

# **Mortality Risk and Household Insurance in the U.S.**

Itzik Fadlon, *University of California, San Diego and NBER*

Shanthi Ramnath, *U.S. Department of the Treasury*

Patricia Tong, *RAND Corporation*

*Preliminary Report to the Social Security Administration*

*Do not circulate pending final clearance from the authors*

Acknowledgement/disclaimer: This research was supported by the U.S. Social Security Administration through grant #RRC08098400-09 to the National Bureau of Economic Research as part of the SSA Retirement Research Consortium. The findings and conclusions expressed are solely those of the authors and do not represent the views of SSA, the U.S. Department of the Treasury, RAND Corporation, or the NBER.

## 1. Introduction

The death of a primary earner is among the most devastating shocks that households face and it poses a major source of economic risk for American families. The social insurance program that aims to protect against the income losses imposed by this shock—namely, Social Security’s survivors insurance—has become one of the largest safety-net programs in the United States. In 2014, the U.S. government paid \$93 billion to more than 4.2 million surviving spouses; where, by comparison, unemployment and Earned Income Tax Credit benefits amounted to \$46 and \$60 billion, respectively (SSA 2015; White House 2015). Yet, we know surprisingly little about American families’ exposure to financial risk from these extreme shocks or about how they respond to compensate for the associated income losses. Moreover, to the best of our knowledge, there is virtually no direct evidence on the economic effects of Social Security’s survivors insurance or on the degree to which it protects the financial well-being of American households.

Using tax records that cover the entire U.S. population, we study the impact of mortality shocks on American families, and we identify the causal effects of Social Security’s survivors insurance on households’ behavior and economic circumstances. From a panel that spans the years 1999 through 2011, we analyze close to a quarter of a million affected households. The data, which include a range of financial outcomes, provide us with the distinct advantage to investigate aggregates of economic well-being as well as households’ behavioral responses through different channels of self-insurance, such as family labor supply and private savings. To study the financial consequences of spousal death, we utilize the timing of death shocks to construct counterfactuals for affected households using households that experience the same shocks but a few years later. Then, to estimate the economic impacts and insurance value of Social Security’s survivors benefits, we exploit a sharp discontinuity in the age at which surviving spouses become eligible for transfers. We leverage the scope and detailed nature of the data to investigate financial outcomes and behaviors of households that fall just below and just above the age cutoff in the immediate years following spousal death.

We analyze the effects of mortality shocks by studying women between the ages 50 and 70 whose husbands died in the years 2002 to 2007. We focus on women since within our period and sample cohorts, they tend to be secondary earners and to live longer, so they are more likely to be financially vulnerable to spousal death. We first characterize the aggregate equilibrium by combining all households irrespective of whether the widow is eligible for Social Security benefits. Studying a general measure of financial well-being that assesses net overall household income, we find that American families experience meaningful losses following spousal death. In per capita terms, income falls by \$5,500 annually which represents a decline of 12%. However, in contrast to common view, the analysis reveals that there is significant

insurance through different channels, which shrink the potential income loss that would occur in their absence by 70%. On average, self-insurance through spousal labor supply plays a small role, and the largest share of operative income compensation is attributed to self-insurance in the form of payments from households' retirement savings accounts and to social insurance in the form of payments from Social Security.

While we find that Social Security transfers act as an important compensation channel in equilibrium, this result alone cannot speak to the impacts of the program nor to its insurance value. Such analysis requires identifying the causal effects of government transfers which evaluates behaviors and outcomes compared to a counterfactual world in which no transfers are provided. The Social Security scheme allows us to conduct this experiment by relying on a sharp discontinuity in its survivors insurance benefit schedule: widows become eligible exactly at age 60 for their deceased husbands' potential Social Security retirement benefits.

Exploiting this eligibility-age discontinuity, we find that the program has significant impacts on the financial security and welfare of American households. First, we find that eligibility leads to a net increase of \$5,291 in annual household income. Notably, there is minimal benefit crowd out: on average, every \$1 of benefits transferred translates to a \$0.93 increase in actual family income. Second, eligibility for survivors insurance leads to meaningful declines in self-insurance through widows' labor supply, resulting in greater consumption of leisure by insured households. Together, these findings point to a high valuation of Social Security's survivors insurance by American families in terms of the protection it provides, which implies important welfare gains generated by the program. Our analysis is also informative for welfare costs and net gains, as it points to important income (vs. substitution) effects in family labor supply behavior.

Lastly, we assess the degree to which Social Security's survivors benefits insure those who are eligible. The evidence suggests that "just eligible" households with widows of ages 60-61 are close to fully-insured. Their decline in household-level income falls within the compensation benchmark of adult equivalence scales and they display no increase in labor supply, consistent with no residual need for self-insurance. However, in line with our estimated effects of the program, households that are "just ineligible" (widows of ages 58-59) display significant financial vulnerability. They exhibit significantly larger declines in household income and respond with non-negligible increases in labor earnings. This provides an argument for potentially expanding the coverage of Social Security's survivors benefits across ages, thereby limiting the adverse financial circumstances of many American households that are still exposed to substantial risk from spousal death.

## **2. Data and Institutional Background**

### **2.1. Data Sources and Analysis Sample**

We use administrative tax data on all American households for the years 1999 through 2011. The data include both income tax returns (e.g., Form 1040) and information returns filed by third parties (e.g., Form W-2, Form 1099-SSA, Form 1099-R). Since information returns are available for both filers and non-filers, these data allow us to characterize total income for all widows in our sample. From the income tax returns, we extract adjusted gross income (AGI) and marital status. AGI includes earnings, capital income, retirement income, taxable Social Security benefits, and adjustments for above-the-line deductions. From the information returns, we extract wage earnings (using Form W-2), Social Security benefits paid from either the retirement or the disability trust funds (which are reported separately on Form 1099-SSA), unemployment benefits (using Form 1099-G), and distributions from private retirement accounts (as reported on Form 1099-R). We observe exact dates of birth and death using SSA administrative records.

Based on these data, we define overall household income as the net family income available from any reported source. For income-tax filers, this measure includes AGI, tax-exempt interest, and nontaxable SSA income; for non-filers, the measure includes wages, unemployment benefits, and gross SSA income. By construction, we exclude contributions to retirement savings accounts.

For the event study analysis, we rely on a 20% random sample of men who died between the years 2002 and 2007 and who were married in the year prior to their death. Spousal linkages are established through filing a joint tax return. We then restrict the sample to the surviving widows who were between ages 50 through 70 in the year their spouse died, which allows us to focus on the age range around the Social Security survivors insurance eligibility age of 60. For this sample, we extract data for the time window that spans the three years before and the three years after the event. In the post-shock years, we include zeros for the deceased spouse to represent changes in outcomes at the household level.

For the analysis of the impact of Social Security's survivors insurance, we use the universe of widows whose husbands died in the years 2002-2007. In this sample, we include outcomes from the years just after the shock (periods 1 and 2) to study the insurance value of the program. To focus on the eligibility cutoff of age 60, we analyze outcomes of widows who at the time of observation were between ages 55 and 62 (the early eligibility age for standard retirement benefits).

## **2.2. Social Security’s Survivors Insurance Program**

Spouses become eligible for Social Security’s survivors benefits at exactly age 60. Benefit amounts are based on the deceased spouse’s earnings and are calculated as a percentage of his or her potential Social Security retirement benefits. Retirement benefits accrue to individuals whose earnings are subject to Social Security taxes. Workers can earn up to 4 credits each year (where, e.g., in 2016, \$1,260 = 1 credit) and individuals are generally required to have 40 credits (10 years of work) to be eligible for retirement benefits.

The percentage of the deceased’s retirement benefits by which the amount of survivors benefits is determined depends on the surviving spouses’ age when they begin to claim benefits. This percentage ranges from 71.5% at age 60 to 100% at the widow’s full retirement age.<sup>1</sup> To be eligible, spouses cannot remarry before age 60.

By design, the schedule of Social Security’s survivors benefits depends on the deceased’s earnings history and does not depend on the survivor’s labor supply. Also, claiming of survivors benefits and its timing do not alter widows’ schedule of own retirement benefits, for which they become eligible at age 62 according to the standard Social Security rules. Therefore, the potential impacts of the program are likely to operate primarily through an “income” effect. Still, similar to retirement benefits, survivors benefits are subject to an earnings test. If survivors claim benefits before their full retirement age, benefits are withheld at a given rate above a certain level of current labor income (e.g., \$16,920 in 2017), but are later paid back in the form of increased benefits. Since research has shown that such benefit adjustments may be perceived as a tax, the earnings tests constitute an element of the program that may create a “substitution” effect. We exploit these features of the program later in the analysis.

## **3. Empirical Framework**

### **3.1. Estimating the Effects of Spousal Death**

To identify the economic impacts of spousal death, we conduct an event study for households that experience a death shock, accompanied by a control group of households from the same cohorts that experience the same shock but a few years later. Based on the time range of the data, we match households that experience the shock 4 years apart, so that our treatment group is composed of women widowed in 2002-2003 and our control group is composed of women widowed in 2006-2007. As the control group

---

<sup>1</sup> An exception to the age 60 cutoff is for disabled survivors, who are eligible for benefits when reaching 50 (at a rate of 71.5%).

becomes “treated” 4 years out, the design allows us to study the effects of spousal death up to 3 years after the shock. With this design, our estimating equation is of the following dynamic differences-in-differences form:

$$y_{i,t} = \alpha + \beta treat_i + \sum_{r \neq -1; r=-3}^3 \gamma_r \times I_r + \sum_{r \neq -1; r=-3}^3 \delta_r \times I_r \times treat_i + \lambda X_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where  $y_{i,t}$  denotes an outcome for household  $i$  at time  $t$ ;  $treat_i$  denotes an indicator for whether a household belongs to the treatment group; and  $I_r$  are indicators for time relative to the assigned shock year, which represents the year of the actual shock for the treatment group and the year of the placebo shock for the control group. The key parameters of interest are  $\delta_r$ , which estimate the period  $r$  treatment effect ( $r > 0$ ) relative to the pre-period  $p = -1$ .  $X_{i,t}$  is a vector of controls that includes age fixed effects and calendar year fixed effects. We report robust standard errors clustered at the household level.

To quantify mean treatment effects, we estimate the standard differences-in-differences equation of the following form, which averages over years before and after the shock:

$$y_{i,t} = \alpha + \beta treat_i + \gamma post_{i,t} + \delta treat_i \times post_{i,t} + \lambda X_{i,t} + \varepsilon_{i,t} \quad (2)$$

In this regression,  $post_{i,t}$  denotes an indicator for whether the observation belongs to post-shock periods. The parameter  $\delta$  represents the average effect of the shock on households’ financial outcomes.

### 3.2. Estimating the Effects of Social Security’s Survivors Insurance

The population level data allow us to lead our analysis with a graphical representation of the results. To focus on the age 60 cutoff, we investigate outcomes for widows between the ages 55 and 62 (the age at which individuals become eligible for retirement benefits). We take advantage of survivors’ exact date of birth and plot each outcome variable of interest by the widow’s monthly age. Since tax information is observed as of December in a given year, age is defined as a person’s age at the end of the calendar year of observation. We analyze outcomes in the immediate post-shock years ( $t = 1,2$ ) as a function of widow’s age in order to study the insurance role of the program.

The source of variation and the data’s annual frequency imply that the full-year exposure effect is captured by widows at age 61. We therefore quantify the effect of the program using the following equation:

$$y_{i,t} = \beta_0 + \beta_1 (age_{i,t} - 60) + \beta_2 \{age_{i,t} > 60\} + \beta_3 \{age_{i,t} > 60\} \times (age_{i,t} - 60) + \varepsilon_{i,t}. \quad (3)$$

In this regression,  $age_{i,t}$  represents a widow's age in months, and  $\{age_{i,t} > 60\}$  is an indicator variable that assumes the value 1 if the widow is observed at an age older than 60. Guided by the graphical analysis, we estimate this equation using the sample of widows between ages 55 to 61, and we include two separate linear trends in outcomes, one for observations before and one for observations after the eligibility age. We estimate the program's treatment effect using the full-exposure impact at age 61, which equals:  $\beta_2 + \beta_3 \times (11/12)$ . For visual clarity, we present figures that plot raw means of outcomes by widow's monthly age and the corresponding estimation of equation (3).

#### 4. The Effects of Spousal Death

As a measure that aggregates households' financial well-being, we begin by investigating the effect of spousal death on overall household income. This measure captures net changes and accounts for a variety of compensating income sources, including earnings, government transfers such as unemployment and Social Security benefits, and distributions from private retirement accounts. Panel A of Figure 1 and column 1 of Table 1 (which estimates equation (1)) display the corresponding results for the effects of a husband's death. On average, households' overall income declines by roughly \$25,000 in the medium run ( $t = 2,3$ ). This translates to a net decrease of \$5,500 when adjusted to per capita terms.

The net decline in household income measures financial circumstances ex-post. However, this decline may include households' behavioral responses that compensate for some of the income loss imposed by spousal death. Studying how households respond to mortality shocks is hence important for our understanding of such self-insurance behavior over the life cycle. Moreover, the degree to which households self-insure through, e.g., family labor supply, is central for the design of social insurance programs. We next study the evolution of different income compensation channels around the event.

First, we analyze the surviving spouses' earnings, as the labor supply of family members is commonly viewed as a key self-insurance mechanism against income shocks. Panel B of Figure 1 and column 2 of Table 1 show that while widows increase their labor supply following the shock, this channel of income compensation plays a negligible average role in practice. In the medium run, total wages (including zeros for non-workers) exhibit a mean increase of only \$350 in response to the death of a spouse.

In contrast, panel C of Figure 1 and column 3 of Table 1 show that there are significant increases in the income flows that households receive through distributions from retirement accounts. These distributions include both income flows from husbands' accounts that have been transferred to widows upon the shock, either as lump sums or as annuities, and income flows from accounts owned by the widows

themselves.<sup>2</sup> Overall, the increase in total taxable distributions amounts to about \$7,250 in the medium run of years 2 and 3 when the flows stabilize.

To understand the dynamics and composition of these significant retirement-income flows, we break them down into two large classes using the distribution codes reported on Form 1099-R. We divide distributions from retirement accounts to those that are directly attributable to spousal death (under the code “death”) and those that may indirectly relate to the event and are at the discretion of the surviving spouse. Panels D and E of Figure 1 and columns 4 and 5 of Table 1 display their different patterns. The spike in the immediate years after spousal death is driven by transfers that are a direct result of the shock. The dynamics of death-related income is consistent with some households transferring the deceased’s retirement account balances as lump sums to wives upon the shock and with some households annuitizing the balances accrued to husbands’ retirement accounts. Payments from the second class of distributions that are not immediately tied to the event also exhibit a prompt increase as a result of spousal death. Notably, they represent an important source of continuous income for widowed households in the post-shock years, amounting to \$4,200 annually. In the medium run, all types of distributions converge to amounts that seem to constitute stable components of the household’s annual income when mortality shocks occur.

Lastly, panel F of Figure 1 and column 6 of Table 1 reveal that significant compensation is provided by Social Security. The annual level of Social Security transfers increases by \$4,700 on average after the death of a spouse. This amount includes both benefits paid to eligible retirees on account of their own earnings history and survivors benefits to age-eligible widows on account of their deceased husbands’ earnings.

To interpret our findings so far, it is useful to mention benchmarks for the estimated dynamics in household income. Following a spouse’s death, the household needs to support one less individual so that insuring the consumption of the surviving members does not require the entire pre-shock level of household income. At the same time, potential economies of scale within the household can make half of a two-person household’s income before the shock insufficient for survivors to maintain their pre-shock utility levels after the shock (see, e.g., Nelson 1988, Browning et al. 2013). The share of the household's income that would keep individuals' consumption utility at its pre-shock level is usually assumed to lie between 0.5 and 1 and is commonly referred to as the adult “equivalence scale”. Some commonly used scales are the modified OECD equivalence scale of 0.67 and the square-root scale of 0.71; so that declines in household

---

<sup>2</sup> Since we are interested in studying changes in actual income, we avoid including balance rollovers to isolate distributions that are paid out in practice.

income following a spousal death on the order of 29-33 percentage points could be interpreted as full compensation.

In our application, we find that the death of a spouse leads to a 40 percentage-point decline in the household's income, which suggests that widows are meaningfully underinsured based on the adult equivalence scales. In fact, even when we take a conservative approach by ignoring economies of scale and by assuming that 0.50 of pre-shock household income constitutes full compensation, we find significant losses. We have seen that the income decline amounts to \$5,500 annually in per capita terms. This finding echoes some commonly raised concerns that American households are underinsured against the death of a household earner, e.g., due to insufficient purchases of life insurance policies.

To further assess the financial hardships of widowed households, we study a measure of insolvency to proxy for economic vulnerability. Specifically, we analyze whether the widow received (under *her* name)<sup>3</sup> the Form 1099-C for "Cancellation of Debt". This form is issued when a debt of \$600 or more has been cancelled/forgiven or when debt balances are not being paid.<sup>4</sup> We find immediate increases in household insolvency, which are economically large compared to counterfactual levels and are present even at the end of our analysis window (panel G of Figure 1 and column 7 of Table 1).

Although we find that American families are underinsured against mortality shocks and are financially vulnerable, our analysis reveals that, in contrast to common view, there is significant insurance that prevents widows from experiencing much larger income losses. This income compensation works through both formal and informal insurance channels: it includes the private self-insurance mechanisms of retirement accounts and labor supply, and the social insurance mechanism of Social Security's survivors benefits. Together, these sources amount to 70% of the potential income loss households would experience in their absence (adjusted to per capita terms). Social Security benefits alone constitute 38% of the compensation in practice, which highlights their importance as a component of widows' income in equilibrium. However, this finding itself is not informative of the causal effect of Social Security benefits, which is the goal of the next section.

## 5. The Effects of Social Security's Survivors Insurance

We now turn to estimate the impact of survivors benefits on widows' labor supply and household income to identify their insurance value to American families.

---

<sup>3</sup> This allows us to avoid including automatic debt cancellations under the deceased's name.

<sup>4</sup> Forgoing debt payments can be also viewed as another informal/implicit source of insurance.

## 5.1. Eligibility Age Discontinuity

We exploit the sharp age discontinuity to study the effect of the program and we leverage the scale of the data to visually display the results. We plot means of the outcomes of interest in monthly frequency for widows of age 55 to 62. In each figure, we superimpose the estimates from the corresponding estimation of equation (3) for a visual evaluation of our parametric assumptions.

*Benefit Claiming.* We begin by looking at the claiming behavior of survivors benefits by widows, which constitutes a “first stage” in our analysis. Panel A of Figure 2 clearly shows a jump in the take-up of benefits as soon as widows become eligible, where the full-exposure effect by age 61 amounts to an increase in claiming of 52 percentage points (column 1 of Table 2). The corresponding pattern in benefit amounts is displayed in panel B of Figure 2. The benefit amount patterns break exactly at age 60 as the increased claiming begins, and reach their full effect in a visually clear way by age 61. At that point, the average increase in benefits (including zeros for those not claiming) amounts to \$5,670 (column 2 of Table 2).

*Household Income.* We evaluate the impact of eligibility for survivors benefits on widows’ overall financial well-being by analyzing our comprehensive measure of household income. Panel C of Figure 2 reveals a clear break in the trend in overall household income immediately when widows become eligible for Social Security survivors benefits. Widows’ annual income then increases at a fast rate until it reaches the full exposure effect by age 61. The *net* increase in income, taking into account potential crowd out in all of our measured margins of self-insurance, totals to \$5,291 (about 11%; see column 3 of Table 2).

*Labor Supply.* Lastly, we investigate how benefit eligibility affects the labor supply of widows, which constitutes an important dimension of household welfare gains from social insurance (Fadlon and Nielsen 2017). In panel D of Figure 2 and column 4 of Table 2, we study widows’ retirement, defined as having positive earnings in the current period but no earnings in the next. There is a clear jump in widows’ retirement hazard as soon as they become eligible for benefits, which averages to a retirement flow of about 2 percentage points within the one-year exposure period when a widow is age 60 to 61 (40% compared to a counterfactual of 5 percentage points).

To estimate how these changes in flows translate to the aggregate labor (“stock”) effect, which is our moment of interest, we plot widows’ labor force participation rates. Correspondingly, by the time widows become fully exposed, their labor force participation declines by 2.75 percentage points, which translates to a decrease of \$1,754 in annual earnings (see panels E and F of Figure 2 and columns 5 and 6 of Table 2).

The results provide two main takeaways which underscore households' valuation of the insurance provided by the government against mortality shocks. First, the causal effect of survivors insurance eligibility on overall household income is significant and exhibits very little net crowd out of benefits: on average, every \$1 of benefits translates to a \$0.93 increase in actual household income.<sup>5</sup> Second, on top of that, the provision of benefits allows widows to meaningfully decrease their labor supply. Hence, Social Security's survivors benefits generate utility gains through both significant increases in household income and increases in the consumption of leisure, suggesting that affected households place a high value on the insurance provided by the program.

## 5.2. Assessing the Degree of Insurance

To gauge the extent to which survivors insurance protects households against the financial burden imposed spousal death, we combine the event study analysis with the age-eligibility design. For this exercise, we pool households that are just below and just above the age 60 threshold at the year of observation, constructing a sample of "just ineligible" widows of ages 58-59 and a sample of "just eligible" widows of ages 60-61. We then estimate the average impact of spousal death within each subsample using equation (2), focusing on overall household income and labor supply.

The results point to a significant role of the program in insuring against spousal death (see Table 3). Households that are just ineligible experience a decline in income of about 41%, whereas households that are just eligible experience a meaningfully smaller decline of 34%. In fact, taking into account economies of scale using the equivalence scale benchmarks discussed earlier, the evidence suggests that eligible households are close to being fully insured on average.

To investigate this point further we analyze the labor supply responses of widows in the two subsamples. In response to spousal death, ineligible widows increase their labor supply by 7%, consistent with a need to self-insure against the income loss imposed by the death shock. However, just eligible widows exhibit no changes in labor supply following the shock. This suggests that self-insurance through labor supply is not required for them, which further supports the view that Social Security's survivors benefits provide close-to-full compensation of income losses among eligible households.

This reiterates the conclusion of the previous subsection from a somewhat different angle. Households' valuation of Social Security's survivors insurance works via two channels: a significant

---

<sup>5</sup> Of course, the exact moment that enters welfare evaluations is consumption. Our income measure aims to proxy for consumption to the degree the data allow by, e.g., excluding investments in the form of contributions to retirement savings accounts. However, other important adjustments are not possible, such as changes in bank account balances.

mitigation of the income loss imposed by the shock, and greater leisure time from decreases in costly self-insurance through spousal labor supply.

### **5.3. Income and Substitution Effects**

Under standard assumptions, declines in labor supply are always favorable from the point of view of a single household, and they therefore represent an important component of the gains from government programs. However, the net welfare consequences from the planner's perspective depend on the degree to which labor supply responses represent an income versus a substitution (or a moral hazard) effect.

Unlike Social Security's retirement benefits, survivors benefits are generally decoupled from own labor supply, so there are presumably no distortions in the incentives to work. In that sense, the estimated effect could be attributed to a welfare-improving income effect. The liquidity provided by the social insurance program attenuates the need to self-insure through labor supply, leading to efficient increases in the consumption of leisure. However, research in the context of retirement benefits suggests that individuals could misperceive the earnings test as income taxation, even though transfer reductions due to the earnings test are paid back to beneficiaries after they reach full retirement age.

We therefore proceed by analyzing a subsample of households for whom only an income effect is likely operative. To do so, we study the labor force participation of widows whose pre-shock earnings were below the earnings test thresholds. The regressions results are reported in Table 4, and the plots for the relevant moments we refer to in this subsection appear in Appendix Figure 1.

Similar to the analysis of the full sample, we find meaningful declines in labor force participation among these households. Widows with labor income below the earnings test threshold exhibit a decline of 2.47 percentage points on a counterfactual baseline of approximately 35. As there is likely no moral hazard component involved in their responses, this points to a substantive welfare-improving increase in consumption of leisure.

It may be useful to compare this response to that of the overall sample as a natural benchmark. To provide a comparison across similar moments, we convert the labor supply effects into elasticities. Specifically, we estimate the percent change in participation divide by the percent change in household income that is attributed to government benefits. We note that this exercise is only suggestive due to potential heterogeneity in behaviors along the earnings distribution.

The overall sample of households and the subsample of households who are likely subject only to an income effect display very similar elasticities. In the full sample, the elasticity of labor force participation

with respect the government income is -0.34; and it is -0.37 in the sample of widows whose earnings were below the test thresholds in the pre-shock years.<sup>6</sup>

## 6. Conclusion

We find that while American households are exposed to considerable income risk from mortality shocks, a significant portion of the potential income loss is insured via several channels. Self-insurance through retirement savings and labor supply account for 60% of the income compensation, where the remaining 40% are attributed to Social Security benefits alone. Exploiting age discontinuity in eligibility for Social Security’s survivors insurance, we find important impacts of the program on the welfare and financial security of American families. The valuation of Social Security in protecting Americans against income losses from mortality shocks comes in the form of significant increases both in net household income and in the consumption of leisure.

## References:

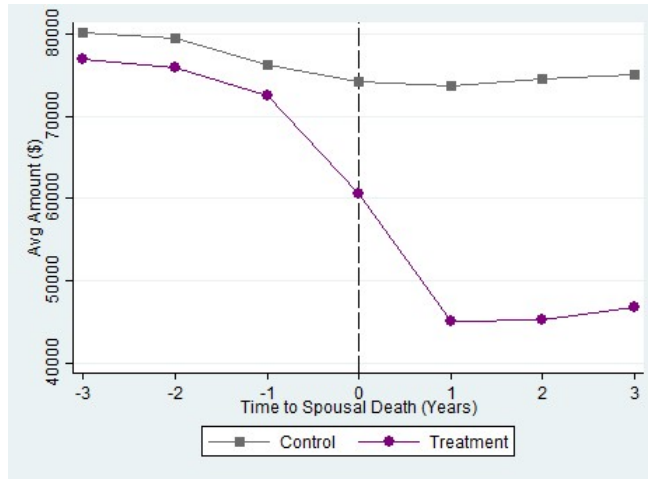
- Browning, M., P.-A. Chiappori, and A. Lewbel (2013). “Estimating Consumption Economies of Scale, Adult Equivalence Scales, and Household Bargaining Power.” *Review of Economic Studies* 80(4): pp. 1267-1303.
- Fadlon, Itzik and Torben Heien Nielsen (Forthcoming). “Household Labor Supply and the Gains from Social Insurance.” *Journal of Public Economics*.
- Nelson, J. A. (1988). “Household Economies of Scale in Consumption: Theory and Evidence.” *Econometrica* 56(6): pp. 1301-1314.
- OECD (2014). Society at a glance 2014. Technical report, OECD Publishing.
- Social Security Administration (2015). Annual statistical supplement, 2014. Technical report, SSA.
- White House (2015). Fiscal year 2016: Historical tables – budget of the US government.

---

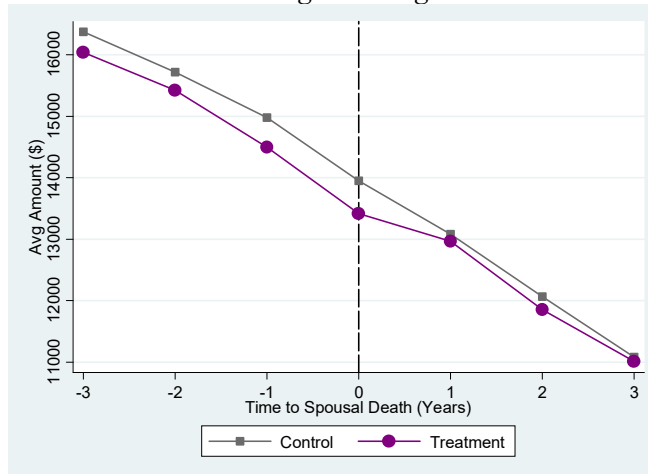
<sup>6</sup> These quantities are calculated as follows:  $\frac{-0.0275/0.68}{5,670/48,000} = -0.34$  and  $\frac{-0.0247/0.35}{8,085/42,500} = -0.37$ .

**Figure 1: The Effects of Spousal Death**

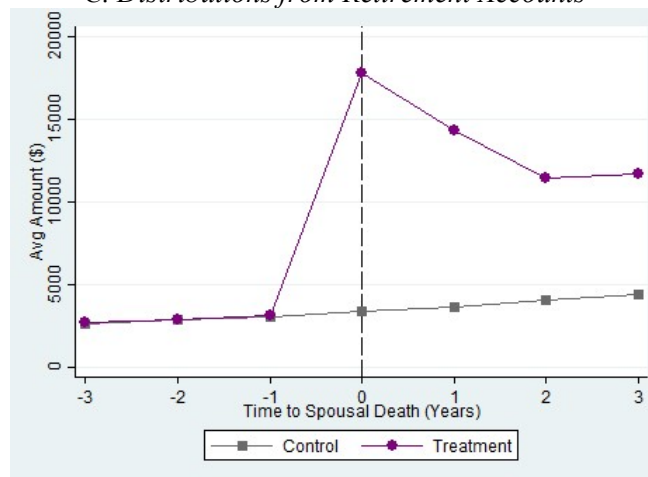
*A. Overall Household Income*



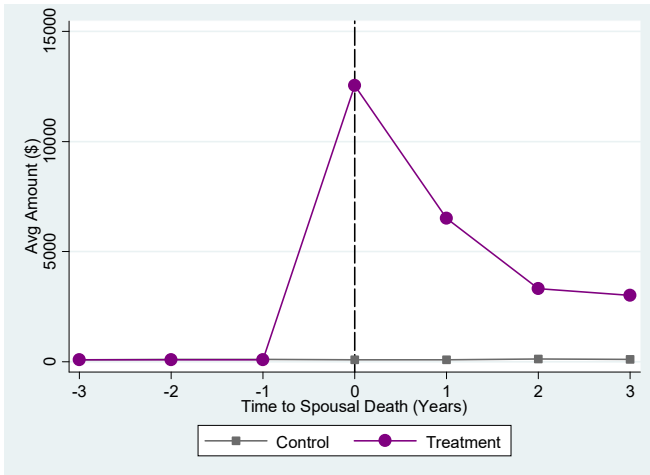
*B. Wage Earnings*



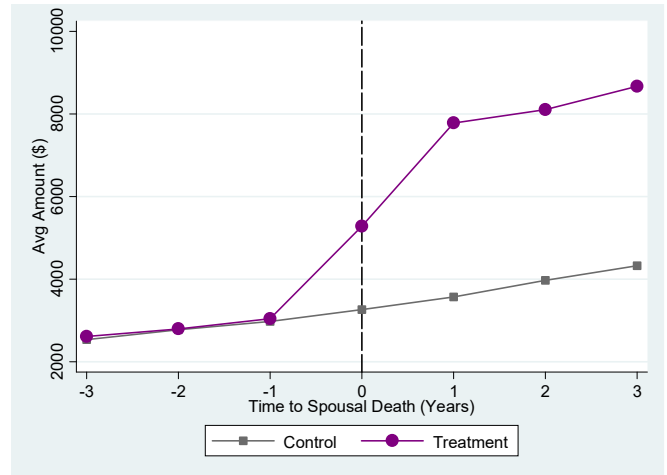
*C. Distributions from Retirement Accounts*



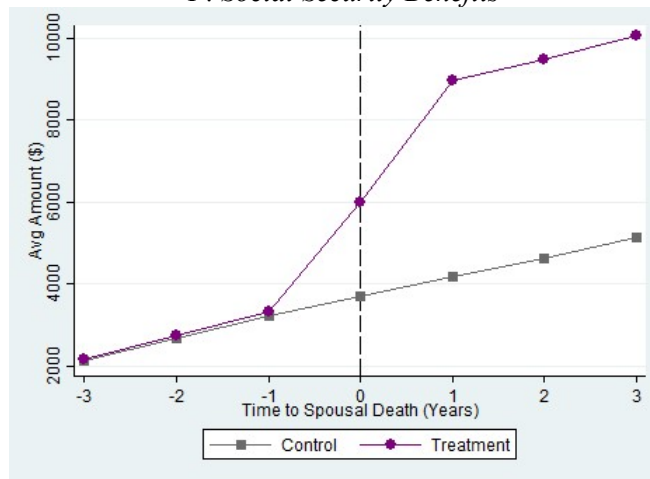
D. Retirement Distributions: Death Code



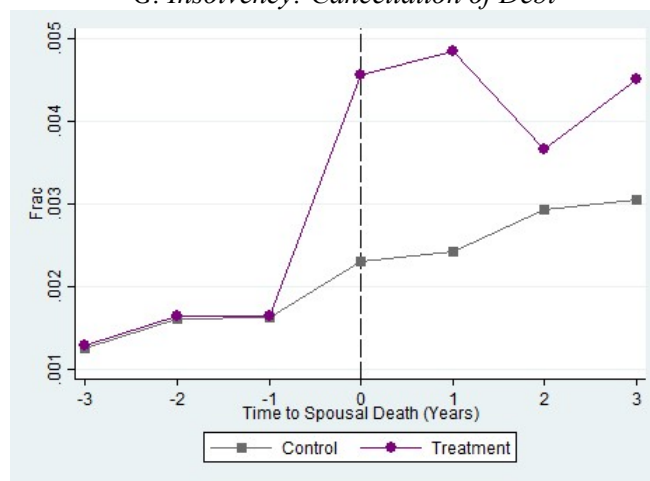
E. Retirement Distributions: Non-Death Codes



F. Social Security Benefits

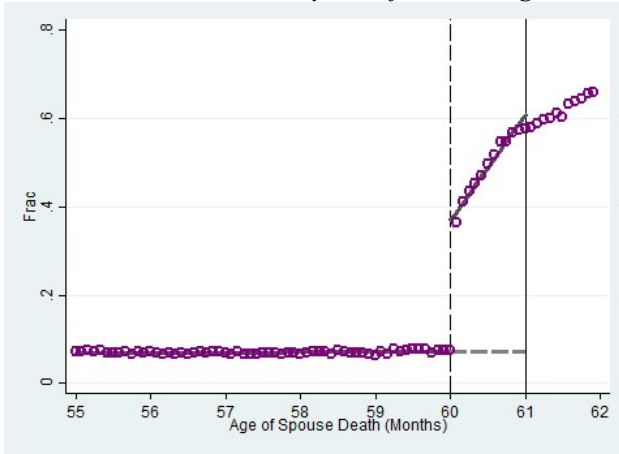


G. Insolvency: Cancellation of Debt

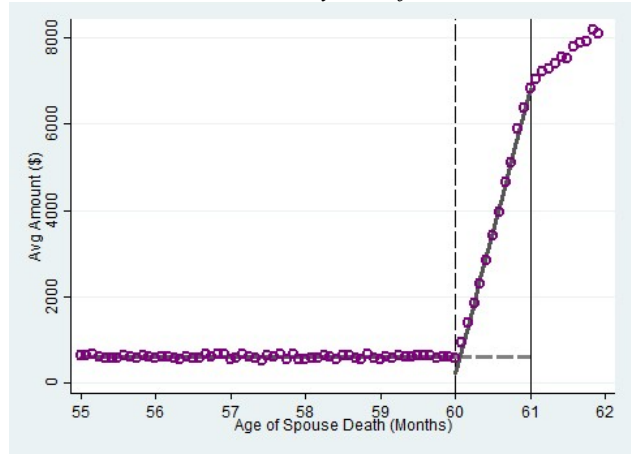


**Figure 2: The Impact of Social Security's Survivors Insurance**

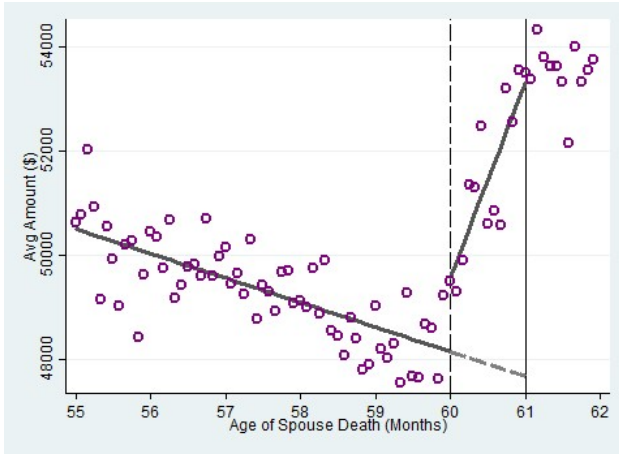
*A. Social Security Benefit Claiming*



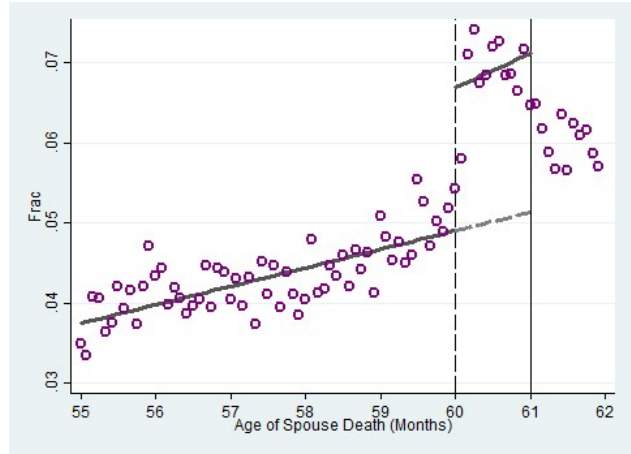
*B. Social Security Benefit Amount*



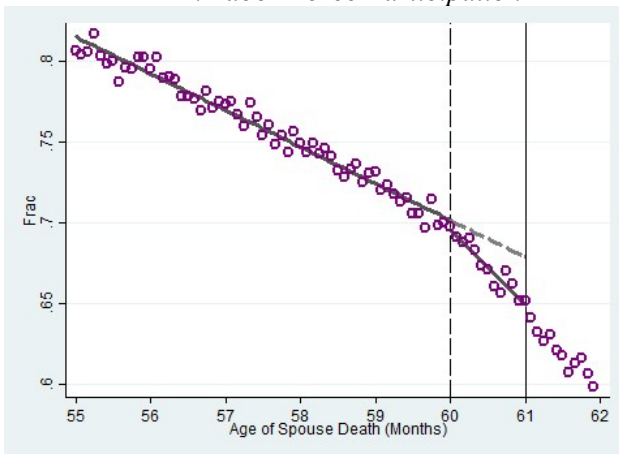
*C. Overall Household Income*



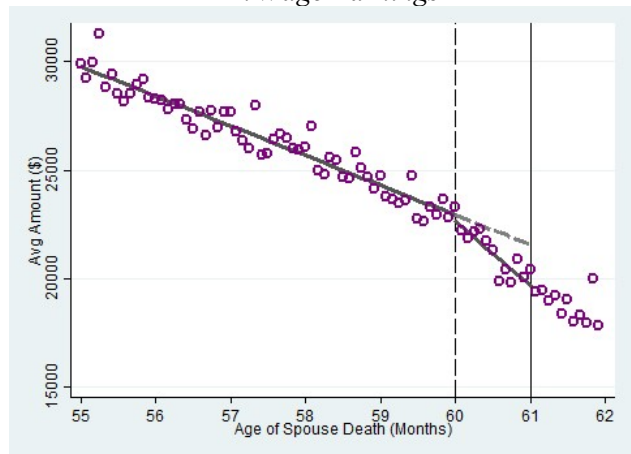
*D. Retirement Hazard*



*E. Labor Force Participation*



*F. Wage Earnings*

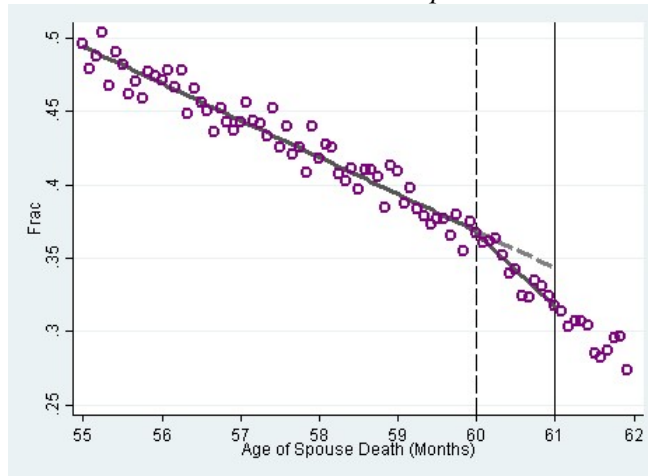




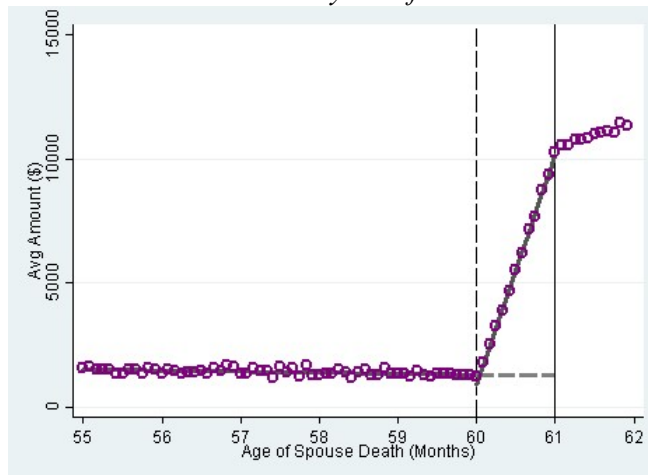


# Appendix Figure 1: The Impact of Social Security's Survivors Insurance among Widows with Labor Income below the Earnings Test

## A. Labor Force Participation



## B. Social Security Benefit Amount



## C. Overall Household Income

