How Does Social Security Claiming Respond to Incentives? Considering Husband's and Wives' Benefits Separately

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Abstract

A majority of women receive most of their Social Security benefits based upon their husbands' earnings history; however, we do not know whether husbands' behavior takes this dependence into account. To explore this relationship, in this paper I separately estimate the claiming response to incentives for each of the three types of Social Security benefits: retired worker, spousal, and survivor. This approach departs from the previous literature, which estimates behavioral responses to household incentives. I begin by documenting that failure to maximize household Social Security wealth results in a financial burden borne primarily by the wife. I next estimate husbands' behavioral response to Social Security benefit incentives, with my focus exclusively upon incentives due to the actuarial adjustment from delayed claiming. I find that while husbands are responsive to their own benefit incentives, they are barely responsive to household, spousal, or survivor benefit incentives if at all. Furthermore, I find husbands who have more education are less likely to claim in a given period, all else equal, but do not respond to the dependent benefit incentives.

Introduction

Almost half of men claim their Social Security retired worker benefits from Social Security at age 62, the first year of eligibility. The decision making process that results in this behavior is not well understood; it is not consistent with financial or simple utility maximization (Coile et al, 2002; Sass and Sun, 2009). While this choice does not impact their own expected lifetime benefits drastically, it can have a large impact on the benefits their wives receive. Husbands' claiming age impacts wives since early claiming reduces the maximum level of the survivor benefit the wife can receive, up to a 17.5% reduction of the base monthly benefit paid to surviving spouses due to the widow(er)'s limit provision (Weaver, 2001). His behavior also affects his wife because she may not receive spouse benefits until after the husband begins to receive his own retired worker benefits. It is imperative to note that most women find themselves in this position, circumstances which will continue in the years to come. This dependence will remain in the face of a large increase in the fraction of women eligible for their own Social Security benefit. Over the past 50 years, the fraction of female Social Security recipients eligible for their own benefit has almost doubled. However, almost 60% of current female recipients are receiving dependent benefits, either spouse or widow benefits. Less than one quarter of recent female Social Security recipients have a retired worker benefit larger than their potential survivor benefit and therefore are unaffected by their husbands' claiming date. This suggests that even the women who have driven the female labor force revolution will still be dependent on their husbands in old age.

Since Social Security is a near universal public pension program, it differs from other public programs in that the take-up decision is not the traditional yes-no question but one of timing. Each individual chooses an age between 62 and 70 to begin benefit receipt. For each individual, the age that maximizes expected household lifetime benefits is typically between 62 and 65. However, maximizing worker benefits predicts different behavior than maximizing household benefits. In many cases, household expected lifetime benefits are increased by delayed claiming but this not true for men's retired worker benefits.

Little attention has been given to Social Security benefit claiming as the literature has focused on retirement behavior and labor supply in old age. However, there are compelling arguments to look at claiming separate from retirement. First, Social Security comprises a large portion of income for a many Americans, and we know very little about what drives the decision

to claim benefits. In an era of near-certain Social Security reform, we need to better understand how individuals and households respond to the Social Security system. There are multiple parameters of the Social Security to be considered for reform and evaluating behavioral response to incentives that result from the overall program does not help us understand which channel drives behavior. There are also implications for the solvency of the program as money "left on the table" by households is money which remains in the Social Security Trust Fund.

The decision to begin receipt of benefits is purely financial. Many chose to claim and retire concurrently but this is not required. The decision of when to claim benefits impacts the household budget constraint today and in the future even after one's death due to survivor benefits. Most major household financial decisions revolve around goods that are jointly consumed: real estate, children's schooling, etc. In old age, this is not always true. At some point in time, one spouse will pass away. Typically, women outlive their husband since most are younger than their husband and women live longer lives. As widows, women's economic well-being is in part determined by survivor benefits from Social Security and any bequests. The survivor benefits depend on a choice the husband made before he died in most cases; he plays a role is determining her well-being well in advance.

There are two more practical arguments to focus my attention on the choice of claiming age. First, the date of claiming is concrete. I can measure the day benefits are received whereas retirement is a flexible definition to both researchers and individuals, which likely do not coincide. Second, claiming also allows us to analyze the full [eligible] population, where the retirement literature is limited to those working or with a career.

The role of financial incentives has been thoroughly examined in the retirement literature but only recently has the literature started to think about the relationship between these incentives and claiming. Coile et al (2002) is arguably the most thorough examination of the claiming decision to date. Since their study, Hurd et al (2004) and Delavande et al (2006) have found favorable expected mortality leads to slightly delayed claiming. This is expected as personal beliefs about mortality change the time period over which benefits will be received. Sass et al (2007) asked whether early claiming is due to ignorance or selfishness on the part of the husbands but do not find conclusive evidence of either hypothesis. In addition, a few structural studies of retirement, such as Gustman and Steinmeier (2004) and Rust and Phelan (1997), have tried to incorporate claiming.

This study focuses on the role of financial incentives in the claiming decision. I first define incentives in terms of total expected lifetime wealth from Social Security, Social Security Wealth (SSW) following the literature. This value depends on age at claiming due to an actuarial adjustment applied to monthly benefits at the date of initial receipt. The incentives measure how much SSW changes with benefit claiming age. Total household Social Security benefits have multiple parts. Each member of the household, husband and wife, can receive their own retired worker benefit and the 'dependent spouse' can receive spouse and survivor benefits instead if they exceed her own retired worker benefit. The implicit assumption made in previous literature is husbands consider his own benefit and any benefits received by his spouse equally when deciding when to claim benefits or retire. However, it seems plausible that he might respond differently to each type of benefit. The existence of this possibility has not been mentioned in the retirement literature. This research extends the previous literature on claiming behavior and introduces heterogeneity in the response to financial incentives that varies by type of benefit received. This approach can be applied to studies of retirement in the future.

There are a number of provisions in the Social Security benefit rules that create non-monotonic variation in the relationship between earnings history and benefit incentives. Spouse benefits are set at half of the retired worker benefit and the importance of these benefits will vary with the strength of the wife's work history. The same rationale holds for survivor benefits, which are set equal to the deceased's retired worker's benefits. In addition, there is a non-linear mapping included in the calculation of monthly benefits where the replacement rate is highest for those with the lowest earnings. Most previous research uses the variation from all benefit rules together to identify how claiming [or retirement] responds to Social Security benefit incentives with the exception of Liebman et al (2009)[1]. As shown later, certain variation is driven by the spousal benefits while other are from survivor benefits. It makes sense to use the appropriate variation to identify the response for each type of financial incentive.

Most of the variation in incentives can be explained by earnings history. This is particularly true once I separate incentives by type. Therefore, I rely heavily on changes to the Social Security benefit formulas for more exogenous variation. These rules impact both the normal retirement age (NRA) and the delayed retirement credit (DRC). These new laws create

[1] Liebman et al (2009) identify 12 rules in the Social Security benefit formulas that could be used for identification of a response to benefit rules. They use 5 rules in their study for identification which apply to labor supply incentives.

eleven birth cohort groups in the male population, each facing a different set of rules. Changes in the NRA increases the penalty to early claiming and the increase in DRC increase the return to delay past the NRA.

The empirical analysis considers all men born between 1922 and 1940. I include those unmarried at time of claiming in the base model which may sound puzzling since our underlying motivation is how husbands' behavior impacts wives' outcomes. This logic is this: if husbands only consider their own benefits and not spouse or survivor benefits when deciding when to claim, then there should be no difference in behavior between married and unmarried men. The non-married men are a control group. There are other differences by marital status such as joint consumption of leisure that could impact claiming, perhaps, but a thorough examination is left for future research. Since there is evidence of retirement and claiming coordination, I estimate the model on a subsample of those who have exited the labor force prior to age 62. These results may be a cleaner estimate of the claiming response, but we also may be estimating a different behavioral response since this group has chosen to leave the labor force early and can fund early retirement.

Financial maximization suggests if there is a large gain [penalty] to delay claiming, an individual is more [less] likely to delay. Therefore, we predict a negative sign on the coefficient for Social Security incentives. I do not see a large response to the incentives from household benefits either; mostly the coefficient is small and insignificant. The coefficient on the incentive measure for the retired worker benefit is negative and significant in all models where benefit incentives are entered separately. The estimates of the response to incentives due to spouse or survivor benefits are small in all models and are insignificant in most cases. The coefficient on worker incentives from the retired subsample is larger than the full sample. The early retirees may be more responsive to incentives due to a lack of credit constraints[2].

It would not be surprising if the results are driven by segments of the population who are more likely to consider financial incentives or who understand the incentives better. Chan and Stevens (2008) find for private pension incentives the full sample estimate is driven solely by those who fully understand the incentives they face. Another scenario is individuals who differ along health dimensions might be respond differently to incentives. They also face different

[2] Coile et al (2002) find in the New Beneficiary Data System (NBDS) approximately 90% of early retirees claim benefits by their 63rd birthday.

incentives due to varying mortality prospects. Those who we observe to live longer likely have private information about their health and may also be more responsive to incentives. Furthermore, since incentives are calculated using the population life tables, I will mismeasure the true incentives. A full treatment of this measurement error is out of the scope of this paper and left for future work. I will estimate the model on subsamples where measured incentives are closer to the true incentives. Finally, I want to consider a role for joint leisure in the claiming decision since it has proved to be an important factor in determining couples' retirement decisions. As a result of all of these possibilities, I want to allow for heterogeneous responses to incentives. I find that education and wife's labor force status, a proxy for joint leisure, impact the claiming decision directly but do not impact the response to financial incentives.

The structure for the remainder of the paper is as follows: Section II provides background on Social Security benefits, women in Social Security, and previous literature, Section III details the data and compares SSW maximizing claiming age with actual claiming behavior, Section IV provides empirical specification and results and Section V concludes.

II. Background

Features of Social Security benefits

There are three main types of old age benefits provided by the Old Age, Survivor, and Disability Insurance (OASDI) program: retired worker, spouse, and survivor benefits. Individuals are eligible for retired worker benefits if they have 40 quarters of covered earnings over their lifetime. The first calculation to determine the monthly benefit is the averaged indexed monthly earnings (AIME), an average of the highest 35 years of earnings indexed to average wages in each year. This calculation includes zeros if fewer than 35 years contain positive earnings, a penalty for those without a complete work history. However, there is a progressive formula to transform the AIME to the primary insurance amount (PIA) so those with lower lifetime average earnings experience a higher replacement rate than those with the higher earnings. The PIA is the amount of monthly benefits received if the worker claims their benefits at the normal retirement age (NRA). Retired worker benefits can be claimed beginning at age 62, with a penalty for claiming between age 62 and the NRA. In addition, there is a reward for claiming after the NRA, the delayed retirement credit (DRC) that varies by birth cohort. As a result, age at claiming has a direct and significant impact on the level of monthly benefit.

Since Social Security was founded in an era of one-earner families, a spousal benefit provision was included since many wives would not have a benefit based on their own work history. As a result, wives are entitled to a benefit equal to half of their husband[3]. Penalties apply to the monthly benefit if the spouse claims prior to her NRA, but the husband's claiming age does not impact the level of the spouse benefit directly. Wives may not claim the spouse benefit until after the worker claims his own benefit. The husband's claiming age can indirectly affect the level of spouse benefits through this timing channel. To ease in following discussion, I refer to the ratio [Wife PIA/Husband PIA] as the "PIA ratio". Wives expect to receive a spouse benefit if the PIA ratio is below 0.5[4]. Finally, when one's spouse dies, the survivor is entitled to a benefit equal to that received by the deceased. If the deceased claimed their own benefit early, then penalties carry over to survivor benefit. In addition, if the deceased delayed claiming past the normal retirement age, the credits applied to their monthly benefit will carry over to the survivor benefit. Survivor benefits can be claimed beginning at age 60.

Since the impact of claiming age is a central part of the analysis, I want to discuss the rules in more detail. Claiming age determines the actuarial adjustment applied to the PIA to calculate monthly benefit amount (MBA). Those that claim at their NRA receive their PIA as their monthly benefit amount. For each month prior to NRA benefits are claimed, a penalty of 5/9 of 1% is applied to the PIA, up to 36 months. Therefore, those born 1937 and earlier receive 80% of their PIA if they claim benefits at age 62 and 0 months. For those born 1938 and later, the early entitlement age is more than 36 months prior to the NRA. If someone in this cohort claims prior to 36 months before the NRA, they are penalized an additional 5/12 of one percent per extra month of claiming early past 36 months. For example, those born in 1939 have a NRA of 65 years and 4 months. If they claim at 62 and 2 months, they are penalized [20% + 2*(5/12)%)] for a total penalty of 20.83% applied to the PIA.

Spouse benefits are also subject to an actuarial adjustment. However, it is the wife's claiming age which impacts the determination of MBA. The spouse benefit, equal to 0.5*Husband's PIA, is penalized (25/36)% for each month prior to the NRA up to 36 months and 5/12% for each month of early claiming greater than 36. Survivor benefit calculation is the

[3] I use husband and wife since this is the typical arrangement. Of course, husbands are entitled to a spouse benefit as well. Less than 2 % of male benficiaries receive spouse or survivor benefits.
[4] The cutoff for spouse benefits in general is 0.5 but is only practically relevant if she claims spouse benefits at her NRA. If she claims her own benefits before age 65, the relevant threshold increases.

most involved, as both the husband's and wife's claiming age determines the MBA. The claiming age of her husband sets a maximum value for the survivor benefit. The policymakers' rationale was the survivor should not receive more than the worker did before his death. The formula for survivor benefits is:

$$\text{Actuarial Adjustment} = \begin{cases} Min\{\text{Husband's PIA} * \max(\text{Husband's actuarial adjustment}, 0.825), \\ \quad \text{Husband's PIA} * \text{Wife's actuarial adjustment}\} \text{ if Husband's claiming age} < 65 \\ \text{Husband's PIA} * \text{Husband's actuarial adjustment} * \text{Wife's actuarial adjustment} \\ \quad \text{if Husband's claiming age} \geq 65 \ \& \ \text{Wife's claiming age} < 65 \\ \text{Husband's PIA} * \text{Husband's actuarial adjustment} \\ \quad \text{if Husband's claiming age} \geq 65 \ \& \ \text{Wife's claiming age} \geq 65 \end{cases}$$

The first line describes the benefit if the husband claims early. He creates a ceiling for the maximum benefit she can receive. If he claims at the EEA, there is a special provision so that the cap is 82.5% of her husband's PIA. The second and third line detail the adjustment if he delays claiming past his NRA. The base survivor benefit increases regardless of when the wife claims.

Calculation of Household Social Security Wealth

In order to calculate incentives, I need to detail the calculation of expected lifetime Social Security benefits, Social Security Wealth (SSW). For each potential claiming age, we compute the future monthly payments from the PIA and actuarial adjustments. In addition, we include any retired worker benefits, spouse and survivor benefits the wife expects to receive. All calculations assume the wife claims as soon as possible. If she is eligible for her own benefits, she begins receipt at age 62. She is permitted to switch to the spouse benefit when her husband claims if it is larger than her own retired worker benefit. These are the same assumptions used by Leibman et al (2009) when they calculate household SSW. The other event which permits a change of benefit type is the death of her spouse. Adding in her choice of claiming age complicates the process an immense amount and should have little effect in practical terms given most women should claim at age 62 to maximize SSW. This conclusion comes from my own calculations and the results of Sass et al (2007). Once we have the household total monthly payments, we discount the lifetime stream to the present [age 62]. I follow the literature and use

a 3% annual discount factor[5]. For the probability of surviving to each future period, I use sex-specific mortality tables from the Social Security Administration from 1980, 1990, and 2000 since the sample turns 62 between 1984 and 2002.

For an individual (male) worker with an average life expectancy, claiming age has very limited impact on his expected lifetime worker benefits. Figure 1 presents how the male lifetime worker benefits vary with claiming age. For exposition, I use the life table from 1990, NRA of 65, and a DRC of 6.5. This would be applicable for those born in 1936 or 1937. Between age 62 and 64, expected benefits do not change much. After the NRA, there is a steep decline due to a less than actuarially fair DRC.

The household SSW can be impacted a great deal, however. This is shown in Figure 2 for two hypothetical couples where the wife is 3 years younger than her husband. Wives are on average 3 years younger than their husband. The first is when the wife is not eligible for her own benefits, parallel to the presentation from Coile et al (2002). The second couple is one where the wife's PIA is large enough to make the spouse benefits unwanted. Expected survivor benefits will increase as the husband delays claiming, and spouse benefits will increase or decrease depending on the age difference between spouses and the PIA ratio. Starting at the bottom of the figure, when the wife is not entitled to her own benefits, household benefits contain the husband's retired worker benefits, spouse and survivor benefits. Since she cannot receive spouse benefits until he claims, we see a fall in SSW after age 65 as the loss in worker and spouse benefits outweigh the increase in survivor benefits that arises when claiming is delayed. When her PIA is larger than half of her husband's PIA, the increase in SSW between ages 62 and 65 is due to survivor benefits increasing faster than his worker benefits are falling. However, after he turns 65, his benefits fall more drastically so this decline offsets the increase in survivor benefits.

Women and Social Security

Given the large increase in the labor force participation of women, and the dramatic narrowing of the gender wage gap, we might presume women are more self-sufficient when they reach old age. With these increases in labor market activity, women are more independent of their husbands in determining their economic well-being while of working-age. This increase also has been shown to increase bargaining power in household financial decision-making. Due to Social

[5] Those using 3% include Liebman et al (2009), Mastrobuoni (2007), and Coile et al (2002).

Security rules, wives are still dependent on husbands in old age. The first channel of dependence is wives may not begin claiming the spouse benefit until the retired worker claims his own benefit. The second channel is eligibility for a survivor benefit after one's spouse passes away, equal to the deceased individual's retired worker benefit. Even while women have increased their labor force participation (LFP) and received higher wages, chances are good that their husbands will work more years, between maternity leave and child rearing, and will receive higher wages. As a result, most women end up relying on one if not both types of these benefits.

One direct result of the increase in female LFP is the increase in the fraction of wives eligible for their own benefit. Figure 3 presents the fraction of female recipients by type of benefit received. There has been an increase in the fraction of women eligible for their own benefit over the past 50 years. In 1940, less than half of women recipients of Social Security were eligible for their own retired worker benefit, with fewer than 40 quarters of covered earnings. Almost three-quarters of current female beneficiaries are eligible to receive a benefit based on their own work history. However, the fraction of women still receiving dependent benefits is still over 50%. Mostly these are women receiving survivor benefits, as only 20% of female beneficiaries receive spouse benefits. From 1940 through the early 1990s, the fraction of women receiving spouse or survivor benefits hovered around 60%. Only since the mid-1990s has this fraction begun to fall.

Looking more closely at these female beneficiaries, I ask how reliant these women are on spousal and survivor benefits. Using official SSA data, I compare the benefits received by female dual beneficiaries, those eligible for both their own and spouse or survivor benefit, to those she would have received due to only her own retired worker benefits. As this ratio approaches 1, women will be no longer dependent on their husbands for the specific benefit. Figure 4 shows the ratio increasing from 1995 to the present for those that are receiving spouse benefits. However, there was an initial decline from 1986 to 1995, probably due to a change in sample composition. As more women are eligible for benefits, the average lifetime earnings will fall as the newly eligibles have lower lifetime earnings. If the inflow to the sample from the bottom of the earnings distribution is larger than the outflow of women who are no longer dependent on spouse benefits, we would expect to see this fall suggesting greater dependence on spouse benefits. This is likely true for the earlier period, as it coincides more with the beginning of the female labor force revolution. We do not see an analogous fall and rise for survivor

benefits. The most likely explanation for this is beneficiaries receiving survivor benefits are an older cohort than those receiving spousal benefits. Therefore, we would expect a rise in the future as women with stronger worker histories begin to receive survivor benefits[6].

Related Literature

There is not a large literature on Social Security benefit claiming so this review will highlight the few results on claiming and also discuss a few relevant studies of the retirement response to Social Security incentives.

Claiming

Arguably the most complete study of claiming to date, Coile et al (2002) present results of a financial maximization for a married couple where the wife is not entitled to her own benefit and for a single male. Their results highlight the role of longevity, earnings history, discount rate, and age difference with wife in determining optimal claiming age. All but earnings history play a central role in determining the age which maximizes household SSW. In addition, they present a simple utility model for single men who have already retired to make predictions about the impact of wealth and risk aversion on the claiming decision. Their regression results suggest that claiming behavior is generally consistent with the predictions of financial maximization and utility maximization, at least in the cross section[7]. Important to know as we move forward is that the presence of risk aversion [value of insurance provided by Social Security] increases the optimal age from the maximizing SSW benchmark. Sun and Webb (2009) also find this role of risk aversion as their analysis expands the work of Coile et al (2002) to include married couples and wives eligible for their own benefit. Their results suggest the presence of a working wife does not change the conclusion that husbands should delay longer due to the value of the annuity provided.

Sass et al (2007) is similar in spirit to this study. Their goal is to evaluate why married men claim their benefits so early. They propose two theories, caddishness and ignorance. First, they calculate the optimal claiming delay for couples in Health and Retirement Survey (HRS)

[6] Another factor that would impact these facts is any changes in the correlation between mortality of the husband and wife might cause different patterns for spouse and survivor benefits if the trends are different for high- and low-wage women.

[7] They look at correlations in the data using multivariate regression.

and focus on the fact that the loss from early claiming is felt primarily through the survivor benefits. To evaluate their hypotheses, they use demographic characteristics, measures of financial knowledge, and questions about household decision-making from the HRS to see if either of these theories can be confirmed. They find the only measures of educational attainment are correlated with claiming at age 62. This could be consistent with an ignorance story but does not confirm either of their hypotheses.

More recently two studies have looked at the claiming response to incentives. Panis et al. (2002) aim to predict the behavioral impacts of a change in the early entitlement age (EEA) or NRA, including the impact on the claiming decision. Their claiming model estimates the response to option value (OV) [option value of utility to be gained by delaying] and peak value (PV) [option value of financial gain from delayed claiming] measures, in addition to a multinomial OV to incorporate disability claims. Their focus is predicting claiming behavior if the Social Security rules changed further. They estimate the response of both retirement and claiming to Social Security incentives and find claiming is more responsive to incentives than retirement[8]. The second study is Mastrobuoni (2009) who aims to look at the impact of the introduction of Social Security statement (SSS) on knowledge and retirement[9]. His interest lies in the behavioral change after the introduction of information. He uses the SSS introduction as a natural experiment approach for identification to look at how information impacts knowledge of benefits and the response to incentives. In his base model, a $1,000 increase in accrual decreases the hazard rate by 0.74 percentage points[10]. This is similar to Panis et al's (2007) results using HRS. He is the first, to my knowledge, to allow the response to incentives vary by observable characteristics[11]. Allowing the response to incentives to vary by marital status and whether wife is independent or dependent, he finds that husbands whose wives are independent are more responsive to incentives. He expects those whose wives are dependent to be more responsive which is not what he finds[12]. His rationale is households with dependent wives are paid more benefits from the husband's earnings record and therefore he expects this group to be more

[8] Their control function contains quartics in potential earnings and AIME.
[9] An early version of this paper uses claiming as the dependent variable while subsequent versions use retirement.
[10] These results are from the early version (2006) which uses claiming as a dependent variable.
[11] Chan and Stevens (2008) allow the response to private pension incentives to vary between those that understand the incentives and those that do not.
[12] He defines dependent as couples with a PIA ratio below 0.5, and independent as couples with a PIA ratio above 0.5.

responsive to incentives. The results show prior to the Statement introduction those with independent wives were more responsive than those with dependent wives, but after the introduction they respond the same.[13]

Retirement

Many studies over the past few decades have sought to understand the role of Social Security in retirement decisions. I will not review the entire literature but only mention two recent studies. Coile and Gruber (2007) investigate the role of Social Security financial incentives on the retirement decision. They use a variety of incentives measures on HRS data. The primary challenge in studying the retirement response to Social Security benefits is the variables that determine Social Security incentives, a function of work history, will also impact the retirement decision likely creating omitted variables bias. They demonstrate the wide range of incentive values in the data and show measures of work history only can explain about half of the variation in household incentive measures. They find retirement responds to all measures of Social Security incentives and highlight the importance of taking into account the full option value instead of the annual gain, whether measured in terms of utility or dollars.

More recently, Liebman et al (2009) thoroughly investigate both the intensive and extensive labor supply response to Social Security *work* incentives. They only allow changes in benefits due to continued work not delayed claiming. They look at the response to both intensive and extensive tax rates using earnings or hours and retirement, respectively. In order to be more confident that their estimates are driven by the discontinuities in benefit formulas and are free of bias from individual heterogeneity, they develop an in-depth approach to identifying the optimal control function before proceeding to their final estimation. This allows them to compare individuals on each side of the discontinuities created by the Social Security benefit rules in a framework with uncertainty. They reject the hypothesis that labor supply is completely unresponsive to the Social Security incentives.

[13] The incentives are larger at most ages for those with 'dependent' wives, but it is not clear why men should respond to $1000 increase in the household SSW differently.

III. Data

The data utilized is an administrative dataset which merges (1) a pared down version of the Survey of Income and Program Participation data from the 1990s (1990-1993, 1996), (2) the Summary Earnings Records (SER) and Detailed Earnings Records (DER) from the Internal Revenue Service, and (3) the Master Beneficiary Record (MBR) from the Social Security Administration. This project has been housed at the Census Bureau. The project's goal was to merge a few demographic variables to the administrative data. In most cases, administrative data is missing this key information. Since not all individuals from the SIPP can be matched to administrative data, missing values are imputed to the final data. Four different imputations are performed, and final estimates must average the four sets of results and calculate standard errors to account for the imputation. These files are referred to as the Gold Standard data. Details on this process are specified in Abowd et al (2006).

Synthetic versions of the data are made available to researchers for analysis, while the final analysis must be performed at the Census Bureau by government employees. The variables on the synthetic files are synthesized to protect the anonymity of the individuals, but "should reproduce characteristics of the underlying confidential data". There are 16 implicates of the data, and we can think of each as a dataset of imputed values. Estimates from the synthetic implicates are averaged for final estimates from the imputed data. Calculation of the standard errors takes into account the imputation process (Abowd et al, 2006). This is a new type of data set and an additional value of this analysis will be to evaluate how well the data implicates perform. The synthetic implicates do not reproduce the claiming distribution very well as they smooth over claiming spikes at ages 62 and 65. Despite this shortcoming, estimates of the baseline model from the synthetic data is very similar to results from the Gold Standard files.

This data is nearly ideal for the current study. Included in the data are birth date, OASDI claiming date and type of initial benefit, marital history, death date, earnings history, and a link to current spouse. It is possible to determine whether men were married at the time of claiming, regardless of his current marital status. This is important because we do not want to treat a man who was married as single as we will misrepresent the incentives he faced. It is also necessary to determine who received disability benefits prior to age 62 since they faced a different situation than those deciding when to receive retired worker benefits in old age. I will not include the DI recipients in the analysis of claiming behavior. The sample used for analysis includes all males

born between 1922 and 1940. Those born prior to 1922 faced different Social Security rules, making calculations from the available data impossible. The last year we observe claiming is 2002. The youngest cohort is born in 1940, and they reach their EEA in 2002. I am able to include them in the analysis since we observe the decision to claim at 62, even if I cannot observe actual claiming date for the entire birth cohort.

The sample contains 13,753 men who received retired worker benefits as their initial benefits from OASDI. In addition to this group, there are an additional 1,384 who appear eligible for Social Security but have not claimed benefits yet[14]. Table 1 contains summary statistics for the analytical sample . The average lifetime retired worker benefits are $132,387. Almost 70% of men expect to receive survivor benefits on their records, and about 45% expect to receive spouse benefits. These values are taken when men are 62 years old. Approximately three-quarters were married when they claimed retired worker benefits and about one quarter of men exited the labor force before turning age 62. On average, wives are 3.9 years younger than their husbands. Finally, we also trim outliers that look like data errors, those who have wives more than 40 years older (10 observations) or those who have PIA ratios above 50 (5 observations)[15].

Figure 5 graphs the empirical claiming distribution of all men in the sample, both single and married. As reported in official data, almost half of men claim benefits as soon as they are eligible. Due to a technical rule, most individuals are not eligible until they are 62 years and 1 month old. Furthermore, we see another spike at age 65 with very few individuals claiming after this age. One quarter of men claim at ages 64 and 65, while less than 5% claim after they turn 65.

A question underlying this analysis is whether the presence of a wife and her benefits causes different behavior. If singles claim in similar patterns to married men, we would predict the presence of dependent benefits plays no role in the claiming decision. Evidence from Coile et al (2002) suggests claiming differences by marital status are not consistent with financial maximization. Financial maximization predicts that married men should claim later than unmarried men, but they do not find that this holds in the cross section. In a multivariate regression, they find that married men claim earlier than single men. My study will answer whether that is due to the presence of dependent benefits.

[14] This value is taken from the synthetic datasets, not the Gold Standard analysis.
[15] Ibid.

Benefits lost

Before turning to more formal analysis, I want to document the implications of actual behavior. For each couple I compare the potential benefits available to the household to the expected paid benefits. For potential benefits, we calculate the husband's claiming age which maximizes household SSW. This data is the best available to perform this exercise. Most datasets do not include full earnings history for both spouses, and those that do, such as the matched HRS, are significantly smaller. Sass et al (2007) calculate optimal delay for husbands and wives but they are only able to calculate a PIA ratio for only 141 couples[17]. In contrast, the data has over 10,000 matched couples and have both earnings histories needed to calculate the PIA ratio. Figure 6 graphs the distribution of the claiming age which maximizes household SSW for married men. These values are taken at annual intervals due to anonymity concerns from the Census Bureau. Other than the cohort variation in the rules, the PIA ratio and differences in age difference between spouses provide the remaining variation to determine the SSW maximizing claiming age. Assuming wives claim as soon as possible, more than 60% of husbands should claim at age 65 to maximize household SSW. This is primarily due to the less than fair delayed retirement credit (DRC) for older cohorts. The DRC has been increasing beginning with those born in 1925 but does not reach a more actuarially fair level until the 1939 cohort. The gain to delay past age 65 is very small for older cohorts. For cohorts with the most favorable DRC, there is very small mass of those whose SSW maximizing claiming age is at the NRA. Less than 10% of husbands should claim before age 63, far less than the observed 50% seen in Figure 5[18].

Looking back at Figure 5, the empirical claiming distribution, we do not observe a concentrated mass in the center of the distribution as would be expected if men were maximizing SSW. Since it appears unlikely financial maximization of household SSW is a large part of the claiming decision, we want to know what are the costs associated with actual claiming behavior. Do husbands not maximize SSW because the costs are not large? Who bears the majority of any penalty? I next look at how much money is left on the table as a result of early claiming[19]. Sass et al (2007) explore this question for the HRS. I am able to broaden the sample to include older cohorts. I first look at how much household wealth is "lost" due to early claiming. I compare the

[17] Their study also requires labor force exit prior to age 62.
[18] More detailed results about predicted sample behavior is available upon request.
[19] I use the term "claim early" to refer to behavior not maximizing SSW. Obviously, there are individuals claiming late who should claim early, but overwhelmingly, the reverse occurs.

maximum available SSW and benefits received as a result of actual behavior. We then break the total loss into the various components: worker, wife and survivor benefits.

Figure 7 graphs the distribution of total benefits lost for married couples. About 20% of couples lose at least $5,000 and about 5% lose at least $20,000 (in 2003 dollars). This may not seem like a large loss, but the numbers hide two key points. First is who bears the burden and second is what does this mean in terms of monthly benefits. To answer this question, I group the benefits in the following way: (1) husband's retired worker benefits, (2) spouse benefits + wife's retired worker benefits received while husband is alive, and (3) survivor benefits + wife's retired worker benefits received while husband dead. The rationale for this grouping is that spouse and survivor benefits are substitutes for the wife's retired worker benefits. To see why consider couples where the wife's PIA is approximately half of her husbands. If it is slightly less than half, she would want to receive the spouse benefit once eligible, since 0.5*Husband PIA is larger than 0.49*Own PIA. If her PIA is slightly larger than half of her husband's PIA then she would not want to receive spouse benefits. In both cases, the total amount of benefits paid to the household will be the same. These couples are nearly identical and I want to treat them as such. The same logic holds for survivor benefits. I refer to benefits paid to the wife while her husband is alive as "wife benefits" and benefits we expect to be paid to the wife after her husband dies as "survivor benefits".

Figure 8 graphs the distribution of benefits lost by type of benefit [worker, "wife", and "survivor"]. The distribution for lost wife and survivor benefits only include couples that expect to receive each type of benefit given their age difference and PIA ratio. More than three quarters of husbands are gaining in expected worker benefits due to choice of claiming age, compared to the benefits he would expect to receive if he maximized the household SSW. These extra worker benefits are not large, with approximately 5% gaining more than $5,000 in expected lifetime worker benefits. One potential explanation for this finding is the majority of husbands respond only to their own benefit incentives. Most husbands would maximize their worker benefits if they claimed between ages 62 and 63. However, due to the actuarial adjustment, there is not much variation in lifetime benefits between claiming at any point age 62 and 65 for men with the average life expectancy. This is by construction. The Social Security program was designed so lifetime benefits would be similar for the average worker regardless of when he claimed benefits. Since the SSW maximizing delay for most husbands is around age 65 to maximize household

benefits and between ages 62 and 63 to maximize own benefits, we see husbands slightly gaining from their choice of claiming age[20].

Since worker benefits are not largely affected by the choice of claiming age, wives must bear the majority of costs associated with early claiming. About one-third of wives lose more than $5,000 in expected lifetime survivor benefits, while more than 5% lose more than $10,000. It is difficult to conceptualize how big these numbers are in a practical sense because they take into account probability of individuals being alive at every year in the future. To get a better grasp of the costs, I compare the survivor benefit received under actual husband behavior and hypothetical behavior. Figure 9 graphs survivor benefits for three different scenarios. The first is given actual claiming behavior. The second and third are potential survivor benefits, the first at the age which maximizes SSW and the second if the husband claims at age 68. Given actual claiming and assuming the husband passes away after the widow turns 65, approximately 25% of widows would find themselves living below the poverty line if she had no other income[21]. In contrast, if husbands claimed at the age that maximized household benefits, less than 20% would be below the poverty line. If he claimed at age 68, typically later than the age that maximizes SSW, less than 15% would be in poverty. The implications for widows are serious. Not all widows rely solely on Social Security for their income but for many Social Security plays a large role, particularly at the lower end of the income distribution. In 2008, almost half of unmarried female beneficiaries, including widows, received more than 90% of their income from Social Security (Social Security Administration, 2010).

IV. Empirical analysis

The empirical approach estimates a reduced form model of claiming. Given the question of this analysis is how the Social Security claiming decision responds to the gains from delaying benefit claiming, I regress an indicator for claiming on Social Security incentives. Most studies calculate household SSW and used the resulting incentives as the key independent variable. There are two measures of financial incentives, peak value (PV) and accrual (ACC), used in

[20] It is important to keep in mind that these values are for average life expectancy. If an individual believes he will die sooner than average, he should claim benefits earlier and as a result will attain greater lifetime benefits than if he delayed.

[21] Annual threshold for the aged determined by the Census Bureau. http://www.census.gov/hhes/www/poverty/histpov/hstpov1.html

studies of the retirement response to Social Security financial incentives. In general, they measure the financial gain from delaying claiming from period *t* to some future period. ACC compares SSW in *t* to SSW in *t+1*, where PV compares the value today to the value at its maximum. Coile and Gruber (2007) developed the PV measure as an alternative to the option value measure developed by Stock and Wise (1990) but remains the same in spirit[22]. By delaying today, one retains the option to claim benefits at a later date. SSW and the incentive measures are defined by the household benefits paid both from husbands' and wives' earning histories. A drawback to financial measures is that they do not account for the disutility of work, an important feature when considering retirement incentives but less of an issue in this setup with the focus on claiming not labor supply. Mastrobuoni (2010) uses ACC since after age 62, PV is monotonic, while Panis et al (2002) use PV. He argues it is important to measure the annual change, since two individuals with the same peak value could face much different short-term incentives but estimates models with each.

An additional advantage to the ACC measure is it is straightforward to compare across all individuals and across all types of benefits. When comparing two individuals, we know that ACC is comparing the annual change. When using PV we do not know when the maximum value occurs for these two individuals without additional information. This unknown maximum, *when* is not captured by the PV measure, proves to complicate the calculation and comparison for the benefit specific incentives. For a given individual, there could be three different ages that maximize each type of benefit. We know the age that maximizes worker benefits is between age 62 and 63, the survivor benefit is maximizes around age 70, and the age which maximizes wife benefits varies by age difference and PIA ratio. We defined SSW as the sum of Husband's worker benefits, wife's benefits, and survivor benefits, but this linearity will not hold for the PV measure, i.e. PV of household will not equal the sum of the individual benefit PV. However, the linearity *will* hold for the accrual measure.

$$ACC_{SSW} = ACC_{worker} + ACC_{wife} + ACC_{surv}$$

I present results using both PV and ACC for the base model, but focus the remaining analysis on the accrual measure for this reason.

[22] Warner (1978) used a concept called Cost of Leaving (COL) which is analogous to the PV measure.

Focusing on the household incentives implicitly assumes husbands take into consideration the total household benefits when making their claiming [or retirement] decision. Stated differently, husbands are indifferent between types of benefits received by the household over all points in time, regardless of whether he is alive when the benefits are received. This may be a strong assumption. Much variation in household benefits is in terms of the survivor benefit, which the husband may not weight as heavily as benefits received while he is alive. After noting this, it makes sense to consider each benefit separately. I break expected household SSW into its components and define incentive measures for each type of benefit. The key contribution of this study is measuring incentives and the behavioral responses to these measures in a piece-wise approach. It seems plausible that husbands are more sensitive to their own benefit, or at least more sensitive to benefits received while alive. I will compare results controlling for the household incentives to results controlling individual benefit incentives to see which model describes observed behavior better. I want to evaluate whether behavior is consistent with treating all benefits equally. If this were the case, the coefficients on each type of benefit would be equal, and this value would be equal to the coefficient on the household incentives in the alternate model. For this reason, it makes the most sense to focus on the accrual measure due to the linearity mentioned earlier.

When looking for suitable variation to identify the response to Social Security incentives, there is significant heterogeneity in household incentives. Much of this heterogeneity is driven by eligibility for different types of benefits: worker, spouse or survivor. The remaining cross sectional variation comes from earnings differences and changes in mortality between cohorts. The analytical framework will combine the work of Coile and Gruber (2007, CG07 henceforth) with Liebman et al (2009). CG07 seek to estimate the impact of SS incentives on retirement. They acknowledge the determinants of SSW are likely correlated with the retirement decision and must control for this endogeneity. To address this, they use a control function whose primary components are quartics in AIME and potential [lagged] earnings of both the individual and their spouse. Liebman et al (2009) are more explicit than CG07 in describing rules from the benefit formulas that drive model identification. They also use a control function approach but are more methodological about its construction.

Two channels can impact the PIA as the claiming decision is delayed. One is due to the change in PIA due to continued work, where a high earnings year replaces a low earnings year[23]. The other is due to the actuarial adjustment of benefits. Liebman et al (2009) use the former source for identification since they focus on the labor supply incentives for retirement. I have done the reverse. Since claiming is the outcome variable, I feel it is important to use the corresponding financial incentives. Most papers combine the two channels but it is important use the appropriate incentives for each decision. Therefore, this study holds PIA fixed while changing the actuarial adjustment, focusing only on the incentives caused by a change in the claiming age not continued work. Separating the response to each channel, which come from different parameters of the Social Security system, will also be informative for reform. Hopefully, we will learn about which incentives individuals respond to.

Identification of the model comes from two difference sources. Variation in incentives comes from the interaction of the couple's PIA ratio and age difference. This interaction will create non-linearities in benefits around thresholds associated with "eligibility" for spouse and survivor benefits[24]. Figure 10 shows the variation in incentives that have been used for identification used by most retirement studies. This shows how varying the PIA of the wife changes the incentives husbands face. It is easy to see how the variation in total incentives can be attributed to the spouse and survivor incentives. This is additional motivation to use the incentives associated with each benefit separately.

Omitted variables bias is less of a concern in a model of claiming than in a model of retirement unless claiming is a one-to-one mapping of retirement. In a model of retirement, the factors that determine incentives [measures of earnings history] play a direct role in the retirement decision. Furthermore, the concern for unobserved heterogeneity should be less of a concern when looking at the claiming decision instead of retirement since we have less uncertainty in incentives than studies of retirement since our sample is at least age 62.[25] However, I want to be confident the estimates are driven by variation uncorrelated with individual heterogeneity. I use a control function approach like Coile and Gruber (2007),

[23] AIME is an average of the highest 35 years of earnings. If next year's earnings are expected to be greater than the lowest earnings year included in AIME, then the PIA is expected to increase.

[24] Liebman et al (2010) are able to rely on discontinuties because they focus on the tax-benefit link and are not considering all household benefits.

[25] Most studies of retirement consider samples of individuals who are at least 50 years old or at least 55 years old.

Liebman et al (2009), and others. The premise is to include all variables use to calculate incentives. I use the same interactions included in Coile and Gruber (2007) but add additional measures used by Liebman et al (2009). Following Liebman et al (2009), I also include lagged earnings back to age 30 of the worker and his spouse and quartics of ln(SSW). In addition, I include quartics of ln(Worker benefits), ln(Wife benefits) and ln(Survivor benefits). This does not exactly duplicate the full control function used in their study but captures the main components and allows for more flexibility in terms of the different benefits[26].

The other source of identification is due to parametric changes in the Social Security benefit formulas. This source of identification has been use previously by Song and Manchester (2007), Kopczuk and Song (2008), and Mastrobuoni (2007) among others. There are two different types of changes. The first is an increase in the normal retirement age. It is gradually increasing from age 65 to 67 beginning with the cohort born in 1938. The second change is an increase in the delayed retirement credit from 3% per year to 8% per year beginning with those born in 1925. Both of these changes increase the return to delaying retirement, at different points in the claiming distribution. To illustrate, consider a husband born in 1937 who claims his benefits at the EEA. He receives 80% of his PIA as a monthly benefit[27]. An individual born in 1938 receives 79.17% if he claims at age 62 and 0 months and someone born in 1939 receives 79.33%. It is akin to multiple natural experiments phased in over time. For the DRC, someone born in 1924 would receive 103% of his PIA if claimed at age 66 but someone born in 1935 would receive 106% of his PIA if he claims benefits are claimed at age 66. Most studies that rely on this variation for identification are strictly reduced form since data analyzed do not allow the full calculation of household incentives since spouse information is unavailable. These policy changes also apply to the wife's claiming age. Changes to her benefit calculation will impact both the level of spouse and survivor benefits. This provides additional variation due to the wide range of female cohorts in the sample.

Focusing on the accrual measure, where variation is not driven by differences in the SSW maximizing age, much of the identification of the spouse and survival accrual will come from changes to the wife's NRA. The actuarial adjustment to both benefits is a function of the wife's birth year. The variation in rules among wives will create variation in the exact level of benefits.

[26] The HRS contains more measures of labor force behavior like tenure and detailed occupation and industry.
[27] This is true only for those who are born on the 2nd of the month. For everyone else, their EEA is 62 and 1 month so they receive 80.55% of their PIA as a monthly benefit if they claim at their EEA.

Age difference between spouses will vary the importance of spouse and survivor benefits. Those with the youngest wives will have the largest weight on survivor benefits while those with older wives have a larger weight on the spouse benefit. Starting at age 65, the husband's DRC will provide additional variation in the survivor incentives.

Since more than financial considerations may determine claiming age, I also include other factors we believe will determine the claiming decision separate from financial considerations. They are education, marital status, work-limiting disability, experience and its square, household wealth including square and cubic, and observed mortality. I control for age using dummy variables. This allows for the value of leisure to change over time while accounting for any possible focal points associated with claiming or retirement at different ages. It should also help address sample selection issues that may arise if those in the sample for longer are fundamentally different from those who claim at age 62.

Most studies of retirement make some assumptions about claiming. This study of course is forced to make its own assumptions. I assume claiming is independent of the retirement decision. This appears to be a strong assumption given most men who retire after age 62 retire and claim within a 12-month period.[28] If claiming is merely a response or a part of exiting the labor market, I would expect a weak response of claiming to financial incentives. This would be likely unless claiming is picking up the retirement response to incentives. Since I only use incentives from the actuarial adjustment and not the incentives associated with labor supply, this should be less of a concern. Holding PIA fixed at age 62 to isolate the role of actuarial adjustments will understate gains to any claiming delay. I estimate the models on a sample that exited the labor force by age 62. While there still may be some coordinating between retirement and claiming for this group, we would expect the bias from a retirement response to be muted. This will also allow us to evaluate the extent of the bias by comparing the results from the full sample and the early retiree sample.

Results and Discussion

[28] Coile et al (2002)

Table 2 presents the results from the baseline model for two different samples. The first is all men born 1922 to 1940 and the second is those who retire by age 62[29]. The table reports the coefficients from a linear probability model with claiming as the dependent variable. For the base model, I present the results for both PV and ACC. The top panel presents results from the PV models while the bottom panel presents the results from the ACC model. I also present results for overall incentives in models (1) and (4) to highlight what the approach used in the literature is lacking and to allow comparison to previous work. These models use the household incentives like the previous literature and do not find a strong claiming response to the household incentives. The coefficient on the ACC measure in (1) suggests a $1000 increase in maximum household SSW leads to a 0.2 percentage point reduction in the claiming hazard. This is roughly consistent with Mastrobuoni (2006) who finds no response to annual accrual in benefits for early retirees. This group only faces incentives due to the actuarial adjustment and no changes to PIA; the incentives used here are identical to those used in his early retiree model. For some individuals, household incentives include only worker benefit incentives. For others, the incentives are a combination of worker, spouse, and survivor benefits. Recognizing this fact makes it harder to interpret results that estimate the response household incentives.

In the remaining models, I find a strong negative response to the incentives from the retired worker benefit. In model (2), a $1,000 increase in worker incentives will reduce the hazard rate by 4.6 percentage points using the PV model and a fall of 2.5 percentage points in the ACC model. These results suggest a stronger response to the total benefits to be gained instead of the annual gain. Focusing on the ACC models would presumable present a lower bound to the response to PV incentives. There is no response to the incentives from either wife or survivor benefits. Models (3) and (6) combine the household and worker incentives in one model so we are able see in one setting which measure is more important in determining male claiming. These results are consistent with the preceding models. Claiming behavior responds strongly to the worker incentives but not to any other incentives including those defined by household benefits. This is the primary message to be taken from this study. It is important to allow for the response to vary by type of benefits, for controlling for the overall incentives seems to hide a true behavioral response.

[29] I define early retirees as those whose last year containing earnings is the year in which they turn 62. Since earnings are an annual measure, we are unable to exactly determine if individuals have exited the labor force before their 62nd birthday.

In the second set of columns, we do not se a response to worker incentives for early retirees. There are economic arguments to be made why early retirees may be more or less responsive to incentives. It would not be surprising if they were more responsive as this group has been able to fund retirement prior to Social Security benefits. They may be more able to respond to incentives since they are not credit constrained; they were able to fund retirement prior to age 62. When these individuals reach age 62, they face strictly a financial decision of when to claim benefits. However, they could follow a rule of thumb to claim as soon as benefits are available since they are not making a joint claiming and retirement decision. Furthermore, the early retirees are not credit constrained and therefore, Social Security benefits are likely a smaller portion of their annual income. If this is the case, maximizing SSW may not be a high priority. There still is little or no response to incentives determined by household, spouse or survivor benefits. I am unable to determine if these estimates from the early retirees are a cleaner response to incentives and the presence of the retirement decision caused bias in the original models or if this subsample has no response to claiming incentives for other reasons mentioned above.

Before concluding husbands do not consider wife or survivor benefits when making their claiming choice, there are a few potential explanations we want to explore first that might allow us to identify populations who respond to the other benefit incentives. The first is health. Since the expected lifetime is a major component of the claiming decision, we expect that responses to incentives will differ along health dimensions. Hurd et al (2004) and Delavande et al (2006) find those with low mortality expectations claim benefits slightly earlier than those who think they have a good chance of living to age 75. Ideally, I would like to take this one step further and ask whether the response to incentives vary by mortality expectations. Unfortunately, I do not have measures of mortality expectations like the HRS. Instead, I use ex post mortality since it is likely to be correlated with private information held by the individual that would inform their mortality expectations. I break the sample into two groups based on whether they die before reaching their 75^{th} birthday. Before looking at results, we want to have an idea of what we expect differences to be by health. Those who do not live as long receive benefits over fewer years. As a result, claiming early maximizes the lifetime benefits of those with worse mortality prospects. We would predict those in poor health [low mortality expectations] would respond less to the financial incentives. I look at this in two manners. The first is interacting the

response to incentives with a dummy variable for whether the individual lives past his 75th birthday. This approach will identify whether the two groups respond differently to the average incentives for all individuals. Since incentives are more accurate for those who live to age 75, I estimate the model on a subsample for of individuals with better mortality outcomes. These results should be less prone to measurement error. We can see if removing this source of bias has a significant impact on our conclusions.

Table 3 presents the results allowing the response to incentives to vary by mortality by age 75. In column (1), a $1000 increase in SSW over the next year would reduce the hazard by 0.5 percentage points with no statistically significant difference for those who live longer. In column (2) we see that men are still responsive to their own benefits with again no difference by observed mortality. I previously noted that those with average mortality do not experience a large variation in worker benefits by claiming age. Taking this into account, it may be plausible that the long-lived group can be more responsive to dependent benefits with little cost in terms of their own benefit. The sign on the interaction between living past 75 with the survivor and spouse incentives is negative as predicted but insignificant and very small in magnitude when compared to the coefficient on the worker incentives. The coefficients on observed mortality of self and spouse are generally positive and insignificant. These are only proxies for mortality expectations so we should not read too much into the lack of results. Even as proxies, we would have expected a negative coefficient. These results are supported by model (4) with the coefficient point estimate on worker incentives larger than in the full model. There are no other qualitative differences in the results from these two different approaches. Given the results in column (4), it appears measurement error may attenuate the coefficient estimates on worker incentives towards zero but this does not appear the case for either wife or survivor benefits.

A primary concern when estimating behavioral responses is whether individuals understand the program we are analyzing. I implicitly assume individuals understand the rules when I estimate the response to incentives. Chan and Stevens (2008) note that it is puzzling how strong the estimated behavioral response to pensions is given that most individuals do not have a full understanding of the incentives. Given the complicated rules of the Social Security program it is reasonable to ask how well individuals understand the program. Leibman and Luttmer (2009) do just this. They find the median voter knows more than we think but that the spouse benefit provision is not well understood. This finding could explain the lack of economic

meaningful results concerning dependent benefits from the base model. Allowing for individual information is impossible given the data, but I look at whether those we expect to have more information respond to incentives differently. The best option given the constraints of our data is to look at those with the most education[30]. They have the best chance of understanding the incentives or gathering the information.

Table 4 allows the response to incentives to vary by whether the husband has at least a college degree. We find that those with a college degree are slightly more responsive to the worker incentives but no more responsive to spouse and survivor incentives than those without a college degree. While this is what we predicted, it still does suggest that even those with less education respond to incentives and do understand the benefits and incentives to some degree. My concern was only part of the population understood the benefit rules and would respond to incentives but this does not appear to be true using educational attainment as a proxy for information. We do find that those with more education do claim later as would be expected. I also estimate the split model for only those with a college education. This group might have an effective discount rate in line with our calculations so we would like estimates again less susceptible to measurement error. The results are fairly consistent with models (2). The estimated coefficient on worker incentives is slightly smaller than the sum of the overall and interaction coefficient from models (2) and (3).

The last potential explanation I want to explore is joint leisure. Over the past twenty years, joint retirement has been documented for working couples and the importance of joint leisure has been stressed. Valuing joint leisure could be a potential explanation why men claim benefits early. If their wife is at home, they might want to retire and claim as soon as possible. Directly evaluating the role of joint leisure is difficult, but at the very least, men may respond less to financial incentives if their objective function weights joint leisure highly. I break couples into three different groups based on wives' work history. Although this is far from perfect, it will help us determine if joint leisure could be driving our base results. The first group is couples where the wife has a very weak work history, less than ten years of any earnings over her lifetime or is not eligible for retired worker benefits[31]. For wives with more than ten years of

[30] I do use the cohort-differences created by the Social Security Statement utilized by Mastrobuoni (2009) as a robustness check on the synthetic data. Consistent with his findings I do not find any meaningful difference in behavior after the dissemination of information.

[31] Those claiming their own retired worker benefit include dual beneficiaries.

positive earnings and who is eligible for her own benefit, we have one group where the wife is still in the labor force and the other where she has exited the labor force[32]. Approximately 20% of wives fall into the latter category while 40% fall into the former. Studies of joint retirement are limited because they only consider couples where both spouses have a strong work history or were both in the labor force at some age, say 55. Examining claiming behavior does not face this constraint. If she is not in the labor force, he may be more inclined to claim benefits or at least may be less responsive to incentives. I want to evaluate whether allowing for joint leisure eliminates the response to financial incentives or if only certain groups respond to incentives. The models are estimated for married men only; the omitted category is husbands whose wives have a weak work history. Table 5 presents results allowing for claiming and the response to incentives to vary by the three groups defined above[33]. Starting with the simple group indicators in the bottom rows, we see husbands whose wives have a stronger work history and who are still working are less likely to claim and those whose wives have already exited are no more likely to claim that those whose wives have a weak work history. This is consistent with a role of joint leisure. There is little difference between groups in the response to worker incentives, which is not surprising as his wife's labor force behavior does not impact his benefits. Again we see no response to spouse or survivor incentives. This leads us to conclude that joint leisure probably plays an important role in determining claiming age but it does not impact the response to incentives. This is reassuring for our original conclusions.

V. Conclusions

This study highlights the dependence of wives on their husbands for Social Security benefits, even after the drastic increase in labor force participation and wages women have experienced over the past several decades. I explore whether the behavior of husbands is consistent with this dependence. Are men equally responsive to all household benefits, or do they respond to the incentives created by their own benefits more strongly? This is the first study to allow the response to Social Security financial incentives to vary by the type of benefit received by the different members of the household at different points in time.

[32] Alternate measures of claiming or retirement do not yield any indication that joint leisure plays a role in claiming decisions.

[33] These results are averages from the synthetic data. These models will be run on the Gold Standard data shortly.

My findings suggest husbands do not treat all benefits received by the household equally. I find men are very responsive to their own benefits, but not very responsive to the incentives created by dependent benefits. It seems they are more responsive to spouse benefits than survivor benefits although my findings cannot reject in most cases that he treats them equally. I estimate models trying to elicit whether responses are driven by certain segments of the population who either respond more to financial incentives or for whom the incentives are calculated more accurately. I find those who live longer are responsive to the incentives from spouse benefits but at a much smaller magnitude than the response to his own benefits. Those with the most education are more likely to claim benefits later but those with all levels of education respond to the incentives. In addition, joint leisure appears to play a role in determining claiming age, but like education does not negate the response to incentives throughout the population.

Widows' well-being is partially determined by the claiming decision of her deceased spouse. In the case of survivor benefits, claiming age of the husband can increase the benefits by up to 50%. We do not see evidence of behavior consistent with husbands prioritizing the survivor benefit. There is a chance some of this discrepancy could be due to better understanding of own benefits, as noted by Liebman and Luttmer (2009), but it is unlikely that this is the sole explanation. Future cohorts may be more responsive to all benefits as they will receive the Social Security statement for longer, and maybe as a result will learn more about survivor benefits. As it currently stands, the Social Security statement does not provide much information about either spouse or survivor benefits, so this is one avenue for information dissemination. In addition, policy circles have talked about trying to disentangle the wives' benefits from their husbands' behavior due to the substantial impact of husband's claiming age on survivor benefits. Given the results of this study, this may be an avenue to more seriously consider.

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Figure 1. Expected Lifetime Retired Worker Benefits by Claiming Age, Men

Figure 2. Expected Household Social Security Wealth (SSW)

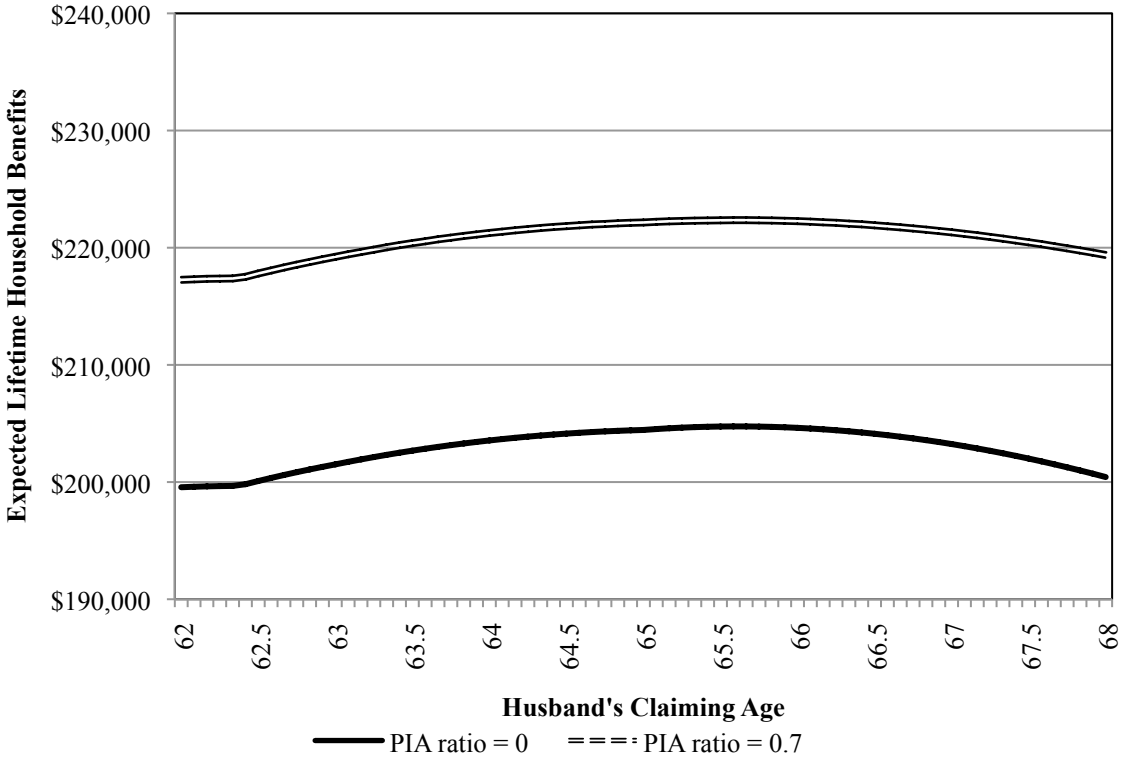


Figure 3. Current Female OASI recipients, Type of Benefit

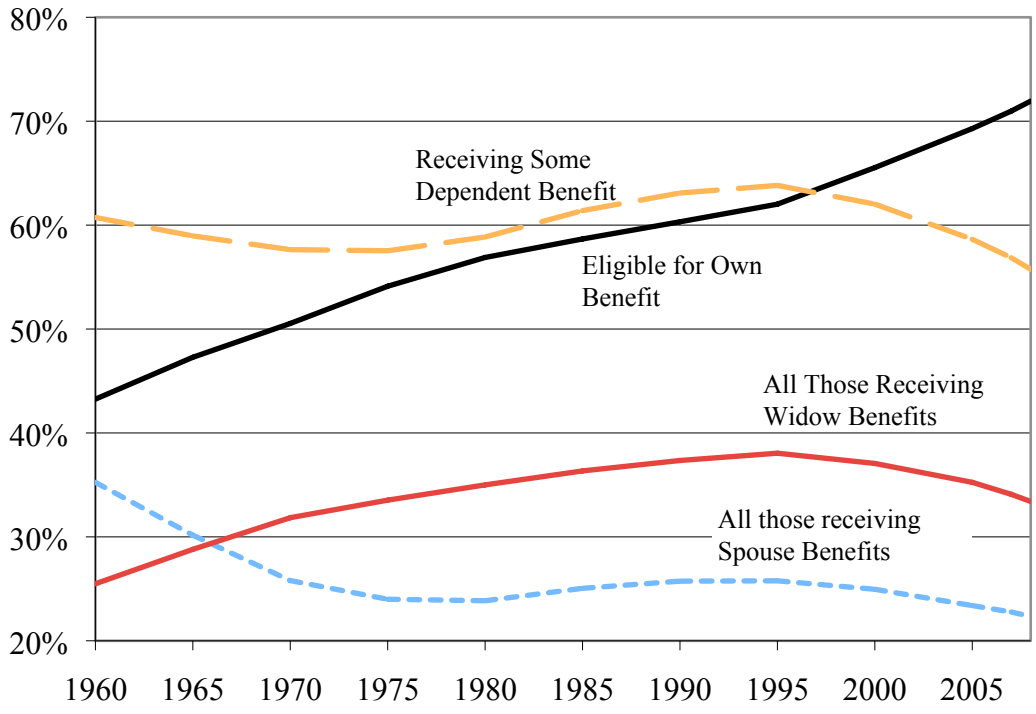


Figure 4. Fraction of Total Benefits Due to own PIA, Female Dual Beneficiaries

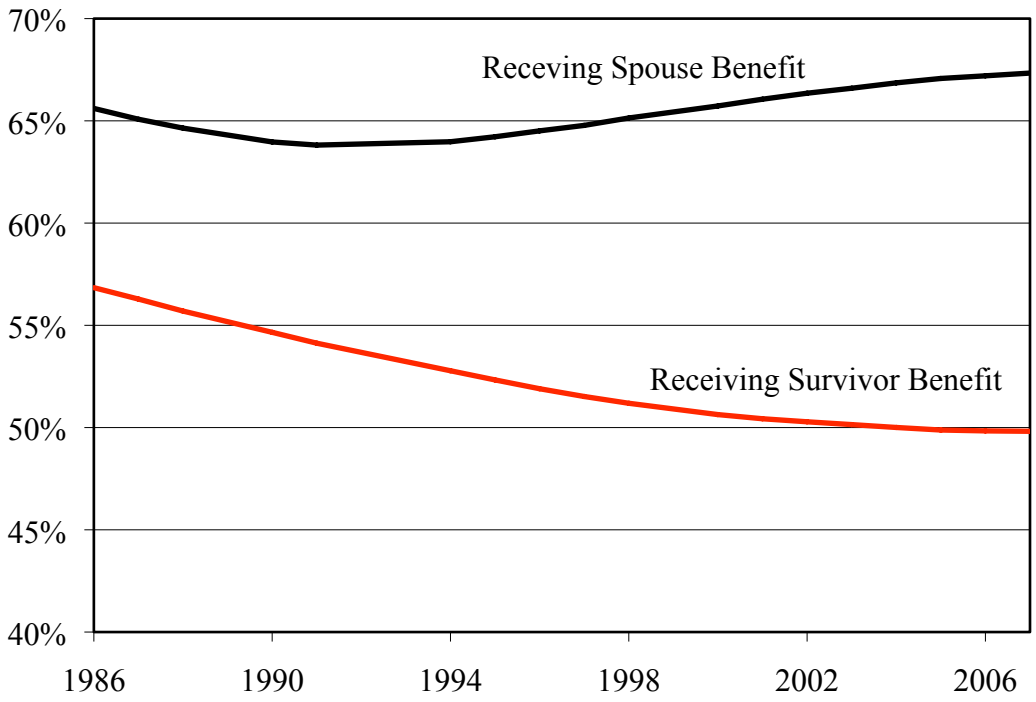


Figure 5. Empirical Distribution of Claiming Age, Men by Marital Status

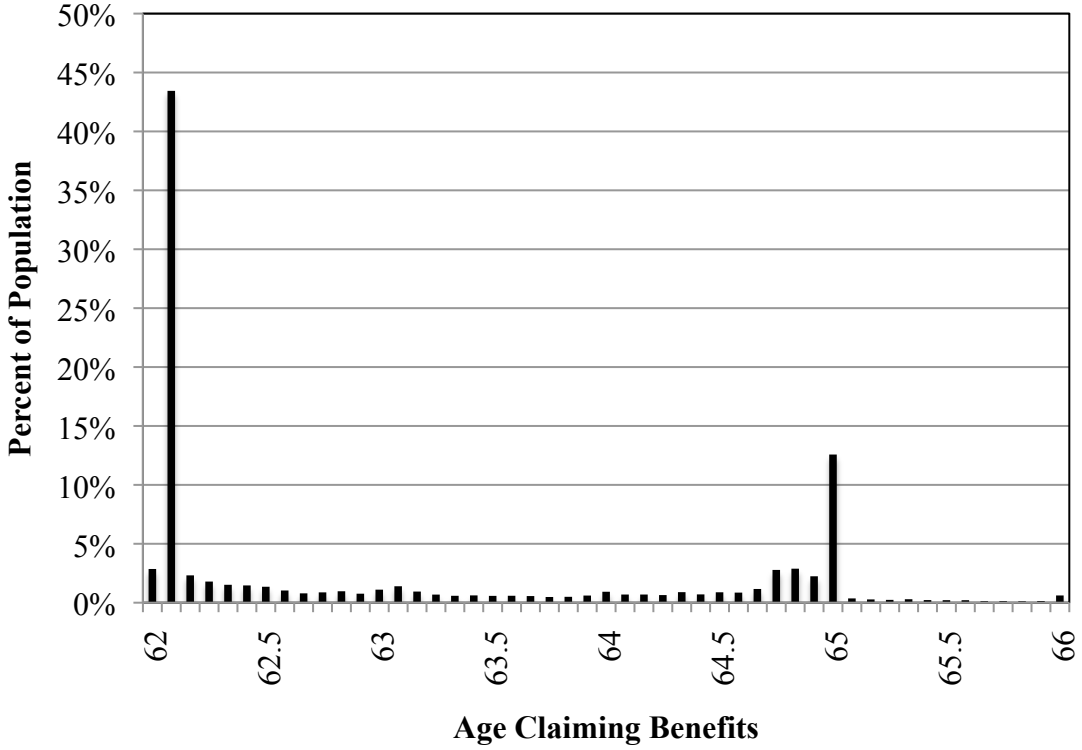


Figure 6. Distribution of Claiming Age that Maximizes Household SSW

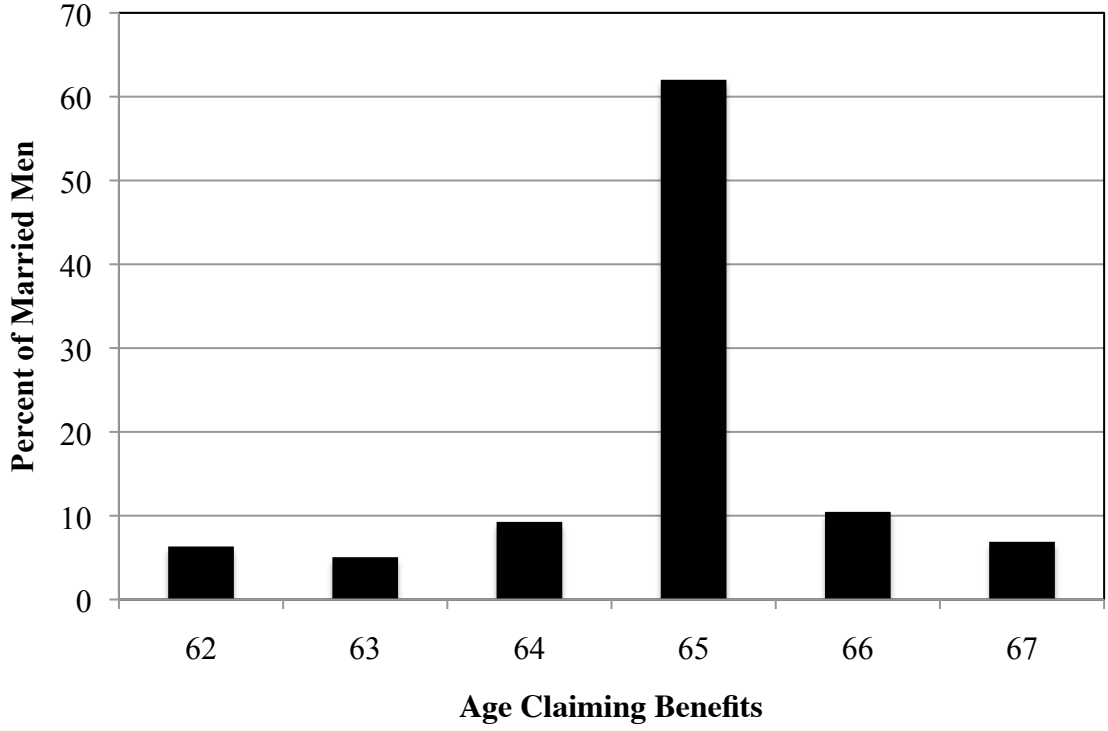


Figure 7. Distribution of Total Household Benefits Lost
Maximum SSA Benefits Less Actual Expected Benefits

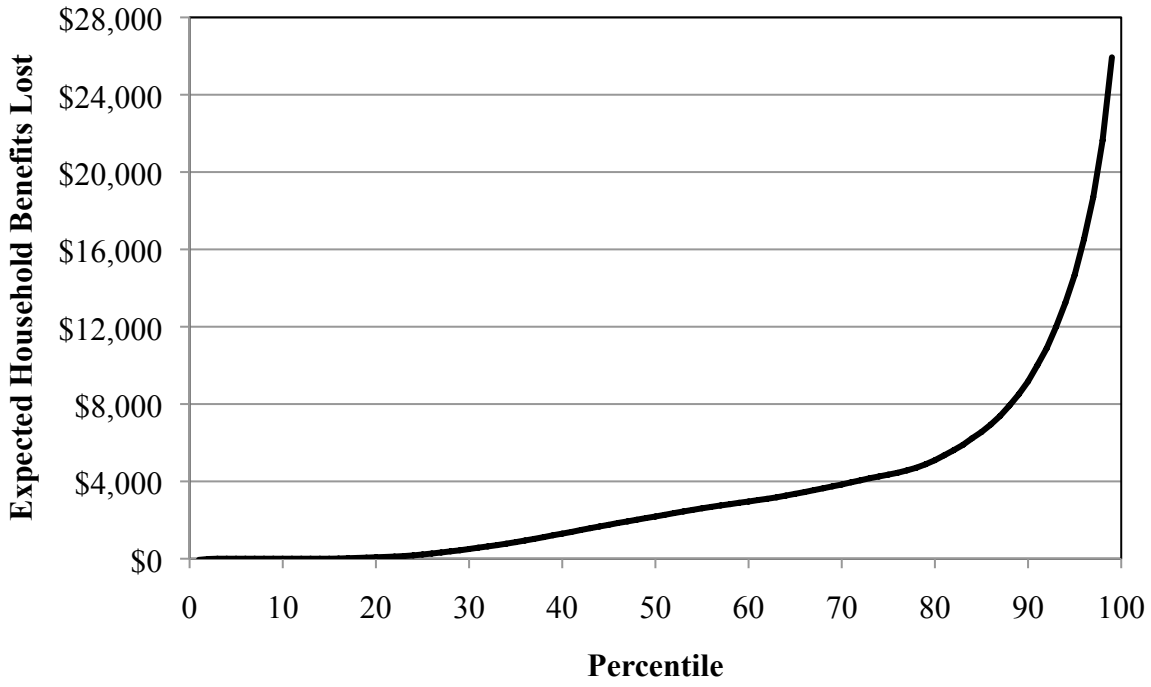
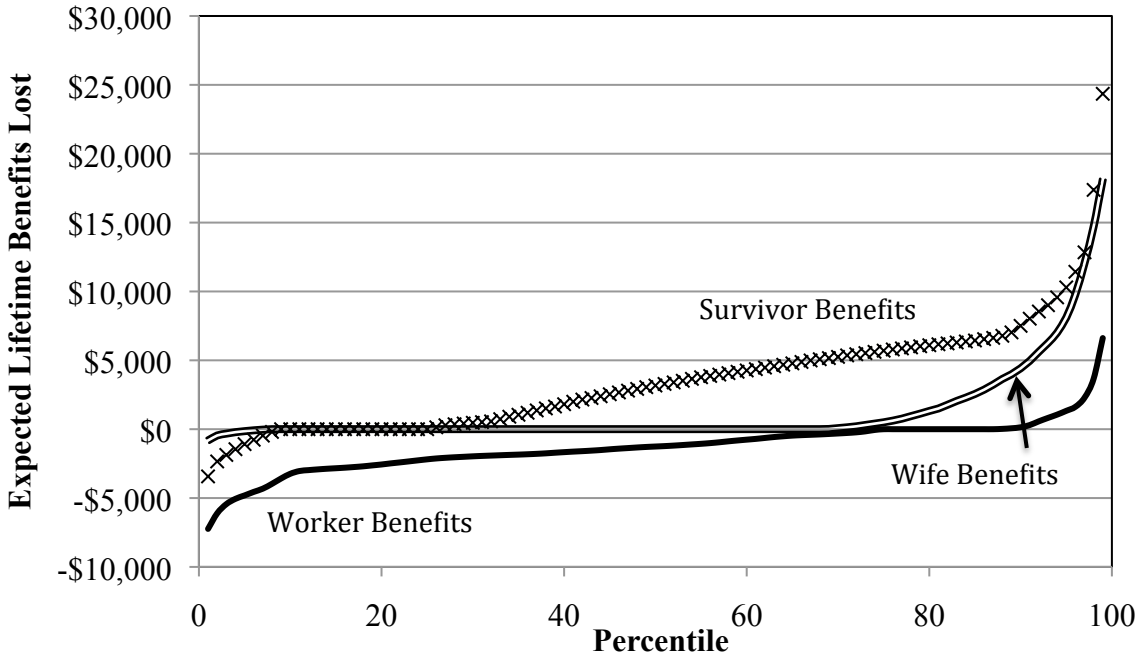


Figure 8. Lifetime Benefits Lost, By Type
Maximum OASI Benefits Less Actual Expected Benefits



Note: Maximum Benefits are defined by the claiming age that maximizes the sum of wife & husband's worker benefits, spouse, and survivor benefits.

Figure 9. Actual and Potential Survivor Benefits

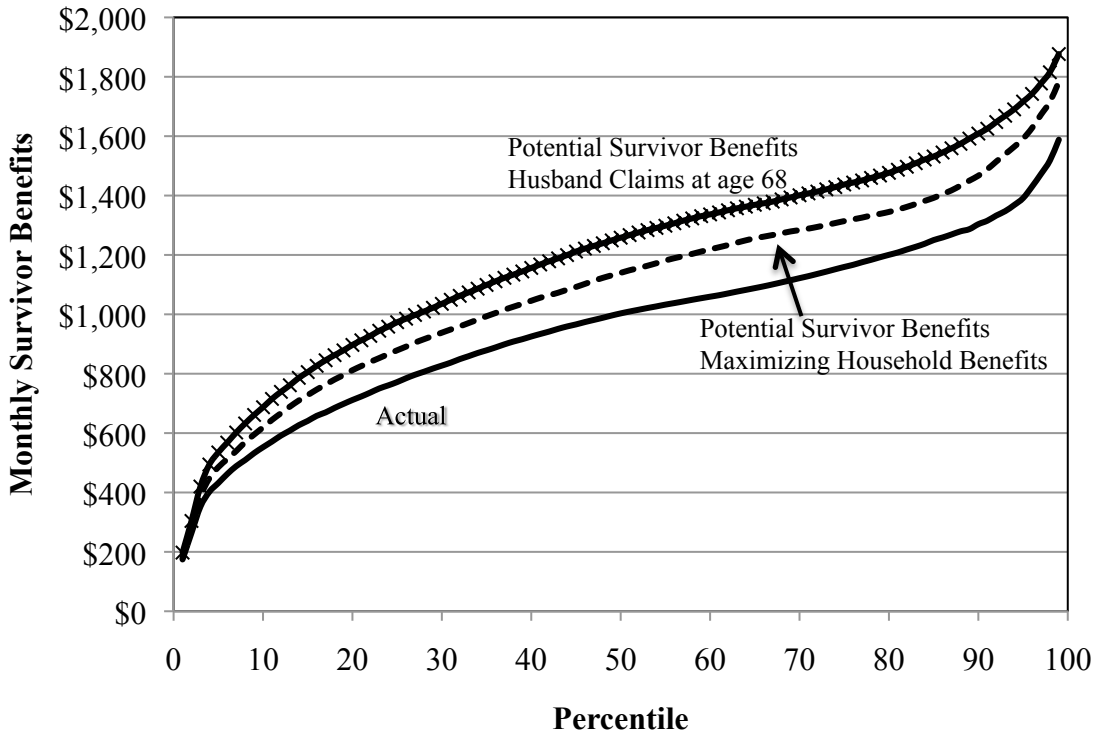
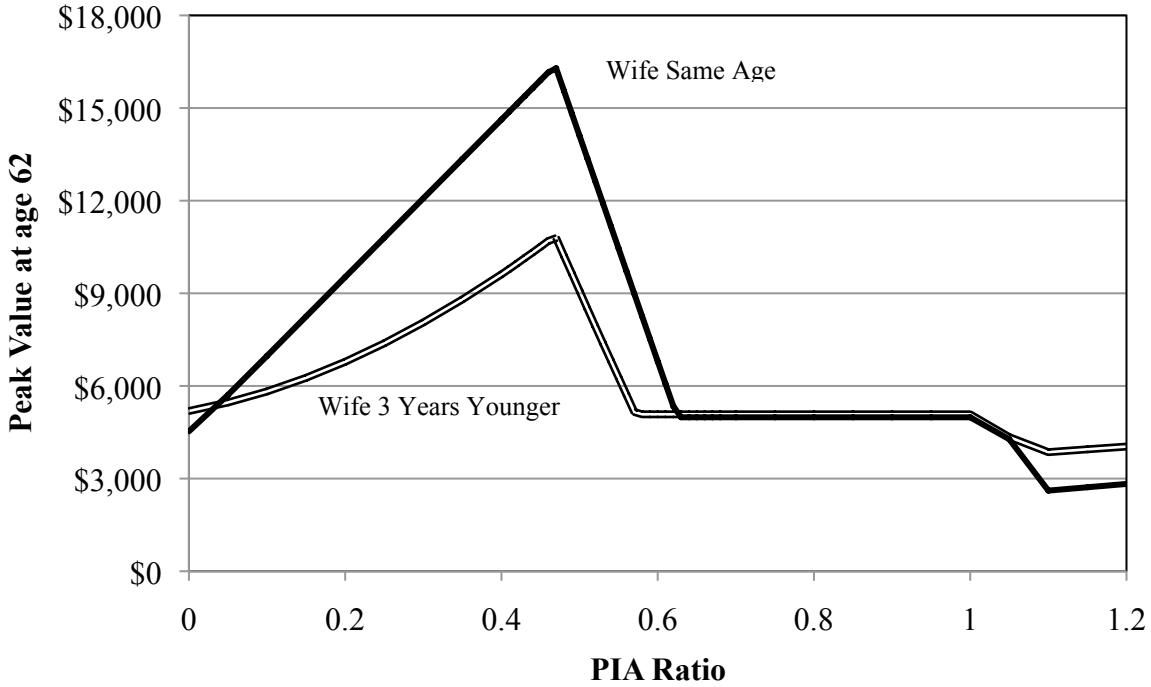


Figure 10. Household Peak Value, by PIA ratio and Age difference between Spouses



Note: PIA Ratio is the ratio of Wife's PIA to Husband's PIA

Table 1. Summary Statistics

	Mean	Std. Deviation
Expected Worker Benefits	132,387	42,515
Fraction Expecting Spouse benefits	0.4690	0..4983
Expected Spouse Benefits	21,612	25,428
Fraction Expecting Survivor benefits	0.6920	0.4209
Expected Survivor Benefits	36,877	28,167
Peak Value - Worker Benefits	110	107
Peak Value - Spouse Benefits	1,887	3,460
Peak Value - Survivor Benefits	11,317	9,880
Age Difference Between Spouses	3.88	5.55
Total Net Worth	370,958	739,495
Fraction Claiming Single	0.2431	0.3944
Fraction with at least College Degree	0.2892	0.4286
Fraction Retiring prior to age 62	0.3212	0.4486
Years with earnings before claiming	27.98	9.02
Years with earnings before claiming - Spouse	15.17	13.76
Health Limits Work	0.1699	0.3234
Health Limits Work – Spouse	0.1977	0.3524
# Individuals	13,753	

Table 2. Baseline Model

	Full Sample			Early Retirees		
	(1)	(2)	(3)	(4)	(5)	(6)
Peak Value - Household	0.0001 0.0004		**0.0004** 0.0004	**0.00004** (0.0005)		**0.0001** (0.0005)
Peak Value – Worker		**-0.0463***** (0.0044)	**-0.0465** 0.0044		**-0.0057** (0.0106)	**-0.0054** (0.0106)
Peak Value – Wife		**0.0018**** 0.0008			**0.0007** (0.0011)	
Peak Value - Survivor		**0.0002** 0.0006			**0.0004** (0.0008)	
Accrual-Household	**-0.0018***** 0.0006			**-0.0010** (0.0011)		**-0.0024** (0.0036)
Accrual-Worker		**-0.0250***** 0.0024			**-0.0028** (0.0058)	**-0.0010** (0.0011)
Accrual - Wife		**0.0000003** 0.000002			**-0.000001*** (0.000003)	
Accrual - Survivor		**-0.0003** 0.0008			**-0.0008** (0.0011)	
# Observations		27,042			16,466	
# Individuals		13,753			7,716	

Source: Averaged values from 4 completed data implicates from Gold Standard data. Standard errors are calculated as detailed in Abowd et al (2006).

Note: Population mortality tables used in calculation of incentives. Control variables in each model are age dummies, education, interactions of quartics of AIME and potential earnings, own and spouse earnings starting at age 30, experience and its square, death after age 75 of self & spouse, death after age 80 of self & spouse, years since retirement (if retired), presence of work limiting disability, presence of DB/DC pension, net household wealth up to its cubic, and log(SSW), log(Worker Benefits), log(Spouse Benefits) and log(Survivor benefits) up to their cubics.

Table 3. Results by Husbands' Ex Post Mortality

	(1)	(2)	(3)	(4)
Sample	Full	Full	Full	Those who live to at least age 75
Accrual-Household	**-0.0048*** ** 0.0018		**0.0002** 0.0007	
*Death after age 75	**-0.0008** 0.001		**-0.0025** 0.0013	
Accrual – Worker		**-0.0296*** ** 0.0026	**-0.0297** 0.0026	**-0.0388** 0.0044
*Death after age 75		**0.00003** 0.0019	**0.0013** 0.0021	
Accrual – Wife		**0.000002** 0.000003		**0.000002** 0.00001
*Death after age 75		**-0.00001** 0.00001		
Accrual - Survivor		**-0.0002** 0.0009		**-0.0012** 0.0013
*Death after age 75		**-0.0019** 0.0015		
Death after age 75	**0.0136** 0.0142	**0.0098** 0.0120	**0.0103** 0.0120	n/a
Spouse's death after age 75	**0.0057** 0.0149	**-0.0004** 0.0100	**-0.0004** 0.0100	**0.0032** 0.0189
# Observations		27,042		10,511
# Individuals		13,753		3,867

Source: Averaged values from 4 completed data implicates from Gold Standard data. Standard errors are calculated as detailed in Abowd et al (2006).

Note: Control variables in each model are age dummies, education, interactions of quartics of AIME and potential earnings, own and spouse earnings starting at age 30, experience and its square, years since retirement (if retired), presence of work limiting disability, presence of DB/DC pension, net household wealth up to its cubic, and log(SSW), log(Worker Benefits), log(Spouse Benefits) and log(Survivor benefits) up to their cubics.

Table 4. Results by College Education

	(1)	(2)	(3)	(4)
Sample	Full	Full	Full	College Graduates
Accrual - Household	**-0.0013*** (0.0008)		**-0.0007** (0.0008)	
*College	**-0.0001** (0.0011)		**0.0016** (0.0013)	
Accrual – Worker		**-0.0230***** (0.0024)	**-0.0227***** (0.0025)	**-0.0201***** (0.0003)
*College		**-0.0040***** (0.0014)	**-0.0048***** (0.0015)	
Accrual – Wife		**-0.000002** (0.000003)		**0.000002** (0.000004)
*College		**0.000006** (0.000004)		
Accrual – Survivor		**-0.0008** (0.0010)		**0.0004** (0.0011)
*College		**0.0013** (0.0014)		
College	**-0.0352** (0.0079)	**-0.0497** (0.0089)		n/a
# Observations		27,042		
# Individuals		13,753		3,846

Data: Averaged values from 4 completed data implicates from Gold Standard data. Standard errors are calculated as detailed in Abowd et al (2006).

Note: Control variables in each model are age dummies, education, interactions of quartics of AIME and potential earnings, own and spouse earnings starting at age 30, experience and its square, years since retirement (if retired), presence of work limiting disability, presence of DB/DC pension, net household wealth up to its cubic, and log(SSW), log(Worker Benefits), log(Spouse Benefits) and log(Survivor benefits) up to their cubics.

Table 5. Results by Wife's Labor Force History

	(1)	(2)	(3)
Accrual – Household	**-0.0014**		**-0.0004**
	(0.0041)		(0.0024)
*Wife Strong LF, Exited LF	**0.0013**		**0.0019**
	(0.0028)		(0.0029)
*Wife Strong LF, Still Working	**0.0001**		**0.0015**
	(0.0030)		(0.0026)
Accrual – Worker		**-0.0192**	**-0.0184*****
		(0.0036)	(0.0041)
*Wife Strong LF, Exited LF		**-0.0052**	**-0.0062**
		(0.0040)	(0.0043)
*Wife Strong LF, Still Working		**-0.0052**	**-0.0002**
		(0.0036)	(0.0028)
Accrual – Wife Benefits		**0.000002**	
		(0.0002)	
*Wife Strong LF, Exited LF		**0.00006**	
*Wife Strong LF, Still Working		**0.00001**	
		(0.0004)	
Accrual – Survivor		**-0.0001**	
		(0.0023)	
*Wife Strong LF, Exited LF		0.000002	
		(0.0018)	
*Wife Strong LF, Still Working		**0.0019**	
		(0.0019)	
Wife Strong LF, Exited LF		**-0.0102**	**-0.0039**
		(0.0230)	(0.0206)
Wife Strong LF, Still Working		**-0.0304*****	**-0.0301*****
		(0.0099)	(0.0101)
# Observations		23,199	
# Individuals		11,417	

Source: Averaged values from 16 synthetic data implicates from Synthetic SIPP data. Standard errors are calculated as detailed in Abowd et al (2006).

Note: "Wife Strong LF" is wives who have at least 10 years of positive earnings and are eligible for their own retired worker benefit from SS.
Control variables in each model are age dummies, education, interactions of quartics of AIME and potential earnings, own and spouse earnings starting at age 30, experience and its square, years since retirement (if retired), presence of disability, presence of DB/DC pension, net household wealth up to its cubic, and log(SSW), log(Worker Benefits), log(Spouse Benefits) and log(Survivor benefits) up to their cubics.