The Effect of Social Security (Mis)information on the Labor Supply of Older Americans

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Abstract

Using matched administrative and survey data, this paper examines how older workers adjust their labor supply in response to information they receive about their retirement wealth from the quasi-experimental provision of the Social Security Statement. We find that older workers' labor supply is highly responsive to receiving information about future Social Security benefits, leading to a reduction of 118.9 hours worked per year, on average. However, our estimates point to significant heterogeneity in this response, with workers at the lower end of the hours-worked distribution increasing their labor supply, while those at the high end decrease their labor supply. Additionally, we explore the extent to which the information on the Statement may have led some workers to mistakenly reduce their labor supply due to a lack of understanding of the dynamic nature of the Statement's benefit projections with respect to earnings. We find that among workers who reduced their hours worked in the prior period due to the first Statement receipt, there was an increase in labor supply upon second Statement receipt. Overall, our results point to older workers being very responsive to social security information, which highlights the need to accurately convey this information to workers.

1. Introduction

A central question in economics is how information affects decisions, especially when this information is imperfect. Older workers' retirement behavior is a particularly relevant area in which partial information may lead to sub-optimal decisions, as the incentives embedded in pension plans often are complex and difficult for workers to understand. Indeed, recent evidence points to American workers having rather poor knowledge of their pension and social security wealth levels (Gustman and Stenmeier, 2001; Mastrobuoni, 2011). This lack of information provides a clear role for information-based interventions that can inform workers about their retirement wealth in order to help them make better intertemporal labor supply and private savings decisions. The complexity of many pension systems in general and the social security system in particular makes it very difficult to structure an intervention that provides information that workers will understand. As a result, there is much possibility of giving workers information that is misleading, which can cause optimization errors that render them worse off.

Worker knowledge about retirement wealth and the labor supply incentives embedded in various retirement plans typically is endogenous with respect to labor force attachment. As a result, little currently is known about how workers respond to different types of information about their retirement benefits. In this project, we study the effects of the largest retirement information program in the US, the Social Security Statement, on the labor supply behavior of older workers. To overcome problems associated with the endogeneity of information, we use the differential timing of the Social Security Statement, which was phased in from 1994 to 2000 according to age. The fact that different-aged workers received the Statement in different years allows for exogenous cross-cohort differences in the timing of information. Furthermore, workers receive multiple statements that are staggered over several years depending on their

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birth cohort, which allows us to examine how workers respond to updated Social Security wealth information.

A central motivation of this paper is that the Statement itself provided very limited information to workers: it informed them of their *projected* Social Security monthly benefit at ages 62, Full Retirement Age (FRA), and age 70, assuming constant earnings growth until these ages. As a result, it was difficult if not impossible for workers to use the information contained in the Statement to forecast how changes in their labor supply would impact their future benefits. The information also was presented in such a way that workers may have thought the amount shown was *accumulated* benefits that they would have if they stopped working today (even if they did not claim benefits until 62 or the FRA). This feature highlights the importance of observing worker reactions to subsequent Statements, when they would be able to see how their labor supply changes affected their projected Social Security benefits. That is, we can estimate how workers respond to repeated information about projected retirement levels, and we can use these dynamic responses to determine the extent to which workers may have made errors in their labor supply changes when they received the earlier information.

The introduction of the Statement previously has been used to study the effect of retirement benefit information on retirement wealth information and timing (Mastrobuoni, 2011). The findings indicate that although the Statement increased the accuracy of Social Security benefit predictions, it had no effect, on average, on the timing of Social Security claiming or on the timing of self-reported retirement. This paper successfully demonstrates that the Social Security Statement increased older workers' knowledge of their predicted monthly benefit, given constant earnings. However, the analysis of a binary claiming decision and retirement decision can miss many of the ways in which workers' labor supply responds to information. For one, the

transition to retirement is not binary. Older workers tend to reduce their labor supply quite dramatically on the intensive margin before leaving the labor force altogether, and they also re-enter the labor force after they first leave (Rust and Phelan 1997). Both of these behaviors are not captured by a retirement indicator variable. In addition, there are large spikes at the early and full Social Security retirement ages, which likely are due to the incentives embedded in the Social Security system as well as rule-of-thumb behavior and interactions with other government programs and work rules. The large retirement spikes at these ages make it difficult to observe any impact of an intervention on a binary retirement measure, since so many individuals are not on the decision-making margin.

The first main contribution of this paper is to estimate the effect of Social Security benefit information on a continuous measure of labor supply, rather than examining the binary retirement decision with few marginal decision-makers. Because of the often slow (and non-monotonic) transition from full-time work to full-time retirement, examining direct labor supply measures (such as hours worked) will allow us to analyze in far more detail how labor supply decisions among older workers are influenced by this information intervention. The second contribution of our paper is to examine the dynamic responses of workers to partial Social Security benefit information, i.e. the benefit projections based on *constant* real earnings. That is, does the partial nature of the information provided cause workers to make "mistakes" that are then corrected when the information is updated? To our knowledge, this question has not been addressed by any prior research.

We combine restricted-access Health and Retirement Study (HRS) data that include Social Security earnings histories on workers aged 40-61 with the timing of the rollout of the Statement across birth cohorts. We first estimate the effect of Statement receipt on hours worked.

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Our results indicate that receiving the Statement reduced annual hours worked by 119 hours, which is an 11% reduction relative to mean hours worked. We find much evidence of heterogeneity, however: the hours reductions come mainly from workers aged 55-61, for college-educated workers and for those with a second job. There also are large differences in responses across the distribution of pre-Statement hours worked. Workers who were not working or who worked few hours dramatically increase their labor supply, while there are large declines in hours worked among those who were working full-time prior to Statement receipt. We also show similar patterns exist for self-employment hours and for earnings. In short, our results point to large labor supply responses to receiving a Social Security Statement, which prior work looking at binary retirement indicators has missed.

Given the evidence that Statement receipt leads most workers to reduce their labor supply, we next examine the impact of receiving a second Statement that provides workers with updated information on their projected benefit levels. We hypothesize that some workers may misinterpret the information they receive, such that they think the projected benefit on the Statement represents accumulated wealth, and will erroneously reduce their labor supply. Receiving the second Statement will provide them with information that their Social Security wealth has declined. If this decline was unintended, we then should see these workers increase their hours worked. Thus, we can examine how workers who have similar responses to the first Statement receipt adjust their labor supply when they receive the second Statement to identify the extent to which the first Statement caused workers to make "mistakes." We do this by comparing hours worked among those who exhibit similar changes in labor supply in the prior survey wave that are driven by the initial Statement, only some of whom received their second Statement due to what birth cohort they are in.

Our results point to marked labor supply increases among those who had previously reduced their hours worked and then received a second Statement. For every hour of reduced work due to first Statement receipt, receiving the second Statement leads to 1/3 of an hour increase. We argue this evidence is consistent with workers misunderstanding the information they received and inadvertently reducing their Social Security benefits. As supporting evidence, we show using self-reported expected PIA levels that receiving a Statement leads workers to report that reduced earnings will not lower their Social Security benefits, contrary to what actual accrual rates are for most of them. Thus, our results indicate that the initial Statement provided misleading information to many workers, who then attempting to correct decisions made based on this information when subsequent information became available. For some workers, the confusing nature of the information provided likely made them worse off.

Taken together, the results from this analysis suggest that information about retirement benefits has substantial effects on the labor supply of older, male Americans, whether this information is well-understood or not. Although in 2011, the Social Security Statement was no longer automatically sent out, it is scheduled to be reintroduced in the coming years. Furthermore, workers can request a Statement or can generate the information on the Statement through the Social Security Administration Website. Our analysis sheds light on the essential difficulty of providing clear information without distorting knowledge of the dynamic qualities of pension programs. Specifically, providing a particular point estimate increased accuracy of expected benefits, given the assumptions underlying this estimate, but it appears to have decreased knowledge of how this benefit can vary as a function of labor supply. Given how responsive workers are to this information, much care needs to be taken to ensure the accuracy and transparency of the information.

The structure of the paper is as follows: Section 2 describes essential components of Social Security benefits; Section 3 describes the Social Security Statement and its implementation; Section 4 discusses the data used in this analysis; Section 5 outlines our empirical methodology; Section 6 discusses results; and Section 7 concludes.

2. Old Age, Survivors, and Disability Insurance

Social Security, officially known as Old Age, Survivors, and Disability Insurance (OASDI), provides a suite of potential benefits to individuals who contribute payroll taxes in the US. This program is large: in 2014, total expenditures were $785 billion. Chief among these programs in both saliency and size is the Old Age Insurance (OAI) portion. Because OASDI is a social insurance program, eligibility for benefits and benefit level are both based on one's entire history of covered earnings. OAI in particular requires individuals to have paid into the Social Security system with about 10 years of work for eligibility.[1]

For OAI benefit calculation, the highest 35 years of an individual's annual earnings are used, which are indexed to average national wage growth. An Average Indexed Monthly Earnings (AIME) amount then is calculated. To determine one's Primary Insurance Amount (PIA), or monthly benefit available upon retirement at the Full Retirement Age, the SSA applies a progressive benefit formula to one's AIME. As of 2014, this formula provides a 90% marginal replacement rate for the first $816 of an AIME, a 32% marginal replacement rate for the next $4,917of the AIME, and a 15% marginal replacement rate for any remaining earnings. Hence one's benefit is always increasing in previous earnings, although at a decreasing rate. This PIA is then reduced if one opts for early retirement, available starting at age 62, or is increased if one delays collecting benefits after the Full Retirement Age, currently at 66.

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[1] Specifically, the requirement to be insured is 40 Quarters of Coverage (QC), where in 2014 a QC is earned for every $1,200 of earnings, up to 4 per year.

Although a full discussion of program details is outside of the scope of this paper, a few points are relevant to the analysis below: if a potential retiree does not have 35 years of earnings in his work history, then his AIME will contain zero earnings years. Because most individuals are earning at their highest levels late in their careers, there can be large returns to work among older workers when these higher earnings years replace the zero or low earnings years (Coile et al. 2002). The extent to which these high accrual rates apply depends on a worker's earnings history, and thus workers with similar current income levels may have vastly different returns to remaining in the labor force.

Additionally, individuals can collect benefits based on their spouses' work history, generally limited to 50% of their spouses' PIAs. Since we focus on older Americans in the 1990s in this sample, we limit our analysis to men largely to avoid the complex incentives facing women who may be deciding whether to collect benefits based on their husbands' work histories or their own. Because men have been shown to be largely unresponsive to the impact of their own claiming behavior on spousal benefits (Sass et al. 2007), our sample represents individuals responding to their own retirement benefits.

A large literature measures the effects that the various components of the Social Security system have on labor supply, largely through changes in the parameters or scope of these components (e.g., Krueger and Pischke 1992, Friedberg 2000, Duggan et al. 2007, Mastrobuoni 2009). For a thorough discussion of decision-making and OAI more generally, Krueger and Meyer (2002) provide a comprehensive survey of studies that model retirement behavior.

Most papers in this literature either implicitly or explicitly assume that workers know their future benefits and can accurately weigh alternative income streams when making labor supply and benefit collection decisions. Survey-based evidence, however, suggests that such

sophisticated decision-making is rare. In the HRS, a sample of older Americans approaching retirement, only about 50% of respondents are able to provide any estimate of their expected Social Security benefits. Fewer than 30% of respondents are able to estimate their future benefits to within $1,500 (in 2000 dollars) per year (Gustman and Steinmeier 2001). These results suggest it is a very strong assumption that these respondents are not only aware of the range of complex retirement incentives they face but that they also factor these incentives into their decision-making years in advance. Chan and Stevens (2008) estimate that the literature finding of responsiveness to pension incentives is driven entirely by the 20% of workers who correctly perceive these incentives.

At the same time, behavior entirely inconsistent with these incentives obtains among a substantial portion of the population. For example, family members for whom it is more advantageous to delay collecting spousal benefits after their own labor force exit are more likely to instead immediately collect benefits. Conversely, unmarried men who should immediately collect retirement benefits after exiting the labor force are more likely to delay collection (Gustman and Steinmeier 2000a).

More recent research has found that a majority of 50- to 70-year-olds understand future Social Security benefits are linked to one's participation in the labor force on the extensive margin. These individuals also largely understand the incentives behind the delayed retirement credits and widow benefits (Liebman and Luttmer 2012).[2] However, there are still aspects of the Social Security system about which individuals have a poor understanding, such as which and how many years of earnings are used in benefit calculations that impact intensive margin

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[2] It is important to note that the evidence in Liebman and Luttmer (2012) comes from a survey they conducted in 2008, when their sample would have been comprised of individuals who had received the Statement for at least 8 consecutive years. At this time, most workers would have received yearly Statements for several years, which may have increased their knowledge about their benefits and the incentives embedded in the Social Security System.

incentives. Moreover, individuals' ability to operationalize this knowledge is unclear, or at least incomplete. While these same authors found that a field experiment designed to increase knowledge about Social Security benefits and the incentives embedded in the benefit formula increased labor force participation by 4 percentage points, or over 5% (Liebman and Luttmer forthcoming), the effects were limited to females and there was no evidence of an impact on intensive margin labor supply. The intervention we study differs from theirs most notably in the fact that they did not provide any information about participants' Social Security wealth to them. They only provided information about Social Security program provisions, not individual-specific benefit projections, in contrast to what the Social Security Statement showed. Thus, responses to the two types of information may be quite different.

Unfortunately, beyond this recent field experiment, understanding the effect of improving knowledge of these incentives has been largely stymied by a lack of exogeneity in the provision of information. Cross-sectional variation in program knowledge can be highly correlated with the benefits themselves and/or with labor force attachment. The staggered introduction of the Social Security Statement across birth cohorts produced the type of exogenous variation in knowledge needed to analyze labor supply responses to projected Social Security benefit information.

3. The Social Security Statement

Starting in 1990, the Social Security Administration began providing standardized benefit statements for all individuals who requested them, and starting in late 1994, Statements were automatically sent out. These Social Security Statements eventually were sent annually to all individuals 25 and older between 2000 and 2011 who ever paid payroll tax. They contained personalized information about OASDI benefits upon retirement, disability, or death. Appendix Figure A-1 contains a fictional example Statement provided by the SSA. In addition to providing

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information on these benefits, the Statement also displays each worker's historical covered earnings, allowing for a Statement recipient to check whether SSA has a correct record of his or her earnings history.

The Statement describes projected retirement benefit levels if a retiree elects to receive benefits at the Early Eligibility Age (62), the Full Retirement Age (between 65 and 67, depending on birth cohort), and age 70. To construct the benefit information, the SSA uses each individual's lifetime of earnings up to the calendar year before the Statement's release. However, the SSA also includes expected future earnings up to the three ages (62, Normal Retirement Age, and 70) listed on the Statement. These expected future earnings assumes the individual will earn the last calendar year's earnings until collecting retirement benefits, with zero real wage growth (or decline), both nationally and individually.

Although there can be much debate over whether these assumptions are realistic or individually applicable, more concerning is whether individuals even understand that these retirement benefits are based on continued similar earnings. As Figure A-1 demonstrates, it was not possible to use the information on the Statement to project what might happen to benefits due to a given change in labor supply. However, it is unclear whether individuals knew that any large change in labor supply could lead to a large change in projected benefits. This is particularly the case if workers believed the benefit levels shown were already accrued, in which case they might think reductions in labor supply would not reduce their Social Security benefits. Indeed, some researchers have expressed concern that the static nature of these estimates is misleading, and conveying information on Social Security wealth accrual rates by different earnings trajectories would be more relevant to the decision-making of potential beneficiaries (Jackson 2006). This

concern over the way in which this information was provided is a central motivation for our paper.

While the Statement has, until recently, been sent to those 25 and older, it was phased in across different age groups in the late 1990s. The Statement was initially sent out to those age 60 and over in 1995, as well as all those turning 60 from 1995 onward. Additionally, in 1996, they were automatically sent to those age 58 to 60; in 1997, 53 to 58; in 1998, 47 to 53; in 1999, 40 to 47; and in 2000, 25 and over.[3] Figure 1 illustrates which age groups received the Statement in which fiscal year, as well as the total number of Statements sent out. An "X" in an age group by year cell indicates that a Statement was sent to that age group in that year. This phase-in schedule provides a natural experiment in the provision of information about OASDI benefits in the late 1990s. As evident in Figure 1, there is variation by year and age in both first Statement receipt as well as in the timing of when individuals received the Statement a second time. As discussed above, the lack of information on how different earnings trajectories might affect benefit levels makes the second Statement receipt the main way workers could determine how their labor supply responses to the first Statement affected their Social Security wealth.

To provide a clearer illustration of the variation in both first and second Statement receipt that we exploit in our analysis, Figure 2 shows the Statement receipt patterns of five adjacent birth cohorts from 1994 to 2001.[4] These cohorts form an illustrative subset of our analysis cohorts. The shadings in each column allow one to track each cohort across columns to see the timing of first and second Statement receipt. Three of these cohorts (1936-1938) received their

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[3] The years described here correspond to SSA fiscal years, which start in October. The exact timing of Statement receipt depends on one's birth month, but approximately one third of those 60 and over received a Statement in 1994: those born in October, November, or December 1994 or in January 1995.

[4] We include only men under the age of 62 in our analysis to avoid complex interactions with those who may already have claimed benefits.

first Statement in 1996, while the younger two cohorts had to wait until 1997. Second Statement receipt patterns are even more disparate: we do not see the 1936 birth cohort receive a second Statement before age 62, the 1937 birth cohort receives a second Statement in the year directly after first receipt, both the 1938 and 1939 birth cohorts receive a second Statement two years after first receipt (although separated by one year from each other), and the 1940 birth cohort received their first Statement in the same year as the 1939 cohort but must wait three years before its second Statement receipt. It is this substantial variation in both first and second Statement receipt that allows for the identification of the effect of the Statement separate from age and year fixed effects. We exploit the fact that otherwise similar cohorts have different Statement receipt patterns to identify the causal effect of the Statement information on labor supply of older workers.

Previous research on this Statement has shown that once one controls for age and year, no other factors influence Statement receipt, and that after having received these Statements, individuals are much more likely to be able to provide any estimate of their OAI benefits (Biggs 2010; Mastrobuoni 2011). Among those who already provided estimates, the accuracy of these estimates improves. However, in the only prior analysis of worker retirement effects of the Statement, Mastrobuoni (2011) found no average change in timing of collecting Old Age Insurance benefits. He also did not find any evidence that the Statement caused workers to be more sensitive to variation in their Social Security wealth with respect to the timing of benefit claiming. To date, there has been no direct analysis of the Statement's effect on labor supply of older Americans, though, which is the focus of this paper.

Data

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This paper uses restricted-use Health and Retirement Study panels that are matched to Social Security earnings and benefits records. The HRS is a nationally-representative panel survey of individuals over age 50 and their spouses. The survey elicits information about demographics, income, assets, health, cognition, job status and history, expectations, and insurance. It consists of six cohorts:

1) Initial HRS cohort: born between 1931 and 1941, first interviewed in 1992 and re-interviewed every 2 years;

2) AHEAD cohort: born before 1924, initially the separate Study of Assets and Health Dynamics Among the Oldest Old, first interviewed in 1993, then in 1995, 1998, and subsequently every two years;

3) Children of Depression (CODA) cohort: born 1924 to 1930, first interviewed in 1998 and subsequently every two years;

4) War Baby (WB) cohort: born 1942 to 1947, first interviewed in 1998 and subsequently every two years;

5) Early Baby Boomer (EBB) cohort: born 1948 to 1953, first interviewed in 2004;

6) Mid Baby Boomer (MBB) cohort: born 1954-1959, first interviewed in 2010.

For this analysis, we use men in the first four cohorts only, since the fifth and sixth cohorts enter after the Statement had been universally provided to those 25 and older. Thus, the last year covered in our sample is 2002 (corresponding to wave 6 of the survey). These panels are then matched to Social Security Respondent Cross-Year Summary Earnings, for which the match rate is approximately 72% among the cohorts we use and 66% overall for the Initial Cohort (Mitchell et al. 1996). These records provide earnings from 1951 to the year of the match. The match is imperfect due to two factors: approximately a quarter of respondents do not grant permission to

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have their administrative records matched, and several individuals provided erroneous Social Security Numbers. Previous research using these matched data shows that for the Initial Cohort, the matched subset is an unbiased subsample (Kapetyn 2006, Michaud 2008).

The largest problem when using the matched data is that the Social Security records are matched only up until a permission year, and for the vast majority of respondents in our sample there are only three permission years: 1992, 2004, and 2008. In a permission year, an HRS respondent is asked again whether the survey administrators can match his or her SSA records up until that year. Therefore, an individual must stay in the HRS until 2004 for researchers to observe his or her records past 1992. These individuals represent a skewed sample of younger and healthier respondents. We therefore primarily use self-reported measures of earnings and hours worked instead of relying on administrative records post-1992.

We focus our analysis on men for two reasons. First, for this population of older workers, labor force participation rates of men are much higher than among women, and men represent the primary earners in their families. Second, because of their higher lifetime earnings, their Social Security Statement will be informative as to their retirement benefits, while their wives will be much more likely to collect spousal benefits. We further limit our analysis to men under age 62, thereby avoiding the complex incentives facing someone who can choose to receive benefits immediately and for whom the Statement has different informational content. In effect, we are focusing only on men who can change their labor supply in *anticipation* of future Social Security benefits.

Using the SSA-matched data, we calculate whether individuals have earned the 40 Quarters of Coverage in their lifetime to be fully insured for OAI. We drop individuals who are not fully insured by 1991. Although they may subsequently work enough to gain OAI eligibility,

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their benefits will be very low and they represent an unusual sample of workers. Additionally, we drop those cohorts that were included in the HRS after they received their first Statement because for these workers we cannot measure pre-Statement labor supply. Table 1 shows the effect of these sample restrictions on the size of our primary sample. While the sample is reduced significantly from its original size, most of the reductions come from the sample restrictions related to the years of observation we consider, the age of respondents, the gender of respondents, and the HRS cohorts we analyze. Ultimately, there are 21,094 observations corresponding to 4,038 unique respondents in our analysis sample.

For variable construction, we draw from the RAND Corporation's pre-cleaned version of the HRS for self-reported earnings, hours worked, self-employment status, analytic weights, health status, IRA wealth, general assets not including IRAs, and pension information. We use the HRS Tracker File for marriage status, birth and death information, and education. Last, we use HRS modules for expected OAI benefits at age 62 or 65. We calculate whether an individual had a second job before any Statement receipt, as well as the number of hours they worked in the year before the first Statement receipt. Tables 2a, 2b, and 2c provide descriptive statistics of the variables we use in our analysis.

Finally, our primary analysis uses the HRS as a natural sample, as is common practice in the Social Security program analysis literature using the HRS (Burkhauser et al. 2004, Li and Maestas 2008, Mastrobuoni 2011). The primary reason for this decision is that the weights are not available in all years, and thus using them distorts the age composition of the sample. As a check on our results, weighted versions of all regressions are included in corresponding Appendix tables and show our estimates and conclusions are robust to using sample weights.

4. Empirical Methodology

4.1. Effect of Statement Receipt on Labor Supply

Our goal in this analysis is to estimate the effect of Statement receipt on the labor supply of older male workers. To estimate this relationship, we employ difference-in-difference models that examine how labor supply of men in different cohorts changes when they receive a Statement. The baseline difference-in-difference model is:

$$HRS_{iat} = \alpha + \beta SSS_{iat} + X_{it}\theta + \sum_{j=1}^{6} \gamma_j HRS_{iatj}^{pre} + \delta_a + \rho_t + \varepsilon_{it} \qquad (1)$$

where HRS_{iat} represents annual hours worked of worker i, of age a in year t, be it hours-worked across all jobs or self-employed hours-worked. The variable SSS_{iat} is an indicator for whether an individual has received a Social Security Statement by year t. The vector X_{it} is a set of demographic factors shown in Table 2a that include marital status, education and race, and the model includes age fixed effects (δ_a), year fixed effects (ρ_t).

We control for pre-Statement hours worked by including a set of six indicator variables (HRS_j^{pre}) for whether an individual worked 1-9, 10-19, 20-29, 30-39, exactly 40, or over 40 hours per week in the survey wave immediately prior to first Statement receipt. The omitted category is workers who had zero hours of work prior to Statement receipt. These pre-treatment labor supply controls serve two functions. First, they control for any heterogeneity across workers in pre-existing labor supply levels that may be correlated with the timing of the Statement rollout. Second, changes in labor supply can be influenced by mean reversion, since both low-hours workers and high-hours workers will naturally tend to revert to the mean. Controlling for pre-treatment labor supply accounts for this mean reversion, and so we can identify whether workers in each hours group exhibit differential changes in labor supply when they receive the Statement relative to workers who work the same number of hours and who did not receive the Statement.

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The main parameter of interest in equation (1) is β, which conditional on the controls in the model estimates the average change in labor supply from the pre-Statement level when a worker receives a Statement compared to a worker who has not yet received a Statement.[5] There are two main assumptions under which equation (1) allows us to identify the causal effect of Statement receipt on hours worked. First, the timing of Statement rollout must be unrelated to cross-cohort secular trends in labor supply, conditional on age and calendar year. If there are cohort-specific trends in hours worked that happen to be correlated with the timing of Statement rollout, this would bias our estimates. We believe such a situation is unlikely given the idiosyncratic variation in both first and second Statement receipt timing illustrated in Figure 2. Indeed, Mastrobuoni (2011) shows that conditional on controlling for age and year, no other observable factor predicts Statement receipt. Nonetheless, we test directly for selection on fixed trends by including a lead of Statement receipt. If Statement rollout is correlated with cohort-specific trends in hours worked, this lead variable will be large and statistically significant. However, we estimate a precise coefficient close to zero, which supports our main identification assumption.

The second identifying assumption is that there are no cohort-specific shocks that are correlated with the timing of Statement rollout. We do not find it very plausible that such systematic shocks would exist, as the Statement rollout allows us to separately control for year effects and age effects separately from any effect of the Statement. In short, the time-varying nature of Statement receipt makes it unlikely there were other factors that influenced the relative labor supply of cohorts in a way that was correlated with Statement receipt. In particular, we are

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[5] Note that all workers in our sample eventually receive a Statement, so the control group in our difference-in-difference model is comprised entirely of individuals who have not yet received a Statement but who will receive one in the future.

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aware of no labor market policies that would have differentially affected these cohorts and that

was rolled out contemporaneously with the Social Security Statement.

Equation (1) estimates the average effect of having received a Statement on labor supply.

This average effect, however, might mask substantial heterogeneity across subgroups in

responsiveness to the Statement that is of high interest. Thus, we examine heterogeneity along

several dimensions: age, educational attainment, whether the respondent has a second job,

whether the respondent has received a second statement, and pre-Statement hours worked.

Because each of these sources heterogeneity either are determined prior to Statement receipt or

are not malleable (e.g., age), these interactions do not pose additional identification concerns.

Other potentially important sources of heterogeneity in worker responses to information

are the extent to which they have large or small pension returns to working and/or non-Social

Security wealth. In order to account for heterogeneity in Social Security incentives for

continuing to work, for each person-year, we construct a measure of the one-year Social Security

retirement benefit return to work. This is done by calculating the present discounted value of the

older worker's PIA (i.e. Old Age Insurance benefit collected at the Full Retirement Age) if he

stopped working now compared to working one additional year at the same earnings level, with

this benefit collected from the FRA onward.[6]

Although much research in the pension literature (Stock and Wise 1990, Samwick and

Wise 2003; Coile and Gruber 2007) has emphasized that the one-year accrual rate does not

measure optimal retirement timing, in this context it provides a straightforward measure of the

returns to additional work among potential Social Security beneficiaries. Its accuracy stems

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[6] Survival probabilities were taken from the 1995 OASDI Trustees Report Lifetables, and future payments were
discounted to the current age with a discount rate of 3%. Both these mortality risks and this discount rate were used
by Coile and Gruber (2001) in their analysis of the worker responses to Social Security work incentives.

from the relatively monotonic nature of OASDI, especially when looking at workers under the age of 62 and the assumption of an additional year of earnings. Given our analytic design – examining the labor supply change from one interview to the next – this accrual rate provides a strong measure of the relative gains from continued labor supply for men under the age of 62 embedded in the Social Security system.[7]

In addition to the Social Security returns to work embedded in the one-year accrual rate, we create four measures of wealth: (1) self-reported non-pension wealth from all sources, including housing, liquid assets, vehicles, IRAs, etc.; (2) the prior definition plus current self-reported balances in defined contribution pension plans; (3) the prior definition plus the value of Social Security retirement and private pension benefits based on work up until the current year, discounted to the current year; and (4) Social Security Wealth as measured by the AIME each worker has accrued up until the current calender year.[8] We examine how workers respond to Statement receipt by each of these wealth levels as well as by the one-year OAI accrual rate. We hypothesize that, all else equal, wealthier workers will be less responsive to information and workers with high accrual rates will be more responsive.

4.2. Dynamic Effect of Second Statement Receipt on Labor Supply

The second part of this analysis examines how workers respond to multiple doses of information. The thought experiment underlying our approach is to consider two, otherwise identical, workers who have received one Statement and who reduced their labor supply in the previous wave. One of these workers then receives a second Statement, while the other worker

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[7] Although Coile and Gruber (2001) rightly include auxiliary benefits (spousal and survivors) in their approach to finding optimal retirement timing, recent empirical evidence has suggested that male workers incorporate only their own retirement benefits into their decision-making vis-à-vis Social Security (Sass et al. 2007, Henriques 2012), and if they do include spousal or survivors benefits, they place little weight on it in their decisions (Knapp 2013).
[8] Measures (2) and (3) come directly from the latest HRS Imputations for Pension Wealth (V2.0) release set (ImpPenW), as variables PV_DB and DBXP.

does not. Our goal is to understand how the labor supply of the worker who received the second

Statement changed with respect to the worker who did not.

The test we seek to undertake in this part of the analysis is whether there are workers who

reduce their labor supply in response to receiving the first statement who then increase their

labor supply when they receive the second statement. Setting *w* as the current survey wave, we

estimate whether those who reduced their hours worked between *w-2* and *w-1* and who received

a second statement between *w-1* and *w* increased their labor supply relative to those who

decreased their labor supply over the same period but did not receive a second statement.

Because lagged changes in labor supply are endogenous with respect to current labor supply, we

instrument changes in labor supply between *w-2* and *w-1* with first statement receipt. Our sample

is the set of respondent-wave observations that have received no statements by *w-2* and have

received at most one statement by *w-1*. We then estimate the following two-stage least squares

model:

$$
\begin{aligned}
HRS_{iawt} = \alpha + \ X_{iwt}\theta + \delta_a + \rho_t \ + \gamma HRS_{iat}^{pre} + \beta_1 \Delta Hours_{i,w-2,w-1} + \ \beta_2 \Delta Hours_{i,w-2,w-1} \\
* \ First\ Statement_{iw} + \beta_3 \Delta Hours_{i,w-2,w-1} * Second\ Statement_{iw} + \epsilon_{iawt}
\end{aligned}
$$

$$
\Delta Hours_{iw-2,w-1} = \ \alpha + \ X_{iwt}\theta + \delta_a + \rho_t \ + \sum_{j=1}^{6} \gamma_j HRS_{iatj}^{pre} \tag{2}
$$

$$
+ \sum_{j=1}^{6} \tau_j HRS_{iatj}^{pre} * First\_Statement_{i,w-1} + \mu_{iawt}
$$

$$
\Delta Hours_{iw-2,w-1} * First\ Statement_{iw-1} = \ \alpha + \ X_{iwt}\theta + \delta_a + \rho_t \ + \sum_{j=1}^{6} \gamma_j HRS_{iatj}^{pre}
$$

$$
+ \sum_{j=1}^{6} \tau_j HRS_{iatj}^{pre} * First\_Statement_{i,w-1} * First\ Statement_{iw} + \mu_{iawt}
$$

$$\Delta Hours_{iw-2,w-1} * Second\ Statement_{iw-1} = \alpha + X_{iwt}\theta + \delta_a + \rho_t + \sum_{j=1}^{6} \gamma_j HRS_{iatj}^{pre}$$

$$+ \sum_{j=1}^{6} \tau_j HRS_{iatj}^{pre} * First\_Statement_{i,w-1} * Second\ Statement_{iw} + \mu_{iawt}$$

where $\Delta Hours_{i,w-2,w-1}$ is the change in hours between waves *w-2* and *w-1*,

$First\ Statement_{iw-1}$ is an indicator variable equal to 1 if the respondent had received the first

statement by wave *w-1*, and $Second\ Statement_{iw}$ indicates whether the respondent received the

second statement by the current wave (*w*). All other variables are as previously defined.

The first stage in this model is essentially equation (1), where we interact first statement

receipt with pre-Statement hours of work.[9] However, the sample differs somewhat from the one

used to estimate the results in Table 4 due to the imposition that all respondent-waves not have

received a statement as of *w-2*. As a result, the first-stage estimates do not match those in

Column (7) of Table 4 exactly. The coefficient of interest in the IV model is β_3, which shows the

difference in hours worked between those who have and have not received a second Statement

but who have similar lagged hour changes due to having received their first Statement.

The identification assumptions underlying this IV approach are virtually identical to

those underlying identification of equation (1): the rollout of the statements needs to be

uncorrelated with cross-cohort secular trends in labor supply. Here, we invoke this assumption

both for the first and second Statements. Because we are interested in wave-to-wave changes in

labor supply, it is important to account for mean reversion in our model. Those with large prior

declines in labor supply may naturally increase labor supply in the current period (and vice

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[9] Because our sample is those who have not received a Statement by wave *w-2*, pre-Statement hours of work comes from wave *w-2* for all observations.

versa). The variable $\Delta Hours_{i,w-2,w-1}$ controls for mean reversion in equation (2), as it specifies the pre-Statement relationship between lagged hours changes and current hours. We then examine how any pre-existing relationship between $\Delta Hours_{i,w-2,w-1}$ and current hours changes when an individual receives the second Statement.

Another potential concern with our approach to identify how labor supply responds to updated information is that the change in projected Social Security benefits is highly dependent on one's work history. Social Security retirement benefits are based on the highest 35 years of a worker's earnings, and therefore there is a natural limit to the amount these benefits can change by just one additional year of work. However, the Social Security Statement uses the most recent full year's earnings as the basis of projected earnings for *every year* from the Statement's construction to the listed benefit collection date. Therefore, changes in current earnings can have immediate and large impacts on the Statement's benefit projection. For example, if a 50-year-old, earning at the highest level of his career, plans on retiring at the Late Retirement Age of 70 after seeing his Statement and decides to go to part time work earning half as much, then a Statement issued the very next year will use 19 years (of 35 computation years) with this new lower earnings rate. This new Statement will show a substantially lower projected benefit, even after just one year of lower labor supply, and the now 51-year-old may be surprised at how much his benefit has dropped.

In order to demonstrate the degree and rapidity with which these projected benefits can fall, we construct a counterfactual Statement in each year with benefit projections not based on current earnings, but instead either no earnings or half the current earnings level. Table 3 shows the percentage fall in the projected Social Security retirement benefit at the FRA if an individual who just received his first Statement either stopped working or halved his earnings. As is clear,

even among an older population, almost all workers would experience a large decline in projected benefits. Thus, there is much scope for declines in hours worked to affect projected PIA levels and worker behavior, which is the motivation behind estimating equation (2).

5. Results

5.1. Effect of Statement Receipt on Hours Worked

5.1.1. Baseline Estimates

The main results from estimation of equation (1) for the sample of men aged 40-61 are shown in Table 4. In the table, each column presents results from a separate regression, and all estimates are accompanied by standard errors that are two-way clustered at the survey year and birth year levels (Cameron, Gelbach and Miller 2011). In the first column, we show estimates that include all demographic controls as well as age and year fixed effects and controls for pre-Statement labor supply. Column (1) shows that Statement receipt reduces the amount of hours worked by 118.9 hours. This is an 11% decline relative to the mean hours worked of 1065.3 shown in Table 2a. Thus, Statement receipt has a large, negative effect on hours worked, even if it does not affect the timing of when people report being "retired" as shown in Mastrobuoni (2011).

As discussed in Section 5, a core concern with our difference-in-difference design is that the Statement rollout is correlated with cohort-specific trends in labor supply. To test for selection on fixed trends, we include an indicator for whether the respondent will receive a Statement by the next survey wave in column (2). The coefficient on the *Leading Statement* variable is small, precisely estimated, and is not statistically significantly different from zero at conventional levels. Furthermore, including this variable does not change the estimate on the

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Statement variable. Thus, there is no evidence of cohort-specific labor supply trends that are correlated with Statement rollout, which supports the validity of our estimation strategy.

There is much reason to believe that the effects of Statement receipt will differ across age groups. In fact, if workers correctly understand the Statement information, younger workers should not react at all to the information, as their PIA will be highly sensitive to hours worked over the remainder of their careers. If anything, we would expect there to be a positive effect among younger workers who are worried that their current PIA is insufficient for their expected retirement plans. Older workers, however, are more likely to reduce their labor supply if the Statement provides information that their Social Security Wealth is high enough to fund their retirement. This is exactly the pattern we observe in Column (3) of Table 4, in which we allow the effect of the Statement receipt to vary by worker age. The estimates for workers in their 40s and early 50s are positive, although they are not statistically different from zero at conventional levels. Workers aged 55-61, however, significantly reduce their labor supply when they receive a Statement, and the estimates are much larger in absolute value for the 60-61 year old workers. These results strongly suggest that older workers are more responsive to retirement information.

In columns (4) and (5), we examine whether there are heterogeneous responses by worker education level and by whether a worker has a second job before the first statement receipt, respectively. We find no strong evidence of heterogeneous treatment effects with respect to education: those with graduate training are the most responsive, but high school graduates also reduce labor supply significantly when they receive a Statement. The point estimates are negative and sizable for each education group as well. In column (5), however, the results point to the largest effects of the Statement among those with a second job. Such workers experience a 549 hour reduction in hours worked, while those with only one job reduce yearly labor supply by

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only 79 hours. This heterogeneity likely is driven by the fact that those with two jobs have much more flexibility in hours than those with one primary job. Predictably, worker flexibility in the ability to adjust hours worked without leaving their primary job leads to larger treatment effects.

Workers also are highly sensitive to receiving multiple doses of information. In Column (6), we show a large, negative average effect of the second Statement receipt as well as the first receipt. As we will explore below, this average negative effect may hide substantial heterogeneity with respect to the type of information about projected benefits that is contained in the second Statement.

Finally in Table 4, we estimate whether workers respond differentially to receiving a Social Security Statement according to their pre-receipt hours of work. The results, shown in column (7), show a large amount of heterogeneity. Those who were previously not working and with low hours of work increase their hours worked, and those working full time (i.e., 40 hours per week or more) reduce their labor supply substantially. Among those who were previously not working (31% of the sample), there is an increase in hours worked of 474 hours, and for those who worked under 10 hours (1.3% of the sample) labor supply increased by 584 hours due to Statement receipt. The effect then decreases monotonically as pre-Statement work hours increase. For those working exactly 40 hours a week (23% of the sample), hours worked decreases by 401.9 hours per year. This is 19% relative to the mean hours worked for this group (Table 2b). Among workers with more than 40 hours of work (34% of the sample), labor supply declines by 683 hours, or almost 25% of the baseline mean. These results clearly demonstrate that there is significant heterogeneity in the response to information receipt across the distribution of hours worked. One explanation for these results is that low-hours workers

increase labor supply due to receiving information about low projected PIA levels, and vice

versa for high-hours workers. [10]

One important consideration in examining the effects across the distribution of hours

worked is mean reversion. However, these effects are very unlikely to be seriously affected by

mean reversion as they are relative to individuals providing similar amounts of prior labor supply

but who have not received a Statement. Baseline mean reversion therefore is accounted for by

the dummy variables for each hours worked category.

5.1.2. Earnings Estimates

While hours worked is our preferred measure of labor supply, since it is a direct measure

of worker behavior, it also is informative to examine earnings changes related to Statement

receipt. Earnings estimates are somewhat hard to interpret in this setting, as workers may be

switching jobs with different wage rates, and there is substantially more variability in earnings

than in hours worked from year to year. It thus is not obvious how the hours effects will translate

into earnings changes. We show the results from estimation of equation (1) using earnings as the

dependent variable in Appendix Table A2. Earnings in this table are self-reported by respondents

in the HRS. The earnings estimates are much noisier than the hours estimates in Table 4, but the

signs and magnitudes of the estimates tell a very similar, though somewhat muted, story about

worker responses to Statement receipt. On average, earnings decline by about $599 per year (or

1.7%), and as with hours worked there is a strong age pattern. Furthermore, those who receive a

second statement experience a large earnings decline, although it is not statistically significantly

different from zero. Oddly, those with a 2nd job have higher earnings post-receipt, although this

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[10] Appendix Table A1 shows similar estimates for the labor supply of self-employment hours worked. These results
are correspondingly noisier due to the paucity of self-employment relative to all-employment, but indicate a similar
pattern among these individuals who have greater control over their intensive-margin labor supply.

result is only significant at the 10% level. This is somewhat of a curious result, because we find those with a 2nd job also reduce hours worked significantly. This result suggests these workers are working in higher-wage occupations post Statement receipt.

5.1.3. Estimates Accounting for Wealth

One potentially important source of heterogeneity in how respondents react to Statement receipt is non-Social Security wealth. One might expect those with more wealth to be less responsive to receiving a Statement because Social Security is less important to their overall asset portfolio. However, wealthier people may reduce labor supply more with the receipt of information if they realize their Social Security benefits are small relative to their other wealth, which reduces the relative importance of work. Furthermore, those with higher OAI accrual rates may be less responsive to the Statement information, as they have a higher benefit return to remaining in the labor market.

In Table 5, we test directly for heterogeneity along these dimensions. In column (1) of Table 5, we estimate a version of equation (1) that includes a control for total non-pension wealth (in $1,000s) and an interaction of wealth with Statement receipt. There is clear evidence that those with more non-pension wealth are more responsive to receiving a Statement. For each $1,000 of wealth, the effect of receiving the Statement is reduced by 0.057 hours. However, in the next column when we include defined contribution pension plans as a part of wealth, there is no more evidence of heterogeneity as a function of wealth. The same null result holds if we include the value of Social Security retirement benefits as described in Section 3. It is important to use caution when interpreting these results as there are few observations with defined contribution pensions, but these estimates provide suggestive evidence that wealthier workers

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respond to the Social Security Statement, but only when their wealth is not tied up in retirement savings.

In the final column of Table 5, we test whether there are heterogeneous effects of the Statement as a function of the OAI one-year accrual rate (in percentage points) and of Social Security wealth levels.[11] The average accrual rate is 1%, and such an increase in the accrual rate would increase the effect of Statement receipt by 8.3 hours. Thus, those with a higher return to working respond to the information receipt by working more. In contrast, those with higher wealth levels work less when they receive the Statement. Since these are individuals who tend to have a lower return to work with respect to their Social Security benefits, column (5) of Table 5 shows that the responsiveness to Statement receipt is sensitive to the Social Security returns to working. These results are consistent with previous findings of retirement responsiveness to Social Security benefits (Coile and Gruber 2007) and indicate that the information provision of the Statement contributes to this responsiveness.

5.1.4. Weighted Estimates

As discussed in Section 3, we do not use sampling weights in our analysis. In this section, we explore the sensitivity of our results to the use of these weights. Much of the research using HRS data does not use these sampling weights. In part this is due to the fact that weights are not available in all years, which significantly reduces the sample sizes available and introduces potential biases in the age pattern of the sample. Our main analysis uses the unweighted sample to avoid this problem, but it is important to assess whether this assumption is driving our results.

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[11] Here, Social Security wealth is calculated as the accrued present discounted value of Old Age Insurance benefits if an individual immediately left the labor force and collected benefits at the Full Retirement Age. It therefore represents the "stock" of Social Security wealth already accumulated, while the one-year accrual rate represents the "flow" to this wealth of working an additional year.

We use the 1994 sampling weights, which restrict us to the 1931-1941 birth cohorts. We therefore no longer can examine effects among workers under 50.

Appendix Table A3 contains results that that are akin to the results in Table 4,[12] and the weighted estimates match closely with the unweighted results. They are somewhat larger in absolute value, but that is to be expected since the younger workers with positive responses to the Statement now are excluded from the regressions. Overall, we see little evidence that our decision to use the larger, unweighted sample influenced the conclusions one can draw from our results.

5.2. The Effect of Multiple Statement receipt on Dynamic Labor Supply

We now turn to our analysis of how workers responded to receipt of multiple rounds of information that allowed them to update their knowledge of their Social Security wealth after their response to the first Statement receipt. Table 6 shows estimates of equation (2). In column (1), we show average effects of how second Statement receipt affects the relationship between lagged and current work hours. Column (2) presents estimates disaggregated by pre-Statement (*w-2*) hours. Recall that the thought experiment underlying this analysis is to compare two workers who has similar lagged labor supply changes due to receiving the first Statement but only one of whom received the second Statement. If the reduction in hours worked was due to a misinterpretation of the information given in the Statement, then workers who had reduced their labor supply when they received the first Statement should increase their labor supply when they receive the second one.

The results in Table 6 are consistent with this story. Among those who decreased their hours between *w-2* and *w-1* after having received a first Statement (i.e., $\Delta Hours_{w-2,w-1} < 0$),

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[12] Appendix Table A4 contains descriptive statistics for our weighted sample.

there is a marked and statistically significant increase in hours worked among those who received a second Statement prior to the current survey wave. The estimates in column (1) suggest that for each hour decrease induced by the first Statement, there is a 1/3 of an hour increase due to receiving the second Statement. We interpret this as evidence that a set of workers misunderstood the information on the Statement to be accumulated (rather than projected) wealth and therefore reduced their labor supply. Only when they receive the updated information do they reverse this labor supply decline, and the magnitude of the coefficient is quite large.

In column (2), we show estimates disaggregated by pre-Statement hours of work bins. The results are remarkably stable across the prior distribution of hours worked, with the exception of those who work 20-29 hours per week. All other estimates are negative, statistically significant at the 10% level or higher, and are between -0.3 to -0.4. Thus, although the responses to the first Statement are heterogeneous by prior hours worked, virtually all workers induced to reduce their labor supply due to the first Statement increase their labor supply upon second Statement receipt.

This evidence is consistent with a set of workers responding to the information on the Statement incorrectly due to a misinterpretation of the information. Only when this information is updated can they see their mistake, and they respond by increasing their labor supply. At least for this set of workers, the misleading manner of the Social Security information likely made them worse off than if they had not been given this information. This is particularly true because of the negative utility effects of labor market re-entry among older American that prior work has estimated (Rust and Phelan 1997).

While the results in Table 6 are highly suggestive of worker "mistakes" from misinterpretation of the Statement information, it is possible these workers knew what they were doing and we are picking up planned intertemporal changes in labor supply that happen to be correlated with Statement rollouts. If so, the labor supply changes we analyze should show up in respondent-reported expected PIA. That is, if workers reduced their labor supply in response to the Statement knowing full well it would reduce their Social Security Wealth, we should observe reported PIAs declining.

We explore this question directly in Table 7.[13] Here, we use all workers who report an expected PIA as well as workers who report an accrual rate of at least 1% to focus on those whose Social Security benefits are strongly tied to their continued labor force participation. For workers with an accrual rate of at least 1%,[14] we can be sure that their Social Security wealth will decline if they reduce their labor supply. The dependent variable in this table is an indicator for reporting that one's expected PIA declined between this survey and the prior survey wave. In Columns (1) and (3), there is no evidence that workers who decrease their labor supply believe this will reduce their PIA, on average. This is direct evidence that even older workers do not have a firm grasp of the fact that reducing their hours will negatively influence their Social Security wealth. These estimates support our contention that the changes in labor supply shown in Table 6 reflect responses to misleading information. In columns (5) and (7), we repeat the same exercise with increased expected PIA. Here, there is a strong link between increased hours

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[13] Baseline results for the small subsample of individuals who actually report an expected Social Security benefit are included in Appendix Table A5. As is clear, the same qualitative heterogeneity story obtains, although there is much more of a positive effect at the lower end of the hours worked distribution and less of a negative effect at the higher end. This subsample is substantially older than the main sample, and therefore has more individuals already retired. A sudden realization of a markedly lower Social Security retirement benefit, or perhaps just a reminder of what this retirement benefit is, may be driving this return to the workforce.

[14] This accrual rate is defined as the change in the present discounted value of future Social Security retirement benefits that arises from retiring immediately compared to working an additional year.

worked and workers reporting increases in expected PIA.[15] This asymmetry in beliefs, with

workers understanding that working more will increase benefits but not understanding that

reducing work will lower benefits, is a novel finding in this literature and helps drive the results

shown in Table 6.

In Columns (2) and (4) of Table 7, we examine how the likelihood a respondent reports

declines in expected PIA respond to Statement receipt. Interestingly, for those who have not

received a statement, some workers correctly report that reductions in their labor supply will

reduce their PIA. However, having received the Statement eliminates this effect, especially for

those individuals who will actually experience a decline in their projected PIA due to lower

earnings. The central reason behind this finding is that workers interpret the Statement

information as accumulated wealth, and so they do not believe that reducing labor supply will

reduce their accumulated PIA. Columns (6) and (8), however, show that the reverse situation

does not hold: receiving a Statement does not affect workers' understanding of the positive link

between working more and Social Security benefits. These results support our contention that

workers interpreted the Social Security Statement benefits as accumulated wealth that only could

grow over time if added to through additional earnings.

On the whole, this evidence suggests that older workers misinterpreted the information

they were given. While there is some knowledge that reducing hours worked will lower one's

PIA, the information in the Social Security Statement gave individuals the mistaken belief that

their PIA would not change when they reduced their labor supply. As a result, many workers

reduced their hours worked. When they received the updated Statement, however, they then

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[15] Leibman and Luttmer (2012) find that about 57% of respondents to their survey report that having higher earnings will increase future benefits. Notably, they do not ask about how they think declines in earnings will affect benefits. Our results suggest asymmetric beliefs on the part of older workers, which is consistent with the findings in Leibman and Luttmer (2012).

increased their hours worked again. Our findings thus are consistent with workers being highly responsive to retirement wealth information. But this finding also highlights the need for this information to be transparent and easy to understand, or workers will respond to the information by making optimization errors that can lead them to being worse off.

The behavior observed after second receipt and the change in how individuals perceive the dynamics of their OASDI benefits, suggests that the Statement itself gives workers a better point estimate of their retirement benefit by clarifying its approximate amount, confirming the Mastrobuoni (2011) finding of greater accuracy of projected benefits. Yet, it renders them less likely to understand how this amount is linked to their future earnings. In effect, it provides a shock to knowledge of income, thus inducing an income effect, while diminishing knowledge about the tradeoff between work and benefits, thus reducing the substitution effect. These results underscore the importance of giving older workers accurate information about their retirement benefits that they can use to make more informed labor supply decisions towards the end of their careers.

6. Conclusion

This paper examines how older workers respond to information they receive about their retirement wealth from the Social Security Statement. We exploit the rollout of the Statement to different birth cohorts and different years that we argue was uncorrelated with the underlying labor force attachment and retirement preferences of each cohort. One of our main contributions is to examine labor supply responses that include both the intensive and extensive margins, and we find that older workers' labor supply is highly responsive to receiving information about future Social Security benefits. Statement receipt leads to a reduction of 119 hours worked, on average. However, our estimates point to significant heterogeneity in this response: older

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workers and those with a second job decrease hours of work the most. There is much heterogeneity across the distribution of pre-treatment hours worked as well, with low-hours workers increasing their labor supply post-treatment and high-hours workers significantly reducing their labor supply in response to receiving a Statement.

In the second part of our analysis, we explore the extent to which the information on the Statement may have led some workers to mistakenly reduce their labor supply. This would happen if workers thought the information they were receiving was accumulated rather than projected wealth. We find evidence that this is the case using the rollout of the second Statement workers received that allowed them to update their information. Among workers who reduced their hours worked in the prior period due to receiving the first Statement, they increased their labor supply significantly when they received the second Statement but not if they did not receive it. On average, 1/3 of the prior hours reduction is reversed upon receiving the second Statement. This evidence suggests that once workers' information was updated, they corrected their mistakes and increased their labor supply. Furthermore, we show evidence that the Statement decoupled the link between labor supply changes and projected Social Security benefits, which is consistent with workers interpreting the information on the Statement as accumulated benefits. These result highlight the importance of providing clear information to workers, as it is likely at least some people were left worse off from this misleading information.

Taken together, our results suggest that information older workers have about their retirement benefit levels is an important driver of their labor supply. However, our estimates highlight the difficulty in providing this information: conveying just point estimates decreases the complexity of the information, but also may crowd-out knowledge of the dynamic structure of these projections. That workers are so responsive to information provides much scope for

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information-based policy interventions to help them make more informed labor supply decisions as they approach retirement. An important area for further research is how to provide this information in the most salient and accurate way possible to avoid the complications that we show arise when information is misleading.

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Figure 1: Social Security Statement Phase-In Schedule

	SSA Fiscal Year							
	1994	1995	1996	1997	1998	1999	2000	2001
61 and Older		X					X	X
60		X	X	X	X	X	X	X
58-59			X				X	X
53-58				X			X	X
47-53					X		X	X
40-47						X	X	X
25-40							X	X
Total Statements Sent (millions)	0	7	5.5	12.4	20.7	26.6	134.7	135.6

Note: SSA Fiscal Years are October of the preceding calendar year to September of the stated year. No Statements were sent out before Fiscal Year 1995, and all individuals with Social Security Numbers age 25 and over received a Statement from 2000 to 2011.

Figure 2: Statement Receipt Pattern among 1935-1940 Birth Cohorts

	SSA Fiscal Year							
	1994	1995	1996	1997	1998	1999	2000	2001
61		X					X	X
60		X	X	X	X	X	X	X
59	1935		X				X	X
58	1936		X	X			X	X
57	1937			X			X	X
56	1938			X			X	X
55	1939			X			X	X
54	1940			X			X	X
53				X	X		X	X
52					X		X	X
51					X		X	X
50					X		X	X
49					X		X	X
48					X		X	X
47					X	X	X	X
46						X	X	X

Table 1: Sample Restrictions

	Person-Years
Total	332,721
Between 1992 and 2002	268,102
Matched to Earnings Records	237,928
Under Age 62	112,785
Male	46,288
Qualified for OAI	43,260
In the HRS before First Statement Receipt	21,094
	4,038 Unique Individuals

Table 2a	Mean
Descriptive Statistics, Unweighted	(SD)

Dependent Variables

Annual Hours Worked	1065.28
	(1,252.12)
Self-Employment Annual Hours Worked	227.79
	(764.36)
Self-Reported Annual Earnings	34,836.79
	(58,514.62)
Decreased Expected PIA	0.29
	(0.45)
ln(Self-Reported Earnings)	10.18
	(1.11)
ln(Hours Worked)	7.67
	(0.48)

Independent Variables

Age	52.4
	(6.56)
White	0.803
	(0.398)
Married	0.491
	(0.500)
High School	0.493
	(0.500)
College	0.137
	(0.343)
More than College	0.133
	(0.340)
Total Wealth	292,312.70
	(1,096,645.00)
Wealth + Current Pension Value	515,537.60
	(1,194,929.00)
Wealth + Projected Pension Value	564,967.70
	(1,213,758.00)
OAI Wealth Accrual Rate	0.01
	(0.01)
OAI Wealth	7,730.06
	(3,232.21)
Ever Received Statement	0.389
	(0.488)
Ever Received 2 Statements	0.176
	(0.381)
Had Second Job Before 1st Statement	0.104
	(0.305)

Note: Descriptive statistics from 1992-2002 Health and Retirement Study, matched to SSA administrative records, from sample restrictions outlined in Table 1, unweighted.

Table 2b

Statistics by Pre-Statement Hours Worked

Hours Category	Unique Individuals	Person-Years	Pre-Statement Annual Hours	
			Mean	Median
0 per Week	1268	6251	0	0
1 to 9 per Week	54	277	261.2	260
10 to 19 per Week	87	387	776.4	780
20 to 29 per Week	127	620	1266.5	1280
30 to 39 per Week	209	1117	1770.8	1820
Exactly 40 per Week	921	5075	2076.3	2080
Over 40 per Week	1372	7367	2759.9	2600

Note: Descriptive statistics from 1992-2002 Health and Retirement Study, matched to SSA administrative records, from sample restrictions outlined in Table 1, unweighted. Variation in annual hours worked for those working exactly 40 hours per week comes from individuals reporting between 50 and 52 weeks worked per year.

Table 3

Percentage Change in Projected PIA at Full Retirement Age after
First Statement Receipt, by Change in Labor Supply

Permanent Labor Force Exit	% Change in Projected PIA
Max	-78.2%
95th Percentile	-44.8%
Median	-5.9%
5th Percentile	0.0%
Min	0.0%
Mean	-12.8%
Permanent 50% Decrease in Earnings	
Max	-38.1%
95th Percentile	-22.5%
Median	-4.1%
5th Percentile	0.0%
Min	0.0%
Mean	-6.9%

Note: Change in projected PIA using Social Security Statement
methodology by change in labor supply at first Statement receipt among
HRS sample outlined in Table 1.

Table 4

Effect of Statement Receipt on Annual Hours Worked, Linear Regression Results, 1992-2002

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Annual Hours Worked			
Ever Received Statement	-118.9***	-135.5***	-	-54.1	-79.38*	-121.0***	474.1***
	[45.09]	[39.67]	-	[40.9]	[45.86]	[46.35]	[42.88]
Leading Statement Variable		0.321					
		[17.41]					
Age Category X Statement							
40 to 44			87.29				
			[117.4]				
45 to 49			34.14				
			[93.94]				
50 to 54			15.30				
			[80.13				
55 to 59			-125.3***				
			[40.40]				
60 to 61			-272.7***				
			[44.58]				
Less than High School X Statement				-			
				-			
High School X Statement				-95.2**			
				[37.6]			
College X Statement				-27.7			
				[81.3]			
More than College X Statement				-161.1**			
				[70.8]			
Had a 2nd Job Before Statement Receipt					233.4***		
					[88.3]		
2nd Job X Statement					-469.6***		
					[102.6]		
Ever Received 2 Statements						-227.7***	
						[76.42]	
Pre-Statement Hours Worked Category X Statement							
0 per week							-
							-
1 to 9 per Week							110.3
							[141.6]
10 to 19 per Week							-356.2***
							[111.8]
20 to 29 per Week							-550.7***
							[70.27]
30 to 39 per Week							-609.8***
							[96.66]
Exactly 40 per Week							-876.0***
							[67.30]
Over 40 per Week							-1157.0***
							[72.80]
Age Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Category Control	No	No	Yes	No	No	No	No
Pre-Statement Hour Category Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Only OAI Qualified	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	1.05e-08	-4.63e-08	407.7	9.79e-09	-4.63e-08	1.37e-08	1.52e-09
	[0.00148]	[0.00195]	[250.8]	[0.00185]	[0.00195]	[0.00180]	[0.00122]
Observations	21094	21094	21094	21094	21094	21094	21094
R-squared	0.478	0.478	0.478	0.478	0.463	0.482	0.754

Notes: Unit of observation is person-wave. Dependent variable is self-reported hours worked across all jobs in the reference year. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992). All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are unweighted OLS.

   * Significant at 10% level
  ** Significant at 5% level
 *** Significant at 1% level

Table 5

Effect of Statement Receipt on Annual Hours Worked, Linear Regression Results, 1992-2002					
	(1)	(2)	(3)	(4)	(5)
	Annual Hours Worked				
Ever Received Statement	-118.9***	-31.05	-168.7***	-164.4***	129.7**
	[45.25]	[52.36]	[48.76]	[49.19]	[58.60]
Total Wealth X 1,000		0.055**			
		[0.026]			
Total Wealth X 1,000 X Statement		-0.057**			
		[0.025]			
Wealth + Current Pension Value			3.19e-05		
			[2.74e-05]		
Wealth + Current Pension Value X Statement			-5.56e-05		
			[4.17e-05]		
Wealth + Projected Pension Value				3.24e-05	
				[3.03e-05]	
Wealth + Projected Pension Value X Statement				-5.87e-05	
				[4.27e-05]	
OAI Wealth Accrual Rate					3009**
					[1500]
OAI Wealth Accrual Rate X Statement					8325***
					[1230]
OAI Wealth					0.018
					[0.014]
OAI Wealth X Statement					-0.037***
					[0.010]
Age Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Pre-Statement Hour Category Controls	Yes	Yes	Yes	Yes	Yes
Only OAI Qualified	Yes	Yes	Yes	Yes	Yes
Constant	-4.23e-09	15.63	505.3	503.7	-84.94
	[0.00163]	[15.63]	[328.0]	[327.8]	[78.86]
Observations	21094	19103	4771	4771	20926
R-squared	0.723	0.719	0.441	0.441	0.726

Notes: Unit of observation is person-wave. Dependent variable is self-reported hours worked across all jobs in the reference year. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992). All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are unweighted OLS.

  * Significant at 10% level

 ** Significant at 5% level

*** Significant at 1% level

Table 6

IV Estimates of Second Receipt on Labor Supply, 1992-2002		
Ind. Var.	(i)	(ii)
$\Delta Hours_{iw-2,w-1}$ *Second Statement$_{iw}$	-0.333** (0.165)	
$\Delta Hours_{iw-2,w-1}$ *Second Statement$_{iw:}$		
1 to 9 Hours per Week		-0.361* (0.203)
10 to 19 Hours per Week		-0.330* (0.178)
20 to 29 Hours per Week		0.202 (0.219)
30 to 39 Hours per Week		-0.276* (0.154)
Exactly 40 Hours per Week		-0.492** (0.234)
>40 Hours per Week		-0.412** (0.201)
N	8116	8116

Notes: Unit of observation is person-wave. Dependent variable is self-reported hours worked across all jobs in the reference year. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992) and to person-wave observations that had not received a Statement by wave *w-2* and had at most received the first Statement by wave *w-1*. All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are unweighted 2SLS, where lagged hours of work is instrumented with first Statement receipt as described in the text. The first-stage F-statistic is 19.88.

Table 7

Effect of Statement Receipt on Decrease in Expected PIA, Linear Probability Results, 1992-2002

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Decreased Expected PIA from w-1 to w				Increased Expected PIA from w-1 to w			
Decreased earnings from w-1 to w	0.017	0.040***	-0.002	0.061**				
	[0.013]	[0.017]	[0.023]	[0.027]				
Ever received Statement		0.049		0.089*				
		[0.035]		[0.050]				
Decreased earnings X received Statement		-0.027		-0.077***				
		[0.024]		[0.028]				
Increased earnings from w-1 to w					0.0592***	0.0628***	0.0759***	0.0960**
					[0.0227]	[0.0202]	[0.0261]	[0.0404]
Ever received Statement						0.000117		0.0263
						[0.0450]		[0.0466]
Increased earnings X received Statement						-0.00429		-0.0242
						[0.0279]		[0.0409]
Age fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OAI Wealth Accrual Rate at least 1%	No	No	Yes	Yes	No	No	Yes	Yes
Constant	0.003	-0.046	-0.029	-0.101*	0.973	0.834	0.837	0.814
	[0.017]	[0.046]	[0.025]	[0.061]	[0.0174]***	[0.0391]***	[0.0493]***	[0.0506]***
Observations	2046	2046	1171	1171	2046	2046	1171	1171
R-squared	0.014	0.015	0.019	0.020	0.027	0.027	0.041	0.041

Notes: Unit of observation is person-wave. Dependent variable is whether individual decreased expected PIA from last interview to current interview. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992) who had a predicted PIA last interview and current interview and did not change expected retirement date between the two interviews. PIA Accrual Rate calculated as percentage change between PIA based on working one more year at current earnings level and PIA based on only earnings up until current year. All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are unweighted OLS.

  * Significant at 10% level
  ** Significant at 5% level
  *** Significant at 1% level

Your Social Security Statement

www.socialsecurity.gov

Prepared especially for Wanda Worker

May 1, 2012

See inside for your personal information ⟶

WANDA WORKER
456 ANYWHERE AVENUE
MAINTOWN, USA 11111-1111

What's inside…

What Social Security Means To You

This *Social Security Statement* can help you plan for your financial future. It provides estimates of your Social Security benefits under current law and updates your latest reported earnings.

Please read this *Statement* carefully. If you see a mistake, please let us know. That's important because your benefits will be based on our record of your lifetime earnings. We recommend you keep a copy of your *Statement* with your financial records.

Social Security is for people of all ages…
We're more than a retirement program. Social Security also can provide benefits if you become disabled and help support your family after you die.

Work to build a secure future…
Social Security is the largest source of income for most elderly Americans today, but Social Security was never intended to be your only source of income when you retire. You also will need other savings, investments, pensions or retirement accounts to make sure you have enough money to live comfortably when you retire.

Saving and investing wisely are important not only for you and your family, but for the entire country. If you want to learn more about how and why to save, you should visit *www.mymoney.gov*, a federal government website dedicated to teaching all Americans the basics of financial management.

About Social Security's future…
Social Security is a compact between generations. Since 1935, America has kept the promise of

security for its workers and their families. Now, however, the Social Security system is facing serious financial problems, and action is needed soon to make sure the system will be sound when today's younger workers are ready for retirement.

Without changes, in 2033 the Social Security Trust Fund will be able to pay only about 75 cents for each dollar of scheduled benefits.* We need to resolve these issues soon to make sure Social Security continues to provide a foundation of protection for future generations.

Social Security on the Net…
Visit *www.socialsecurity.gov* on the Internet to learn more about Social Security. You can read publications, including *When To Start Receiving Retirement Benefits*; use our Retirement Estimator to obtain immediate and personalized estimates of future benefits; and when you're ready to apply for benefits, use our improved online application— It's so easy!

Michael J. Astrue
Commissioner

* These estimates are based on the intermediate assumptions from the Social Security Trustees' Annual Report to the Congress.

Your Estimated Benefits

*Retirement   You have earned enough credits to qualify for benefits. At your current earnings rate, if you continue working until…

your full retirement age (67 years), your payment would be about...$ 1,590 a month

age 70, your payment would be about ....$ 1,983 a month

age 62, your payment would be about ....$ 1,096 a month

*Disability   You have earned enough credits to qualify for benefits. If you became disabled right now, your payment would be about...$ 1,450 a month

*Family   If you get retirement or disability benefits, your spouse and children also may qualify for benefits.

*Survivors   You have earned enough credits for your family to receive survivors benefits. If you die this year, certain members of your family may qualify for the following benefits:

Your child...$ 1,133 a month

Your spouse who is caring for your child...$ 1,511 a month

Your spouse, if benefits start at full retirement age...$ 1,477 a month

Total family benefits cannot be more than ....$ 2,782 a month

Your spouse or minor child may be eligible for a special one-time death benefit of $255.

Medicare   You have enough credits to qualify for Medicare at age 65. Even if you do not retire at age 65, be sure to contact Social Security three months before your 65th birthday to enroll in Medicare.

* **Your estimated benefits are based on current law. Congress has made changes to the law in the past and can do so at any time. The law governing benefit amounts may change because, by 2033, the payroll taxes collected will be enough to pay only about 75 percent of scheduled benefits.**

We based your benefit estimates on these facts:

Your date of birth (please verify your name on page 1 and this date of birth) .... May 5, 1971

Your estimated taxable earnings per year after 2011 .... $43,467

Your Social Security number (only the last four digits are shown to help prevent identity theft)......... XXX-XX-1234

How Your Benefits Are Estimated

To qualify for benefits, you earn "credits" through your work — up to four each year. This year, for example, you earn one credit for each $1,130 of wages or self-employment income. When you've earned $4,520, you've earned your four credits for the year. Most people need 40 credits, earned over their working lifetime, to receive retirement benefits. For disability and survivors benefits, young people need fewer credits to be eligible.

We checked your records to see whether you have earned enough credits to qualify for benefits. If you haven't earned enough yet to qualify for any type of benefit, we can't give you a benefit estimate now. If you continue to work, we'll give you an estimate when you do qualify.

What we assumed — If you have enough work credits, we estimated your benefit amounts using your average earnings over your working lifetime. For 2012 and later (up to retirement age), we assumed you'll continue to work and make about the same as you did in 2010 or 2011. We also included credits we assumed you earned last year and this year.

Generally, the older you are and the closer you are to retirement, the more accurate the retirement estimates will be because they are based on a longer work history with fewer uncertainties such as earnings fluctuations and future law changes. We encourage you to use our online Retirement Estimator at *www.socialsecurity.gov/estimator* to obtain immediate and personalized benefit estimates.

We can't provide your actual benefit amount until you apply for benefits. **And that amount may differ from the estimates stated above because:**

(1) Your earnings may increase or decrease in the future.
(2) After you start receiving benefits, they will be adjusted for cost-of-living increases.

(3) Your estimated benefits are based on current law. **The law governing benefit amounts may change.**
(4) Your benefit amount may be affected by **military service, railroad employment or pensions earned through work on which you did not pay Social Security tax**. Visit *www.socialsecurity.gov* to learn more.

Windfall Elimination Provision (WEP) — In the future, if you receive a pension from employment in which you do not pay Social Security taxes, such as some federal, state or local government work, some nonprofit organizations or foreign employment, and you also qualify for your own Social Security retirement or disability benefit, your Social Security benefit may be reduced, but not eliminated, by WEP. The amount of the reduction, if any, depends on your earnings and number of years in jobs in which you paid Social Security taxes, and the year you are age 62 or become disabled. For more information, please see *Windfall Elimination Provision* (Publication No. 05-10045) at *www.socialsecurity.gov/WEP*.

Government Pension Offset (GPO) — If you receive a pension based on federal, state or local government work in which you did not pay Social Security taxes and you qualify, now or in the future, for Social Security benefits as a current or former spouse, widow or widower, you are likely to be affected by GPO. If GPO applies, your Social Security benefit will be reduced by an amount equal to two-thirds of your government pension, and could be reduced to zero. Even if your benefit is reduced to zero, you will be eligible for Medicare at age 65 on your spouse's record. To learn more, please see *Government Pension Offset* (Publication No. 05-10007) at *www.socialsecurity.gov/GPO*.

Your Earnings Record

Years You Worked	Your Taxed Social Security Earnings	Your Taxed Medicare Earnings
1987	594	594
1988	1,454	1,454
1989	2,591	2,591
1990	4,366	4,366
1991	5,961	5,961
1992	7,500	7,500
1993	9,055	9,055
1994	11,509	11,509
1995	14,064	14,064
1996	16,545	16,545
1997	19,147	19,147
1998	21,699	21,699
1999	24,363	24,363
2000	27,015	27,015
2001	28,798	28,798
2002	30,079	30,079
2003	31,668	31,668
2004	33,906	33,906
2005	35,897	35,897
2006	38,192	38,192
2007	40,552	40,552
2008	42,127	42,127
2009	41,977	41,977
2010	43,467	43,467
2011		Not yet recorded

You and your family may be eligible for valuable benefits:

When you die, your family may be eligible to receive survivors benefits.

Social Security may help you if you become disabled— even at a young age.

A young person who has worked and paid Social Security taxes in as few as two years can be eligible for disability benefits.

Social Security credits you earn move with you from job to job throughout your career.

Total Social Security and Medicare taxes paid over your working career through the last year reported on the chart above:

Estimated taxes paid for Social Security:		Estimated taxes paid for Medicare:	
You paid:	$33,009	You paid:	$7,724
Your employers paid:	$33,009	Your employers paid:	$7,724

Note: In 2011, you paid 4.2 percent of your salary, up to $106,800, in Social Security taxes and 1.45 percent in Medicare taxes on your entire salary. Your employer paid 6.2 percent in Social Security taxes and 1.45 percent in Medicare taxes for you. If you were self-employed, you paid the combined employee and employer amount of 10.4 percent in Social Security taxes and 2.9 percent in Medicare taxes on your net earnings.

Help Us Keep Your Earnings Record Accurate

You, your employer and Social Security share responsibility for the accuracy of your earnings record. Since you began working, we recorded your reported earnings under your name and Social Security number. We have updated your record each time your employer (or you, if you're self-employed) reported your earnings.

Remember, it's your earnings, not the amount of taxes you paid or the number of credits you've earned, that determine your benefit amount. When we figure that amount, we base it on your average earnings over your lifetime. If our records are wrong, you may not receive all the benefits to which you're entitled.

Review this chart carefully using your own records to make sure our information is correct and that we've recorded each year you worked. You're the only person who can look at the earnings chart and know whether it is complete and correct.

Some or all of your earnings from **last year** may not be shown on your *Statement*. It could be that we still were processing last year's earnings reports when your *Statement* was prepared. Your complete earnings for last year will be shown on next year's *Statement*. **Note:** If you worked for more than one employer during any year, or if you had both earnings and self-employment income, we combined your earnings for the year.

There's a limit on the amount of earnings on which you pay Social Security taxes each year. The limit increases yearly. Earnings above the limit will not appear on your earnings chart as Social Security earnings. (For Medicare taxes, the maximum earnings amount began rising in 1991. Since 1994, **all** of your earnings are taxed for Medicare.)

Call us right away at **1-800-772-1213** (7 a.m.–7 p.m. your local time) if any earnings for years **before last year** are shown incorrectly. Please have your W-2 or tax return for those years available. (If you live outside the U.S., follow the directions at the bottom of page 4.)

Some Facts About Social Security

About Social Security and Medicare…

Social Security pays retirement, disability, family and survivors benefits. Medicare, a separate program run by the Centers for Medicare & Medicaid Services, helps pay for inpatient hospital care, nursing care, doctors' fees, drugs, and other medical services and supplies to people age 65 and older, as well as to people who have been receiving Social Security disability benefits for two years or more. Medicare does not pay for long-term care, so you may want to consider options for private insurance. Your Social Security covered earnings qualify you for both programs. For more information about Medicare, visit *www.medicare.gov* or call **1-800-633-4227** (TTY **1-877-486-2048** if you are deaf or hard of hearing).

Retirement — If you were born before 1938, your full retirement age is 65. Because of a 1983 change in the law, the full retirement age will increase gradually to 67 for people born in 1960 and later.

Some people retire before their full retirement age. You can retire as early as 62 and take benefits at a reduced rate. If you work after your full retirement age, you can receive higher benefits because of additional earnings and credits for delayed retirement.

Disability — If you become disabled before full retirement age, you can receive disability benefits after six months if you have:
— enough credits from earnings (depending on your age, you must have earned six to 20 of your credits in the three to 10 years before you became disabled); and
— a physical or mental impairment that's expected to prevent you from doing "substantial" work for a year or more *or* result in death.

If you are filing for disability benefits, please let us know if you are on active military duty or are a recently discharged veteran, so that we can handle your claim more quickly.

Family — If you're eligible for disability or retirement benefits, your current or divorced spouse, minor children or adult children disabled before age 22 also may receive benefits. Each may qualify for up to about 50 percent of your benefit amount.

Survivors — When you die, certain members of your family may be eligible for benefits:
— your spouse age 60 or older (50 or older if disabled, or any age if caring for your children younger than age 16); and
— your children if unmarried and younger than age 18, still in school and younger than 19 years old, or adult children disabled before age 22.

If you are divorced, your ex-spouse could be eligible for a widow's or widower's benefit on your record when you die.

Extra Help with Medicare — If you know someone who is on Medicare and has limited income and resources, extra help is available for prescription drug costs. The extra help can help pay the monthly premiums, annual deductibles and prescription co-payments. To learn more or to apply, visit *www.socialsecurity.gov* or call **1-800-772-1213** (TTY **1-800-325-0778**).

Receive benefits and still work...

You can work and still get retirement or survivors benefits. If you're younger than your full retirement age, there are limits on how much you can earn without affecting your benefit amount. When you apply for benefits, we'll tell you what the limits are and whether work would affect your monthly benefits. When you reach full retirement age, the earnings limits no longer apply.

Before you decide to retire...

Carefully consider the advantages and disadvantages of early retirement. If you choose to receive benefits before you reach full retirement age, your monthly benefits will be reduced.

To help you decide the best time to retire, we offer a free publication, *When To Start Receiving Retirement Benefits* (Publication No. 05-10147), that identifies the many factors you should consider before applying. Most people can receive an estimate of their benefit based on their actual Social Security earnings record by going to *www.socialsecurity.gov/estimator*. You also can calculate future retirement benefits by using the Social Security Benefit Calculators at *www.socialsecurity.gov*.

Other helpful free publications include:
— *Retirement Benefits* (No. 05-10035)
— *Understanding The Benefits* (No. 05-10024)
— *Your Retirement Benefit: How It Is Figured* (No. 05-10070)
— *Windfall Elimination Provision* (No. 05-10045)
— *Government Pension Offset* (No. 05-10007)
— *Identity Theft And Your Social Security Number* (No. 05-10064)

We also have other leaflets and fact sheets with information about specific topics such as military service, self-employment or foreign employment. You can request Social Security publications at our website, *www.socialsecurity.gov*, or by calling us at **1-800-772-1213**. Our website has a list of frequently asked questions that may answer questions you have. We have easy-to-use online applications for benefits that can save you a telephone call or a trip to a field office.

You may also qualify for government benefits outside of Social Security. For more information on these benefits, visit *www.govbenefits.gov*.

If you need more information—Contact any Social Security office, or call us toll-free at **1-800-772-1213**. (If you are deaf or hard of hearing, you may call our TTY number, 1-800-325-0778.) If you have questions about your personal information, you must provide your complete Social Security number. If you are in the United States, you also may write to the Social Security Administration, Office of Earnings Operations, P.O. Box 33026, Baltimore, MD 21290-3026. If you are outside the United States, please write to the Office of International Operations, P.O. Box 17769, Baltimore, MD 21235-7769, USA. You can request a *Statement* at any time.

Appendix Table A1

Effect of Statement Receipt on Annual Self-Employment Hours Worked, Linear Regression Results, 1992-2002

	(1)	(2)	(3)	(4)	(5)	(6)
	Annual Self-Employed Hours Worked					
Ever Received Statement	12.74		38.47**	52.15***	12.43	121.4***
	[14.01]		[19.28]	[17.28]	[15.34]	[16.58]
Age Category X Statement						
40 to 44		48.16**				
		[24.40]				
45 to 49		100.0**				
		[47.38]				
50 to 54		19.69				
		[40.91]				
55 to 59		0.023				
		[17.56]				
60 to 61		-13.34				
		[15.69]				
Less than High School X Statement						
High School X Statement			-45.58***			
			[17.65]			
College X Statement			3.91			
			[39.02]			
More than College X Statement			-40.66**			
			[16.58]			
Had a 2nd Job Before Statement Receipt				56.56**		
				[26.95]		
2nd Job X Statement				-108.9		
				[73.55]		
Ever Received 2 Statements					-32.21	
					[21.01]	
Pre-Statement Self Worked Category X Statement						
0 per Week						-
						-
1 to 9 per Week						20.62
						[129.5]
10 to 19 per Week						-215.2
						[169.6]
20 to 29 per Week						-173.3
						[124.7]
30 to 39 per Week						-195.6**
						[90.47]
Exactly 40 per Week						-798.0***
						[161.3]
Over 40 per Week						-1115.0***
						[99.07]
Age Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Age Category Control	No	Yes	No	No	No	No
Pre-Statement Hour Category Controls	Yes	Yes	Yes	Yes	Yes	Yes
Only OAI Qualified	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-5.48e-09	153.9	-6.85e-09	-2.242	-7.07e-09	6.80e-09
	[0.0166]	[79.54]*	[0.00105]	[5.706]	[0.0150]	[0.00281]
Observations	21094	21094	21094	21094	21094	21094
R-squared	0.438	0.453	0.439	0.45	0.440	0.849

Notes: Unit of observation is person-wave. Dependent variable is self-reported hours worked across all self-employment jobs in the reference year. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992). All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are unweighted OLS.

  * Significant at 10% level
 ** Significant at 5% level
*** Significant at 1% level

Effect of Statement Receipt on Annual Self-Reported Earnings, Linear Regression Results, 1992-2002

	(1)	(2)	(3)	(4)	(5)
	Self-Reported Earnings from All Jobs per Year, 2000 Dollars				
Ever Received Statement	-598.9		627.2	-746.1	-684.2
	[868.5]		[1001]	[1235]	[914.1]
Age Category X Statement					
40 to 44		12130***			
		[4374]			
45 to 49		4781			
		[4331]			
50 to 54		-511.7			
		[1248]			
55 to 59		-2036			
		[1399]			
60 to 62		-973.8			
		[2391]			
Less than High School X Statement					
High School X Statement			-1218		
			[926]		
College X Statement			-3228		
			[5065]		
More than College X Statement			-2591		
			[4523]		
Had a 2nd Job Last Interview				-5301***	
				[1722]	
2nd Job Last Interview X Statement				8895*	
				[5281]	
Ever Received 2 Statements					-2283
					[1789]
Age Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Age Category Control	No	Yes	No	No	No
Pre-Statement Hour Category Controls	Yes	Yes	Yes	Yes	Yes
Only OAI Qualified	Yes	Yes	Yes	Yes	Yes
Constant	4607	2244	2612	2408	4483
	[3417]	[4283]	[3555]	[2004]	[3449]
Observations	19103	19103	19103	19103	19103
R-squared	0.088	0.087	0.089	0.123	0.088

Notes: Unit of observation is person-wave. Dependent variable is self-reported earnings across all jobs in the reference year, price adjusted to 2000 dollars with the CPI-U-RS. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992). All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are unweighted OLS.

  * Significant at 10% level
 ** Significant at 5% level
*** Significant at 1% level

Appendix Table A3

Effect of Statement Receipt on Annual Hours Worked, Linear Regression Results, 1992-2002

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Self-Reported Hours Worked per Year						
Ever Received Statement	-241.6***	-282.2***	-	-141.1***	-207.7***	-265.8***	433.4***
	[40.47]	[14.89]	-	[45.17]	[43.09]	[24.73]	[69.67]
Leading Statement Variable		-7.03					
		[16.13]					
Age Category X Statement							
50 to 54			-144.5*				
			[75.18]				
55 to 59			-204.4***				
			[34.77]				
60 to 61			-389.8***				
			[55.21]				
Less than High School X Statement				-			
				-			
High School X Statement				-143.1***			
				[54.34]			
College X Statement				-109.8			
				[127.8]			
More than College X Statement				-139.8			
				[98.32]			
Had a 2nd Job Before Statement Receipt					176.9**		
					[70.72]		
2nd Job X Statement					-319.7***		
					[94.56]		
Ever Received 2 Statements						-304.7***	
						[93.30]	
Pre-Statement Hours Worked Category X Statement							
0 per week							-
							-
1 to 9 per Week							91.32
							[121.9]
10 to 19 per Week							-405.8**
							[194.4]
20 to 29 per Week							374.7***
							[65.41]
30 to 39 per Week							-500.5***
							[102.2]
Exactly 40 per Week							-833.1***
							[98.21]
Over 40 per Week							-1098***
							[97.18]
Age Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Category Control	No	No	Yes	No	No	No	No
Pre-Statement Hour Category Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Only OAI Qualified	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	1.05e-08	-4.63e-08	407.7	9.79e-09	-4.63e-08	1.37e-08	1.52e-09
	[0.00148]	[0.00195]	[250.8]	[0.00185]	[0.00195]	[0.00180]	[0.00122]
Observations	16810	16810	16810	16810	16810	16810	16810
R-squared	0.703	0.704	0.715	0.703	0.703	0.706	0.754

Notes: Unit of observation is person-wave. Dependent variable is self-reported hours worked across all jobs in the reference year. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992). All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are weighted OLS.

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level

Appendix Table A4

Descriptive Statistics, Weighted

	Mean (SD)
Dependent Variables	
Annual Hours Worked	1760.91
	(1,179.49)
Self-Employment Annual Hours Worked	419.31
	(1,010.79)
Self-Reported Annual Earnings	37,354.99
	(69,343.22)
Adminstrative Annual Earnings	28,021.21
	(24,754.33)
Decreased Expected PIA	0.28
	(0.45)
ln(Self-Reported Earnings)	10.09
	(1.22)
ln(Hours Worked)	7.67
	(0.48)
Independent Variables	
Age	57.24
	(2.90)
White	0.908
	(0.289)
Married	0.848
	(0.359)
High School	0.505
	(0.500)
College	0.123
	(0.329)
More than College	0.121
	(0.326)
Ever Received Statement	0.390
	(0.488)
Ever Received 2 Statements	0.135
	(0.342)
Had Second Job Before 1st Statement	0.122
	(0.328)

Hours Worked Category Pre-Statement among those with Positive Hours Worked Pre-Statement

	All Hours Worked	Self-Employed Hours Worked
1 to 9 per Week	12.95%	80.91%
10 to 19 per Week	1.92%	0.96%
20 to 29 per Week	3.95%	1.78%
30 to 39 per Week	7.11%	2.35%
Exactly 40 per Week	27.01%	2.08%
Over 40 per Week	47.07%	11.91%

Note: Descriptive statistics from 1992-2002 Health and Retirement Study, matched to SSA administrative records, from sample restrictions outlined in Table 1, weighted with 1994 HRS person-level weights.

Appendix Table A5

Effect of Statement Receipt on Annual Hours Worked among HRS Respondents with Expected Social Security Benefit, Linear Regression Results, 1992-2002

	Currently Has PIA Expectation		Ever Had PIA Expectation	
	(1)	(2)	(3)	(4)
	Annual Hours Worked			
Ever Received Statement	-46.25	1039***	-56.91	911.5***
	[50.74]	[157.1]	[52.41]	[112.1]
Hours Category X Statement				
0 per week		-		-
		-		-
1 to 9 per Week		-363.2***		-199.8
		[125.3]		[152.6]
10 to 19 per Week		-932.8***		-828.8***
		[192.8]		[183.5]
20 to 29 per Week		-823.3***		-754.6***
		[175.5]		[119.8]
30 to 39 per Week		-1051***		-945.5***
		[157.1]		[117.7]
Exactly 40 per Week		-1258***		-1153***
		[126.4]		[103.1]
Over 40 per Week		-1469***		-1414***
		[157.6]		[128.5]
Age Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Pre-Statement Hour Category Controls	Yes	Yes	Yes	Yes
Only OAI Qualified	Yes	Yes	Yes	Yes
Constant	785.0	-169.9	-15.31	9.05e-09
	[344.8]**	[403.9]	[55.68]	[0.00243]
Observations	4267	4267	6890	6890
R-squared	0.431	0.463	0.455	0.489

Notes: Unit of observation is person-wave. Dependent variable is self-reported hours worked across all jobs in the reference year. Sample limited to under age 62 men fully insured for Old Age Insurance in 1991 (those with at least 40 Quarters of Coverage by 1992). All regressions control for marital status, education, race, and age and year fixed effects; standard errors in brackets are two-way clustered at year and birth-year levels, 1992-2002 (i.e. HRS waves 2-6). All specifications are unweighted OLS.

  * Significant at 10% level
 ** Significant at 5% level
*** Significant at 1% level