysis sample is financially eligible for SSI at age 65 (based on their social security earnings records through age 61), only 1% of the sample (about 20 filing units) actually apply to the SSI-aged program by 2000. In fact, our ability to detect the basic relationships between OAI and SSI use at all in a regression framework, given such a small number of relevant observations, appears to be due to our access to very accurate administrative information about program use than is typically unavailable.

While it is plausible that older, impoverished, households claim all public benefits at the first available opportunity, the fact that SSI claims are more dispersed by age for non-OAI eligibles than OAI-eligibles suggests that simple financial need is not the entire explanation. The provision of information about SSI and encouragement to claim it through interactions with SSA may also be an important factor and may put early OAI claimants at an advantage relative to other impoverished households.

Quite aside from behavioral issues, the evidence presented suggests lessons for program design. Welfare systems can unintentionally build in perverse financial penalties when they interact with commonly used programs. While it may be through cleverness or happy accident that many SSI claimants sidestep these penalties to some extent (by claiming OAI early), the elderly poor who either do not understand these complex relationships, or who do not fall into typical patterns of SSI-OAI use, suffer them as a result. Changes in program design that would better integrate SSI and social security, such as giving SSI recipients greater credit for their social security contributions (Burkhauser and Smeeding, 1981) would reduce the SSI-induced differential in the financial terms of delaying retirement. Alternatively, if it is thought desirable for impoverished groups to rely on government transfers in their early 60s, SSA could advise all households with low social security earnings histories of the existence of SSI at that time, rather than waiting for such households to initiate their first OASDI claim.

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Appendix A: Theoretical Model

Model with SSI Participation

Let Y_0 be the amount of old-age pension income that is predetermined at the beginning of period 1. To simplify, assume $Y_0 < D$ (otherwise the worker is automatically ineligible for SSI). In the basic no-saving model, the worker's problem is to choose first-period work (h) and consumption (c_1) to maximize:

$$u(c_1, 1 - h) + \delta v(c_2) \quad .$$

The budget constraint for period 1 is:

(1) $\quad c_1 = wh \quad ,$

where w is the wage in period 1. The pension is given by B(wh), with a positive first derivative. The budget constraint for period 2 depends on whether the individual participates in SSI, and if so whether or not unearned income is below the disregard. The possible old-age budget constraints are:

(2a) $\quad c_2 = Y_0 + G + B(wh)$ if SSI participant and $Y_0 + B(wh) < D$
(2b) $\quad c_2 = G + D$ if SSI participant and $Y_0 + B(wh) > D$
(2c) $\quad c_2 = Y_0 + B(wh)$ if SSI nonparticipant.

Denoting the derivatives of u with respect to its first and second arguments as u_1 and u_2, and the derivative of v as v' (and similarly for second derivatives), the interior local optima corresponding to (2a) and (2c) are characterized by:

(3a) $\quad u_1(wh, 1 - h)w - u_2(wh, 1 - h) + \delta v'(Y_0 + G + B(wh))B'(wh)w = 0$
(3c) $\quad u_1(wh, 1 - h)w - u_2(wh, 1 - h) + \delta v'(Y_0 + B(wh))B'(wh)w = 0 \quad .$

The budget constraint (2b) is horizontal, so that there is no possibility of an interior solution along it. The effects of an increase in G on h along each segment of the budget constraint are obtained by applying the implicit function theorem to the local first-order conditions for the local optima in h:

(4a) $\quad \partial h/\partial G = \{-\delta v''B'(wh)w\}/\{u_{11}w^2 - u_{12}w - u_{21}w + u_{22}$
$\qquad + \delta v''[B'(wh)]^2w^2 + \delta v'B''(wh)w^2\}^{-1} < 0$

(4c) $\quad \partial h/\partial G = 0.$

The first case, while unlikely to arise in practice (because it requires unearned income below the very small $20 disregard), can be easily signed. The numerator is clearly positive under the assumption that pension income increases in earnings and strict concavity of second-period utility, while the denominator is negative under the additional assumption that the first-order condition of the local optimization problem is downward sloping in h, a standard

assumption. Therefore, along each segment of the budget constraint an increase in G either has no effect on hours or causes a decrease in hours.

The global solution is found by choosing the level of h that maximizes utility across the three choices. Optimal SSI participation status is then revealed by the global optimum selected. The budget constraint (2a) is upward sloping, the budget constraint (2b) is horizontal at G + D, and the budget constraint (2c) is upward sloping with the same slope as (2a). An increase in G shifts the budget constraints (2a) and (2b) vertically. This makes it more likely that someone initially on (2c) relocates to the kink point between (2a) and (2b). No one should ever locate on (2b), as it is horizontal. Someone initially at the kink point between (2a) and (2b) may reduce labor supply to the segment (2a). Thus, labor supply is clearly decreasing in G, and it is straightforward but tedious to show, exploiting the first-order conditions and the above information about the change in work hours with respect to G, that the relative value of participation versus nonparticipation is increasing in G.

Model with SSI and SSER Participation

We introduce an SSER policy, characterized by a full retirement benefit B_0, the actuarial reduction β for early retirement, and τ, the implicit tax rate on labor earnings while retired. We assume that the worker must begin receiving social security in the second period, if he has not elected SSER. There are two possible budget constraints for period 1, depending on SSER participation:

(1a) $c_1 = wh$, if no SSER participation
(1b) $c_1 = \beta B_0 + (1 - \tau)wh$, if SSER participation.

In the second period, the possible budget constraints for SSI nonparticipants are:

(2a') $c_2 = Y_0 + B(wh) + B_0$, if SSER nonparticipant
(2b') $c_2 = Y_0 + B(wh) + \beta B_0$, if SSER participant.

Under SSI participation, there are two additional cases, depending on whether income is below the disregard ((2c') and (2d')) or above ((2e') and (2f')):

(2c') $c_2 = Y_0 + G + B(wh) + B_0$, if SSI participant, SSER nonparticipant, and $Y_0 + B(wh) + B_0 < D$
(2d') $c_2 = Y_0 + G + B(wh) + \beta B_0$, if SSI participant, SSER participant, and $Y_0 + B(wh) + \beta B_0 < D$
(2e') $c_2 = G + D$, if SSI participant, SSER nonparticipant, and $Y_0 + B(wh) + B_0 > D$
(2f') $c_2 = G + D$, if SSI participant, SSER participant, and $Y_0 + B(wh) + \beta B_0 > D$.

Since the cases involving being on SSI but below the disregard rarely apply, we ignore them in the following discussion for simplicity.

First, it is evident from the budget constraints that in common situations it will be advantageous to participate in SSER for local optima associated with SSI participation. When a person participates in SSI, the net government transfer is determined at the margin by SSI program rules, so consumption in the second period is G + D regardless of SSER participation. Therefore, SSER participation depends entirely on whether the worker obtains a higher period 1 indifference curve as a consequence. If the worker in the SSER program is not subject to a wage

tax (i.e., the reduction in benefits for earnings above a particular threshold), clearly he is always better off by participating in SSER prior to SSI. This case is highly relevant for the population we study, since given a reasonably generous earnings level before the SSER wage tax sets in, many likely SSI recipients will not be subject to the SSER wage tax. Even for those subject to the 50% wage tax, all those with hypothetical earnings in the absence of policy that are below the value of *twice* the SSER benefit *plus* the entire untaxed earnings allowance in SSER would unambiguously choose to participate in SSER prior to participating in SSI.[34]

In the case where the worker is subject to a wage tax, only for workers who would optimally choose to earn an amount above their SSER benefit in the absence of the SSER program could it possibly be utility-reducing to participate in SSER. But given the disutility of work, this would be the case only for relatively high earners who are unlikely candidates for choosing SSI participation as their global maximum.

[34] To see this, note that accounting for SSER only, income in the absence of SSER is wh, while income with SSER is $\beta B_0 + wh - .5(wh - 9600)$. (This assumes a wage tax of 50%, and that the threshold at which this kicks in is \$9600.) As long as the latter budget constraint is above the former, SSER participation will be chosen. This holds up to the point at which the budget constraints intersect, which is at income of $2 \cdot \beta B_0 + 9{,}600$.

Table 1: Impact of SSI on the Financial Terms of an Early OAI Claim

	Married Men		Single Men	
	without SSI	with SSI	without SSI	with SSI
All Sample Members				
Annualized return to delaying the first OAI claim from 62 to 65	0.048 (0.013)	-0.022 (0.007)	0.050 (0.015)	-0.020 (0.005)
Replacement rates	0.604[a] (0.099)	1.07[b] (0.361)	0.659[a] (0.166)	0.905[b] (0.588)
Top Two-Thirds of Earners				
Annualized return to delaying the first OAI claim from 62 to 65	0.052 (0.014)	-0.024 (0.008)	0.047 (0.015)	-0.023 (0.003)
Replacement rates	0.565[a] (0.095)	0.924[b] (0.353)	0.559[a] (0.081)	0.597[b] (0.144)
Top One-Third of Earners				
Annualized return to delaying the first OAI claim from 62 to 65	0.061 (0.015)	-0.027 (0.010)	0.043 (0.005)	-0.024 (0.002)
Replacement rates	0.516[a] (0.018)	0.710[b] (0.281)	0.487[a] (0.038)	0.475[b] (0.072)

Notes: Sample men from the 1984, 1990-1993, and 1996 SIPPs who match to SSA administrative files on SSI receipt and social security-covered earnings.
[a]Ratio of the filing unit's age-65 social security benefit to total indexed average earnings, appropriately inflated.
[b]Ratio of the filing unit's SSI benefit to total indexed average earnings, appropriately inflated.

Table 2a: Probit Estimates: SSI Receipt and Early Social Security Receipt

	Sample Statistics	OASDI Receipt (SIPP)	SS Retirement Receipt (SIPP)	Early OASDI Receipt	Early OAI Receipt
SSI-aged applicant	0.0110178 0.104	0.119 (0.116)		0.242** (0.121)	
SSI-aged recipient	0.0115425 0.1068		0.172 (0.155)		0.261 (0.164)
Age-62 replacement rate	0.415 (0.100)	-0.512* (0.132)	-0.509** (0.131)	-0.243** (0.119)	-0.229*** (0.119)3
Age is 63	0.328 (0.470)	0.177* (0.031)	0.178* (0.031)	0.032 (0.029)	0.034 (0.029)
Age is 64	0.382 (0.486)	0.275* (0.031)	0.276* (0.031)	0.038 (0.029)	0.040 (0.029)
Race is black	0.077 (0.266)	-0.083*** (0.047)	-0.084*** (0.047)	-0.078*** (0.043)	-0.081*** (0.043)
Health is fair	0.174 (0.379)	0.101** (0.046)	0.102** (0.046)	0.215* (0.042)	0.215* (0.042)
Health is good	0.318 (0.466)	0.082*** 0.042	0.083** 0.0420	0.354* (0.039)	0.354* (0.039)
Health is very good	0.232 (0.422)	0.065 (0.045)	0.065 (0.045)	0.327* (0.042)	0.327* (0.042)
Health is excellent	0.167 (0.373)	0.038 (0.048)	0.038 (0.048)	0.334* (0.045)	0.334* (0.045)
Divorced, widowed or separated	0.127 (0.333)	0.195** (0.094)	0.194** (0.094)	-0.072 (0.089)	-0.072 (0.089)
Never married	0.033 (0.179)	0.191*** (0.109)	0.189*** (0.109)	-0.026 (0.104)	-0.029 (0.104)
State unemployment rate	6.99 (2.21)	0.004 (0.009)	0.004 (0.009)	0.004 (0.008)	0.005 (0.008)
High school graduate only	0.309 (0.462)	0.020 (0.030)	0.020 (0.030)	0.031 (0.029)	0.0298994 0.0287
Some college	0.156 (0.363)	-0.011 (0.037)	-0.011 (0.037)	-0.025 (0.035)	-0.0255986 (0.035)
College graduate	0.192 (0.394)	-0.133* (0.036)	-0.133* (0.036)	-0.094* (0.034)	-0.095* (0.034)
Spouse age	49.304 (22.98)	0.002*** (0.001)	0.002*** (0.001)	-0.001 (0.001)	-0.001 (0.001)

Spouse has 40+ covered quarters	0.663 (0.472)	0.025 (0.027)	0.025 (0.027)	0.003 (0.025)	0.004 (0.025)
1990 panel	0.241 (0.428)	0.099*** (0.051)	0.098*** (0.051)	0.057 (0.048)	0.057 (0.048)
1991 panel	0.159 (0.366)	0.105** (0.047)	0.104** (0.047)	0.066 (0.045)	0.0638807 0.04448
1993 panel	0.196 (0.396)	0.094** (0.046)	0.094** (0.046)	-0.054 (0.042)	-0.054645 (0.042)
1996 panel	0.177 (0.382)	0.126** (0.056)	0.125** (0.056)	0.006 (0.052)	0.004 (0.052)
Social security receipt (SIPP)	0.597 (0.491)				
OAI receipt (SIPP)	0.503 (0.500)				
Early social security (SSA)	0.668 (0.471)				
Early OAI (SSA)	0.652 (0.476)				
SSI-aged applicant (SSA)	0.010 (0.102)				
SSI-aged recipient (SSA)	0.006 (0.079)				
Indicator for "on the SSI budget constraint"	0.152 (0.360)				
Number of observations	1906	1906	1906		1906

Notes: Sample of SIPP men aged 62-64 who are respondent or spouse of respondent. A constant is included in all specifications. Men born after 1932 are dropped from the sample.

Table 2b: Probit Estimates of Early Claims, Social Security Receipt Status from SSA

	Sample Statistics	Early Social Security claim (admin)	Early OAI claim
Age-62 replacement rate	0.415	-0.210***	-.206***
	(0.100)	(0.115)	(0.118)
Age is 63	0.328	0.019	0.034
	(0.470)	(0.028)	(0.029)
Age is 64	0.382	0.036	0.040
	(0.486)	(0.029)	(0.029)
Race is black	0.077	-0.086**	-0.084**
	(0.266)	(0.0419	(0.043)
Health is fair	0.174	0.182*	0.213*
	(0.379)	(0.041)	(0.042)
Health is good	0.318	0.314*	0.352*
	(0.466)	(0.038	(0.039)
Health is very good	0.232	0.276*	0.324*
	(0.422)	(0.041)	(0.041)
Health is excellent	0.167	0.282*	0.332*
	(0.373)	(0.044)	(0.045)
Divorced, widowed or separated	0.127	-0.045	-0.068
	(0.333)	(0.088)	(0.089
Never married	0.033	0.001	-0.027
	(0.179)	(0.102)	(0.1037
State unemployment rate	6.99	0.002	0.005
	(2.21)	(0.008)	(0.008)
High school graduate only	0.309	0.026	0.028
	(0.462)	(0.028	(0.029)
Some college	0.156	-0.027	-0.025
	(0.363)	(0.035)	(0.035)
College graduate	0.192	-0.100*	-0.097*
	(0.394)	(0.033)	(0.034)
Spouse age	49.304	-0.001	-0.001
	(22.98)	(0.001)	(0.001)
Spouse has 40+ covered quarters	0.663	0.006	0.003
	(0.472)	(0.025)	(0.025)
1990 panel		0.050	0.060
	0.241	(0.047)	(0.048)

	(0.428)		
1991 panel	0.159	0.047	0.063
	(0.366)	(0.044)	(0.044)
1993 panel	0.196	-0.083**	-0.053
	(0.396)	(0.042)	(0.042)
1996 panel	0.177	-0.017	0.004
	(0.382)	(0.051)	(0.052)
Social security receipt (SIPP)	0.597		
	(0.491)		
OAI receipt (SIPP)	0.503		
	(0.500)		
Early social security (SSA)	0.668		
	(0.471)		
Early OAI (SSA)	0.652		
	(0.476)		
SSI-aged applicant (SSA)	0.010		
	(0.102)		
SSI-aged recipient (SSA)	0.006		
	(0.079)		
Indicator for "on the SSI budget constraint"	0.152		
	(0.360)		
Number of observations	1906	1906	1906

Notes: Sample of SIPP men aged 62-64 who are respondent or spouse of respondent. A constant is included in all specifications. Men born after 1932 are dropped from the sample.

Table 2: Probit Estimates of Early Claims

	Sample Statistics	Social Security Receipt (SIPP)	OAI (SIPP)	Early Social Security claim (admin)	Early OAI claim
Age-62 replacement rate	0.415	-0.290***	-0.490*	-0.210***	-.206***
	(0.100)	(0.126)	(0.130)	(0.115)	(0.118)
Age is 63	0.328	0.182*	0.177*	0.019	0.034
	(0.470)	(0.030)	(0.031)	(0.028)	(0.029)
Age is 64	0.382	0.265*	0.275*	0.036	0.040
	(0.486)	(0.031)	(0.031)	(0.029)	(0.029)
Race is black	0.077	-0.066	-0.086***	-0.086**	-0.084**
	(0.266)	(0.046)	(0.047)	(0.0419	(0.043)
Health is fair	0.174	-0.113**	0.101**	0.182*	0.213*
	(0.379)	(0.049)	(0.046)	(0.041)	(0.042)
Health is good	0.318	-0.255*	0.081***	0.314*	0.352*
	(0.466)	(0.045)	(0.042)	(0.038	(0.039)
Health is very good	0.232	-0.309*	0.063	0.276*	0.324*
	(0.422)	(0.047)	(0.045)	(0.041)	(0.041)
Health is excellent	0.167	-0.312*	0.037	0.282*	0.332*
	(0.373)	(0.0495	(0.0477	(0.044)	(0.045)
Divorced, widowed or separated	0.127	0.216**	0.197**	-0.045	-0.068
	(0.333)	(0.090	(0.094)	(0.088)	(0.089
Never married	0.033	0.256**	0.190***	0.001	-0.027
	(0.179)	(0.107	(0.109)	(0.102)	(0.1037
State unemployment rate	6.99	0.007	0.0045669	0.002	0.005
	(2.21)	(0.008)	(0.0085	(0.008)	(0.008)
High school graduate only	0.309	-0.000	0.018	0.026	0.028
	(0.462)	(0.030)	(0.030)	(0.028	(0.029)
Some college	0.156	-0.028	-0.011	-0.027	-0.025
	(0.363)	(0.037)	(0.037)	(0.035)	(0.035)
College graduate	0.192	-0.181*	-0.134*	-0.100*	-0.097*
	(0.394)	(0.035)	(0.036)	(0.033)	(0.034)
Spouse age	49.304	0.002***	0.002	-0.001	-0.001
	(22.98)	(0.001)	(0.001)	(0.001)	(0.001)
Spouse has 40+ covered quarters	0.663	0.007	0.024	0.006	0.003
	(0.472)	(0.027)	(0.027)	(0.025)	(0.025)
1990 panel		0.099**	0.101**	0.050	0.060
	0.241	(0.050)	(0.051)	(0.047)	(0.048)

	(0.428)				
1991 panel	0.159	0.094	0.103**	0.047	0.063
	(0.366)	(0.046)	(0.047)	(0.044)	(0.044)
1993 panel	0.196	0.132**	0.095**	-0.083**	-0.053
	(0.396)	(0.055)	(0.046	(0.042)	(0.042)
1996 panel	0.177		0.125**	-0.017	0.004
	(0.382)		(0.055)	(0.051)	(0.052)
Social security receipt (SIPP)	0.597				
	(0.491)				
OAI receipt (SIPP)	0.503				
	(0.500)				
Early social security (SSA)	0.668				
	(0.471)				
Early OAI (SSA)	0.652				
	(0.476)				
SSI-aged applicant (SSA)	0.010				
	(0.102)				
SSI-aged recipient (SSA)	0.006				
	(0.079)				
Indicator for "on the SSI budget constraint"	0.152				
	(0.360)				
Number of observations	1906	1906	1906	1906	1906

Notes: Sample of SIPP men aged 62-64 who are respondent or spouse of respondent. A constant is included in all specifications. Men born after 1932 are dropped from the sample.

Table 3: Probit Estimates of Early Claims, Including SSI Variables

	OAI (SIPP)	OAI (SIPP)	Early OAI claim	Early OAI claim
	Exclude replacement rate	With replacement rate	Without replacement rate	With replacement rate
SSI Variables				
SSI-aged applicant	0.046	0.119	0.208***	0.242**
	(0.114)	(0.116)	(0.121)	(0.122)
SSI-aged recipient	0.093	0.172	0.229	0.261
	(0.153)	(0.154)	(0.164)	(0.164)
Indicator for "facing the SSI budget constraint"	-0.073**	0.017	-0.052***	-0.027
	(0.034)	(0.044)	(0.032)	(0.042)

Figure 1a: Frequency of First SSI Payments and Claims

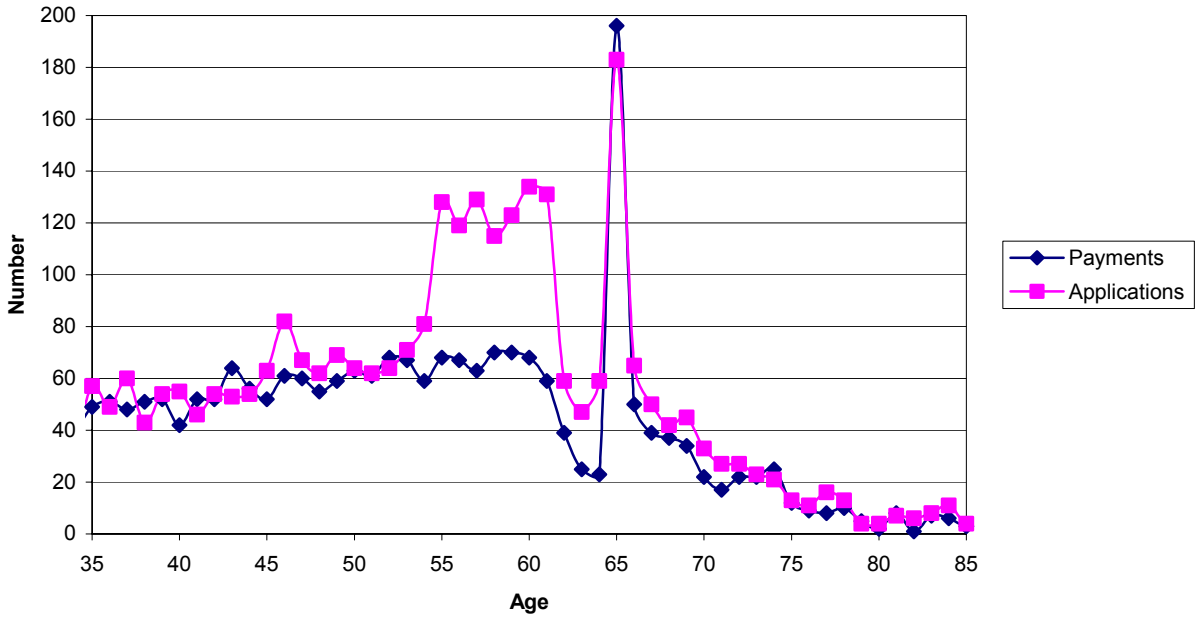
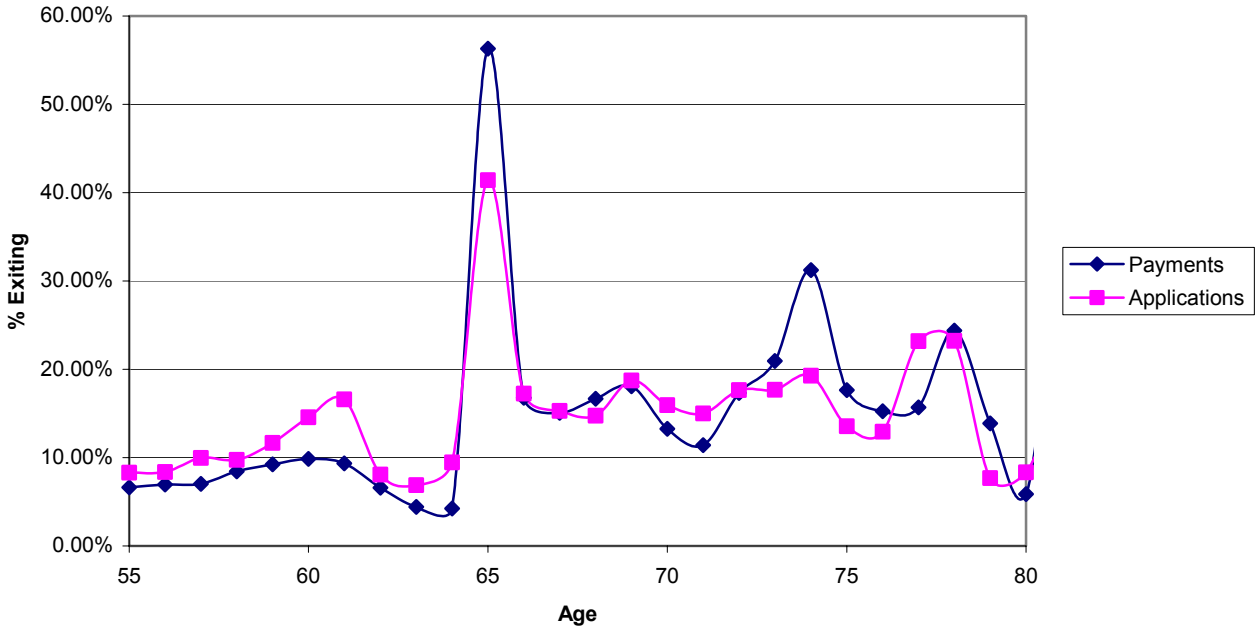


Figure 1b: Hazard Rates, First SSI Claims and Payments



Notes: Source data are men aged 30 or older who are the reference person or spouse of a reference person in the 1984, 1990-1993, and 1996 panels of the SIPP.

Figure 2a: Age at First SSI Payment, SSI-Aged Males, Ineligible for OAI at Age 62

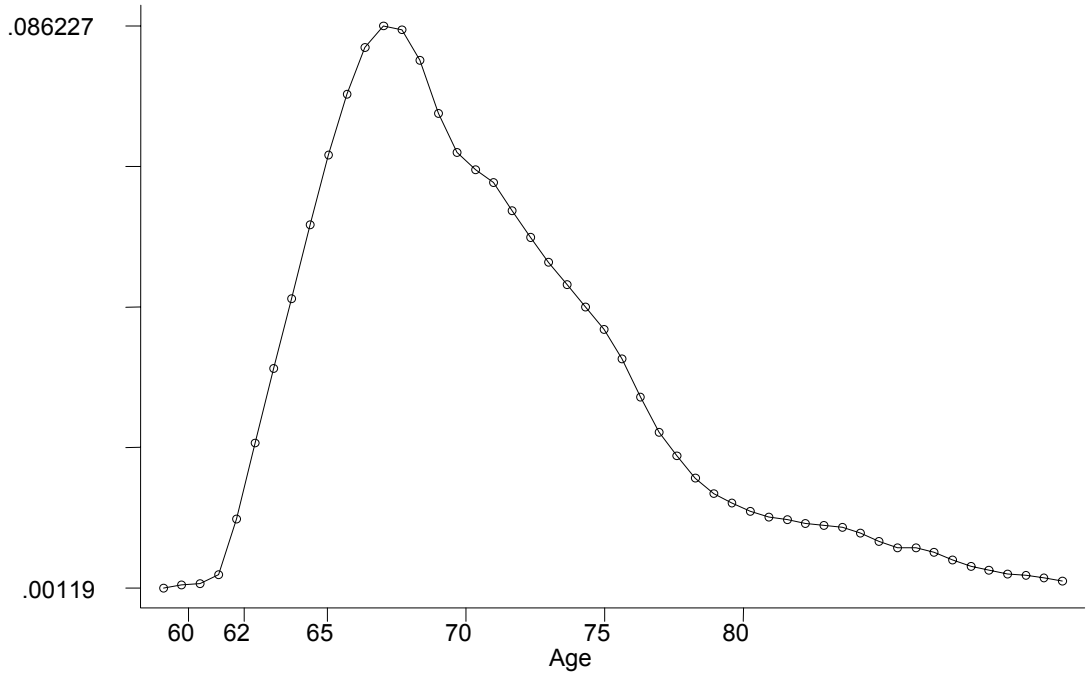


Figure 2b: Age at First SSI Payment, SSI-Aged Males Eligible for OAI at Age 62

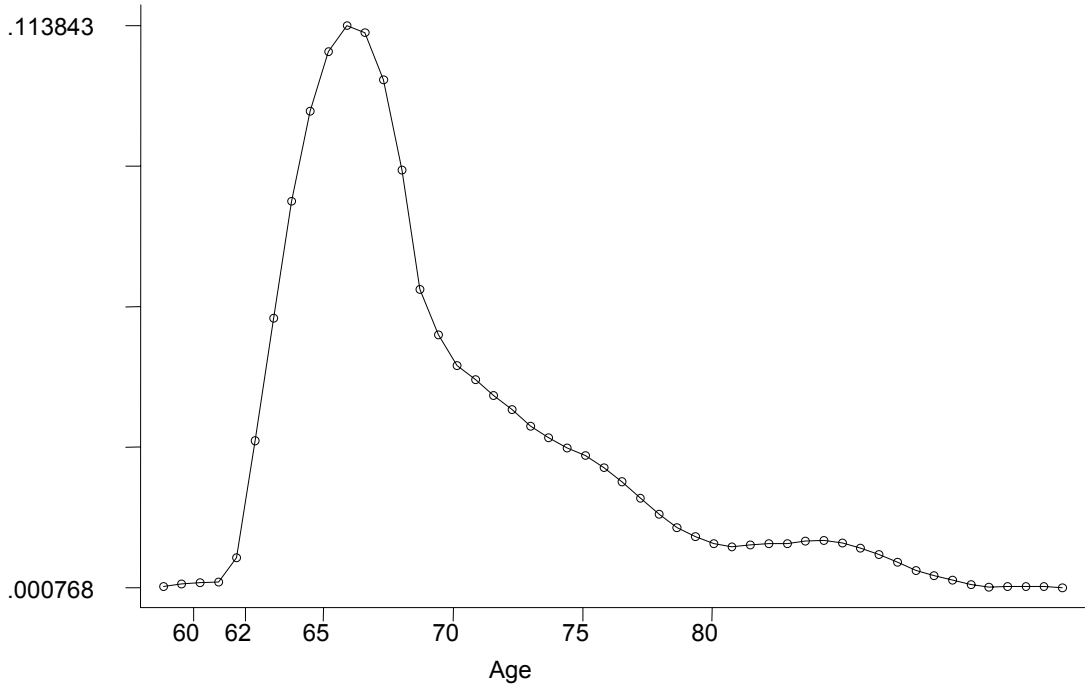


Figure 3a: Age at First OAI Receipt, Low-Education Males

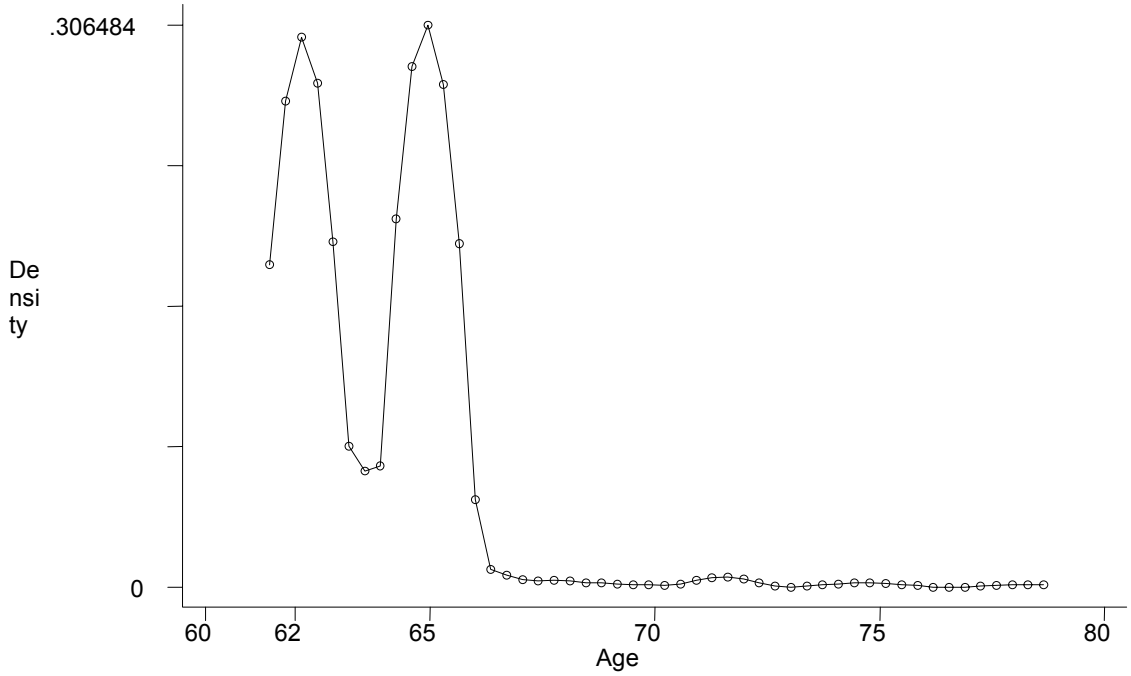


Figure 3b: Age at First OAI Receipt, SSI-Aged Males