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ABSTRACT

One of the most important economic decisions facing the elderly, and their families, is whether to live independently. A number of previous studies suggest that widows are fairly responsive to Social Security benefits in deciding whether to live independently. But these previous studies have either generally relied on differences in benefits across families or cohorts, which are potentially correlated with other determinants of living arrangements, or have used data from the distant past. We propose a new approach that relies on the large exogenous shifts in benefits generosity for cohorts born in the 1910-1921 period, and we study the impact of this change in living arrangements in the 1980s and 1990s. In this period, benefits rose quickly, due to double-indexing of the benefit formula, and then fell dramatically, as this double-indexing was corrected over a five-year period. Using these legislative changes in benefits, we find that the living arrangements of widows are much more sensitive to Social Security income than implied by previous studies. We also find that the living arrangements of divorcees, the fastest growing group of elderly, are even more sensitive to benefit levels. Overall, our findings suggest that living arrangements are elastically demanded by non-married elderly, privacy is a normal good, and that reductions in Social Security benefits would significantly alter the living arrangements of the elderly. Our estimates imply that a 10% cut in Social Security benefits would lead more than 600,000 independent elderly households to move into shared living arrangements.

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Social Security is the largest and, in the view of many, the most successful social program in the United States. However, it has been well documented that, at the current level of payroll tax finance, the program cannot sustain the current generosity of benefits in the long run. This has ushered in a number of policy proposals for Social Security reform, some of which have advocated a reduction in benefits.[1] A concern with such proposals is that benefit reductions would reverse the gains made by the program over the past 40 years in increasing the well-being of the elderly.

To assess the net effect of benefit reductions on elderly well-being, one must incorporate the extent to which the elderly respond to benefit changes along a number of behavioral dimensions. When faced with a reduction in Social Security income, elderly can stay in the labor force longer, supply more post-retirement hours, reduce consumption, or substitute shared for independent living arrangements. While economists have given great attention to the effect of the program on labor force participation and saving behavior, there has been comparatively little attention on the effect on living arrangements, an important element of elderly well-being.[2]

There is a small existing literature on the sensitivity of elderly living arrangements to elderly incomes. But this literature has produced a wide range of estimated elasticities of the likelihood of living in a shared arrangement with respect to income, from close to zero to –1. This wide range may reflect the inherent difficulties in separating the impacts of income *per se* from the other factors that determine the desire

[1] For example, even the recent Presidential Social Security Commission, which had a mandate not to propose options that reduced benefits for current retirees and near retirees, included options with benefit reductions for future retirees.

[2] See Liebman and Feldstein (2001) for a comprehensive literature review of studies on labor supply and saving behavior. They do not discuss any of the existing studies on living arrangements. Bitler, Gelbach, and Hoynes (2002) examine the effect of welfare reform on living arrangements.

of the elderly to live alone. The several studies in this literature that most carefully have addressed this concern have focused on historical changes in the retirement income available to the elderly, but these changes occurred in a very different social and economic environment than today's, which may have implications for the sensitivity of living arrangements to incomes. Finally, the past literature almost exclusively has been focused on widows. This is understandable given the historically high poverty rate of widows and their prominence in policy debates. However, the share of the elderly that is widowed is falling over time, with particularly rapid growth in elderly divorcees. This suggests that the time is ripe for a broader look at the sensitivity of living situations to incomes for all groups of elderly.

Our paper makes three important contributions to the literature. First, we outline the econometric problems in the previous literature and propose an instrumental variable procedure to circumvent these difficulties. Specifically, we examine the effect on elderly living arrangements of the large exogenous changes in Social Security benefits that affected birth cohorts from 1910 through 1921. The early cohorts in this range saw enormous exogenous increases in their Social Security benefits due to double indexation of the system in the early 1970s. This double indexing was ended in the 1977 Amendments to the Social Security Act that generated the so-called "benefits notch." The 1977 law grandfathered all individuals born before 1917 under the old benefit rules, but those born in 1917-1921 received benefit reductions that were as much as 20 percent lower than observationally equivalent individuals in the 1916 birth cohort. After 1921, benefits were roughly constant in real terms. It is this variation that was first identified by Krueger and Pischke (1992) as a fruitful means of identifying the behavioral effects of

Social Security, in their case in the context of retirement decisions. We follow and improve on their methodology to define an instrumental variable for observed Social Security benefits.

Second, we go beyond the emphasis on widows in the previous literature and present estimates based for all elderly, and separately for those married, never married, divorced, and widowed. Third, we focus in our analysis on the 1980 through 1999 period which is much more recent than other studies and, therefore, provides a better benchmark for thinking prospectively about policy changes.

We do so by using data on the living arrangements of the elderly from the Current Population Survey (CPS) from these years. The large samples in this nationally representative survey allow us to use differences across birth cohorts to carefully identify the impact of legislated benefits changes on living arrangements, and to separately assess the impacts on these different groups of elderly persons.

We find that the likelihood of living with others is very sensitive to incomes for elderly widows and divorcees. For widows, we estimate an elasticity of living with others with respect to Social Security income on the order of -1.3, and for divorcees an elasticity of –1.5. The likelihood of living with others for those who were never married is only modestly related to benefit levels, with an insignificant elasticity of –0.4 to –0.5, and the decision to live with others among those who are married is not sensitive to income levels. Averaging over all elderly, we obtain an elasticity of living with others with respect to benefits of –0.4. These elasticities are much larger than those found in previous studies, which may reflect our improved identification strategy, as well as more fluidity in living arrangements in more recent times. Overall, the findings suggest that

living arrangements are elastically-demanded for non-married elderly, privacy is a normal good, and that reductions in Social Security benefits would significantly alter the living arrangements of the elderly. Our estimates imply that a 10% cut in Social Security benefits would lead more than 600,000 independent elderly households to move into shared living arrangements.

The paper is organized as follows. The next section gives background on the Social Security system and the previous literature. Section II describes the CPS data and the construction of the instrumental variable. Section III discusses the empirical results. There is a brief conclusion.

I. Background

The well-known rise in independent living by the elderly was a striking change in economic behavior in the twentieth century.[3] One factor often hypothesized to explain this trend was the increase in pension income of the elderly, particularly from adoption in 1935 and expansion of Social Security. Probably the most important early study of the effect of Social Security on elderly living arrangements was by Michael, Fuchs, and Scott (1976). They analyzed cross-sectional data from states in 1970 and, as shown in Table 1, estimated that the elasticity of the state proportion of widows living with others with respect to state mean Social Security benefits ranged from -0.45 to -1.05, depending on the set of explanatory variables.[4] In addition, they argued that based on their estimates,

[3] This has been documented extensively in the demography literature, e.g., Kobrin (1976), Kramarow (1995), Macunovich *et al*. (1995), McGarry and Schoeni (2000), Wolf (1995), and Wolf and Soldo (1988), among others.

[4] In the richest specification (which, in addition to Social Security, controlled for average education of widows in the state, fraction nonwhite of all ages in the state, fraction recently mobile in the state, and mean mother/daughter ratio in the state), the estimated elasticity was -0.45.

rising Social Security was the principal reason for the increased incidence of independent living among elderly widows.

As Table 1 documents, estimates from subsequent studies of the income elasticity of the proportion of elderly living in shared arrangements have varied substantially. On the low end, Börsch-Supan, Hajivassiliou, Kotlikoff, and Morris (1992) found that increases in income did not raise the probability that elderly lived in a shared arrangement.[5] But a number of studies have found higher estimates, with Costa (1999) estimating an elasticity of –1 from the state Old Age Assistance (OAA) program in the 1940s, for those states where there was no "relative responsibility" law that required relatives to provide some support for the elderly.[6]

Although Table 1 indicates that previous studies differed along a number of dimensions, including the type of household studied, the estimator, data source, level of aggregation, and the definition of the income variable, an important reason for the differences in estimated elasticities is due to differences in econometric identification. In particular, there are a number of potential econometric pitfalls when estimating the effect of Social Security income on elderly living arrangements. First, for studies that used individual- or household-level data (e.g., Börsch-Supan *et al*. (1992), Schwartz *et al*. (1984), McGarry and Schoeni (2000)), there likely is measurement error in reported Social Security income. This would bias OLS estimated elasticities toward zero. Although Börsch-Supan *et al*. (1992) and Schwartz *et al*. (1984) did not address this, McGarry and Schoeni (2000) substituted mean Social Security survivors income by race

[5] They found that higher income significantly lowered the probability of having chosen an institutional arrangement (i.e., institutions are an inferior good), but that income did not affect the choice to live independently relative to living in a shared arrangement.

and year of birth for reported Social Security income, and estimated reduced-form specifications. Second, for those studies that used measures of income that were broader than Social Security (e.g., Börsch-Supan *et al*. (1992), Schwartz *et al*. (1984), and Macunovich *et al*. (1995)), some components of non-Social Security income may be endogenous. That is, decisions about post-retirement hours of labor supplied and post-retirement decumulation of assets, and, hence, capital income, likely are determined jointly with living arrangement decisions.

Furthermore, estimates from studies that rely on either the reported level of or the cell mean of actual Social Security income (e.g., studies other than Costa (1997, 1999)) may have been confounded by omitted variables correlated with observed Social Security income as well as with living arrangements. For example, Social Security benefits are primarily a function of average lifetime earnings, and higher lifetime earnings, independent of Social Security, should raise the demand for independent living if privacy is a normal good. Therefore, this would tend to bias OLS estimated elasticities away from zero. More subtly, Costa (1997, 1998) has argued that the prospects of increased living independence among the elderly may have made retirement more attractive. But earlier retirement implies a reduced average Social Security benefit level, for a given earnings history, so that there is a direct feedback from independent living to average benefit levels over time.

As noted, the studies of Costa (1997, 1999) do not suffer from these limitations. But these studies are focused on very different time periods, either the early 20th century or the 1940s. The general changes in both the economy and society over the past century

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[6] These laws held children legally responsible for the care of aged parents. The child's financial contribution to care was based usually on the child's income.

suggest that there may be quite different responsiveness to Social Security incomes in living arrangements now than there has been in the past. Increased social mobility, changes in the structure and availability of housing, rapidly rising female labor force participation, and changes in access to both home services and shopping all imply that the elderly make their decisions in a very different environment today than they did fifty or one hundred years ago.

One important change in particular is the changing composition of the elderly, shown in Table 2. In 1960, 19% of elderly men and 53% of elderly women were widowed; fewer than 2% of the elderly were divorced. By 1995, the share of the elderly that is widowed had fallen, with a rapid rise in the share of the elderly that are divorced; the share that is married has also risen somewhat. This suggests that it is important to examine how all groups of elderly, and not just widows, respond to benefits changes in their living arrangements.

II. Data

Sample Selection

This study uses March Current Population Surveys (CPS) from 1980 through 1999. Each file is a cross sectional nationally representative sample of households. To construct our sample, we first assign families within the CPS. A family is defined as the household head, his or her spouse, and any children of the household head that are living in the household and are under the age of 19. We assume any other member of the household is his/her own family for the purpose of our definition. These families serve as our observational unit. Note that there may be more than one "family" in a given CPS "household" (e.g. if there are multiple non-married elderly living together).

To assign Social Security benefits to families, it is necessary to assign a "Social Security beneficiary." Our default is to assign this person to be the oldest male of the family who is over 65. If there is no male over age 65, the Social Security beneficiary is assigned to be the oldest never-married female in the family. These two groups consist of people who are likely to have had Social Security benefits based on their own earnings history, rather than that of their spouse.

If there is neither a male nor a never-married female over 65, we assign the Social Security beneficiary to be the divorced or widowed female that is over age 62. We assume that her Social Security benefits are based on the earnings of her former or deceased spouse. We further assume that the former or deceased spouse was three years older than her, so that the "age of the Social Security beneficiary" is this woman's age plus three for the purposes of calculating our instrument (discussed below).

These restrictions lead to a sample consisting of any families that contain at least one male or never-married female over the age of 65, or that contain a widowed or divorced female over the age of 62. We select this age group because most people who are eligible to collect Social Security benefits begin doing so by age 65. The overall sample is based on 230,045 family-year observations. Because the instrument varies only by year of birth, we aggregate these data into age-by-year-of-birth cells, producing either 473 or 494 cells depending on whether widows and divorcees are included in the analysis. The average cell size was 466 families. We include both sexes in our data set. For widows, 84% of the observations are female, so our results are very comparable to the previous literature; indeed, if we estimate models for females only, we obtain estimates almost identical to those presented below.

Finally, we create a variable to describe whether each family is living independently or with others. We consider a married couple living together to be living independently. Otherwise, any elderly person who is living with others in their household is not considered to be living independently.[7] Table 3 shows sample means for selected variables, with standard deviations in parentheses. The mean proportion living independently ranges from about 0.59 for never married individuals to 0.84 for married couples, and is 0.74 pooled over all families.

Construction of the Instrument

As highlighted earlier, the fundamental problem with earlier studies of the impact of Social Security on living arrangements is that benefit levels are correlated with factors that might otherwise influence living arrangements. Partly this reflects differences across individuals, which is abstracted away in our cell-level analyses. But there are also important average differences across cohorts, such as differences in average lifetime earnings or tastes for independent living (which feedback to retirement decisions, and therefore to Social Security benefit levels), which are correlated with living arrangements as well.

Our goal in this paper is therefore to construct an instrument for Social Security benefits that is independent of other factors that differ across year-of-birth cells; that is, an instrument which is identified solely by legislative changes in benefits and not from differences in birth cohort characteristics. We do so by exploiting the exogenous large changes in Social Security benefits documented in the introduction: the enormous run up

[7] We attempted to further decompose our data into those living with their own children versus those living with others. But, unfortunately, changes in the construction of the CPS family relationship variables

in benefits for birth cohorts from 1910 through 1916, followed by the striking decline for those birth cohorts from 1917 through 1921. Over this relatively short period, otherwise similar workers saw enormous swings in their level of Social Security entitlement, allowing us to potentially identify the effects of Social Security independently from individual or cohort characteristics.

Our strategy for doing so is to create a measure of Social Security benefits entitlement that is identical for each birth cohort *except for changes in the benefits law*. To create such an instrument, we first assigned an earnings history to the 1916 birth cohort. The *Annual Statistical Supplement* produced by the Social Security Administration each year contains the median Social Security earnings by gender for five-year age groups on a yearly basis for the current year as well as years past. We use median male earnings from these tables. We assigned median earnings at age 22 (from the median earnings for ages 20-24 in 1938), age 27 (from median earnings for ages 25-29 in 1943), etc., in five-year intervals. We then assume a linear trend in earnings in between these five-year intervals. This method is used through age 60, and earnings are assumed to grow with inflation for ages 60-65. We do not use median earnings for workers over 60 because many of these workers have entered "bridge" jobs, so that the median worker's earnings at these ages may not be representative of workers who have remained in their lifetime jobs through age 65. This generates an earnings history for a median male earner in the cohort born in 1916. We use the same earnings profile even when assigning benefits to never married females, because we assume that their earnings profile would more closely resemble that of a male worker than that of the median female worker.

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halfway through our sample left us unable to draw any conclusions as to relative shifts across these groups.

Importantly, we want our instrument to vary only with changes in Social Security benefit rules and do not want to capture changes in earnings profiles due to human capital and productivity changes in cohorts over time. Therefore, we use the earnings history that we constructed for the 1916 cohort for *all* birth cohorts, and simply use the CPI to adjust this earnings profile for inflation for earlier and later cohorts. Thus, all birth cohorts have the same real earnings trajectory over time. By holding lifetime earnings constant by construction, this insures that all of the variation in the instrument comes from variation in the benefit formula due to the law change. We also assume that this prototypical earnings history ends at age 65, so that we do not incorporate any variation across cohorts in average retirement ages (which might be correlated with tastes for independent living).

Our next step is to input the constructed earnings histories into the Social Security Administration's ANYPIA program. This program calculates the monthly benefit at retirement given a date of birth, date of retirement, and earnings history. ANYPIA gives the monthly benefit at the date of retirement (the primary insurance amount, or PIA). We assign birthdays of June 2 in the particular year of birth and assume that people retire and claim benefits in June of the year that they turn sixty-five[8].

The Social Security Administration periodically increases nominal benefits to adjust for inflation. To obtain a value for the predicted benefit for a given age and year-of-birth cohort, we need to account for all "cost of living adjustments" (COLA) until the date of interview. We calculate the median month in which a given age and year-of-birth

[8] We assume that they claim in June because some cost-of-living (COLA) adjustments were administered in June of a given year, rather than December of a given year. We assume that the beneficiary claims in June so that he will receive any COLA in that year. This prevents variation across years of birth based simply on the timing of the COLA.

cell was interviewed, and administer all COLA adjustments from the time that the person would have retired through this date. This produces a predicted (COLA-adjusted) Social Security monthly benefit for each age and year-of-birth cell. We then multiply by 12 to get the predicted annual benefit.

Figure 1 shows the plot of cell mean annual Social Security income versus the instrument by year of birth.[9] The variation in benefits, even conditional on constant earnings histories, is readily apparent in the graph of the instrument. Benefit are rising steadily until 1910, and then ramp up quickly from 1910 through 1916, before falling precipitously in the 1917-1921 period, and then rising more slowly thereafter. The graph of actual Social Security incomes by cohort tracks this pattern fairly well, with the benefits notch apparent in the data. So there is a good first stage relationship here: our legislative variation instrument clearly predicts actual Social Security incomes.

The relationship between this instrument and the share of elderly living with others is shown in Figure 2. There is a negative correspondence between these two series: when legislative generosity rises in the early part of the sample, the share living with others falls, then both reverse at a similar time, and flatten out in the later years. The correlation between these series is –0.18.

Regression Specification

To examine the effect of Social Security on living arrangements, we estimate the following basic specification,

[9] Although our data run through year of birth of 1934, we censor these figures at 1930 because small sample sizes in the last few years lead to highly variable patterns in the data. The regressions are weighted by cell size to appropriately reflect the noise in these data.

$$P_{ij} = \beta' X_{ij} + \theta SSIncome_{ij} + \sum_{j=65}^{90} \gamma_j D_{ij}^{Age\ j} + \sum_{t=1980}^{1998} \alpha_t D_{ij}^{Year\ t} + \sum_{r=1}^{8} \phi_r D_{ij}^{Region\ r} + u_{ij}, \qquad (1)$$

where i and j index year of birth and age, respectively. P is the proportion of families in a shared living arrangement, *SSIncome* is the cell mean reported annual Social Security income, and u is a disturbance term. X is a vector of demographic variables that includes controls for cell means of educational attainment of the head (high school diploma, some college, and college degree), age of the spouse (if present), marital status (married, widowed, and divorced in the pooled sample) white, and female. By controlling for these cell characteristics, we control for any other trends in cohort characteristics that might be correlated with both the legislative changes in benefits determination and with living arrangements. The parameter θ indicates the change in the proportion of elderly in shared living arrangements for a change in Social Security income. Following Krueger and Pischke (1992), we also include a full set of dummies for the age of the head, $D^{Age\ j}$, calendar year dummies, $D^{Year\ t}$, and Census region of residence dummies, $D^{Region\ r}$.[10] The age dummies control for differences across age groups in their propensity to live alone; the year dummies control for any general time trends in living arrangements. Thus, after controlling for age and calendar year, the variation in *SSIncome* is based only upon year of birth. When we then instrument with the variable described above, our model is identified solely by legislative variation in benefits generosity across birth cohorts, and not any differences in their earnings history.

[10] The excluded group consists of families with heads' age over 90, observed in calendar year 1999, residing in the ninth (Pacific) Census region.

The means of the dependent variable and primary explanatory variable are shown in Table 3 for each sample.[11]

III. Results

Panel A of Table 4 gives the grouped ordinary least squares (OLS) estimate of θ for samples based on marital status, where the weights were based on the cell sizes. Standard errors are shown in parentheses. All coefficients are multiplied by 1000 for ease of interpretation; so the coefficient shows the impact of a real $1000 rise in Social Security benefits on living arrangements. Based on the standard deviations of Social Security income by marital status in Table 3, a $1000 increase in benefits represents between a 0.8 (for married) and 1.5 (for never married) standard deviation change in income.

For the pooled sample in column (1), the OLS estimate is –0.0085, and it is marginally statistically significant. This says that for each $1000 of Social Security income, the likelihood that the typical elderly person lives with others falls by 0.9 percentage points. Thus, across all elderly, privacy is clearly a normal good. The implied elasticity of living with others with respect to Social Security income is –0.17. This is at the lower end of the previous literature, but that is not really a sensible comparison as we are pooling all elderly and not examining singles only.

Unfortunately, the OLS estimates might be biased and inconsistent due to measurement error and omitted variables, as outlined in section II. Panel B of Table 4 shows the grouped instrumental variable (IV) estimates. For the pooled sample, the

[11] Descriptive statistics for all variables and samples are available in an appendix from the authors.

coefficient rises to –0.02, and the elasticity more than doubles to –0.41. This is a sizeable effect for the entire pool of elderly.

The pooled sample combines households of different marital types, some of which might be expected to display quite different responsiveness of Social Security to living arrangements. For example, because most married households live independently and have many potential sources of income with which to support themselves, they may be expected to have relatively low sensitivity of living arrangements to Social Security *a priori*. On the other hand, widowed individuals may be heavily reliant on Social Security as an income source, and, therefore, be expected to have a much more elastic response. Thus, columns (2)-(5) in Table 4 show estimation results for four different sub-samples, split out by marital status.

The first subsample is the sample of most interest from the previous literature, widows. Our OLS estimate for this population is that each $1000 in benefits leads to 3.65 percentage points fewer widows living in a shared arrangement. The implied elasticity is –0.55, which is in the center of the previous literature. When we instrument, however, the effect more than doubles, so that each $1000 in Social Security income leads to 8.62 percentage points fewer widows living in a shared arrangement, for an implied elasticity of living with others of –1.3. This is well above even the largest estimates from the previous literature, and suggests that identification problems or different timing have biased downward estimates of the responsiveness of widows to income in their residential decisions.

As noted earlier, the fastest growing group of elderly is divorcees. We examine their sensitivity to Social Security benefit levels in the third column of Table 4. In fact,

we find that they are roughly as income sensitive as widows, with an instrumental variable elasticity of -1.48. This estimated elasticity is significantly larger than those of Costa (1999), who examined a pooled sample of all non-married women using Old Age Assistance payments in the 1940s.

The IV estimates for the sub-sample of married households in column (4) indicate that the effect of additional Social Security income on the proportion in shared arrangements is small and not statistically different than zero. The response of married households is essentially inelastic.

The final column examines the impact on never-married individuals. Here there is a sizeable negative effect, but it is not statistically significant. It implies that each $1000 of Social Security income lowers the likelihood of living with others by 4.85 percentage points, for an implied elasticity of -0.44. These elasticities are similar to the IV estimates in Costa (1999). In addition, Costa (1999) found a similar pattern in which the IV estimates exceed the OLS estimates.

Table 4 also shows estimates for a selected group of demographic variables from the IV specifications.[12] For the pooled sample in column (1), married and white households are significantly less likely to live in shared arrangements. When the sample is split out by marital status in columns (2)-(5), there does not appear to be a consistent relationship between the demographic variables and the incidence of shared arrangements.[13]

[12] The complete set of parameter estimates for all variables in all samples is available in an appendix from the authors.

[13] We adopted the convention that the male is the "head" of household in married couples, so that the female variable is omitted from the specification in column (4) for the sample of married households.

Thus, to summarize our basic results, the living standards of the elderly appear fairly elastic with respect to Social Security benefit levels, particularly when appropriately instrumented. The overall responsiveness is driven by highly responsive behavior among widows and divorcees, with moderately responsive behavior among those never married, while there is no responsiveness for married couples. This suggests that Social Security policy can have an important effect on the living arrangements of the elderly.

To give some sense of the implied policy effects from our estimates, Table 5 shows the impact of a 10% cut in benefits on living arrangements in 1999, the last year in our sample. The first column shows the number of households 65 and older who currently live with others by marital status. In 1999, over 5.5 million elderly households lived in shared arrangements, and almost two-thirds of these households (about 3.8 million) were either divorced or widowed individuals. The second column shows the mean annual Social Security benefit in each group. The third column shows the additional number of elderly that would live in shared arrangements if benefits were cut by 10%. The results are striking. In total, more than 600,000 elderly households would move into a shared arrangement if benefits were cut, and more that 430,000 widows would do so. Overall, almost all the elderly affected would be either widowed or divorced individuals. This is because those groups comprise the great majority of elderly (as shown in column (1)) and these groups had the most elastic response of living arrangements to Social Security (in panel B of Table 4).

III. Conclusion

As the largest social insurance program in our country, and the major single source of income for the elderly, Social Security will continue to be at the center of debates over the size of the government sector in the U.S. These debates have been, and continue to be, influenced by the large literature on the impacts of Social Security on labor supply and savings, literatures that are reviewed in detail in Feldstein and Liebman (2001). But these are only two of the possible effects of reforms to Social Security. Another important margin of response is living arrangements. If privacy is a normal good, the elderly may choose to live more independently as benefits rise. Likewise, they may be forced to live with their children and with others more often if benefits are cut.

Our paper makes three important contributions. First, we have relied on a more plausibly exogenous change in benefits than used in previous studies, the extreme run-up and then sharp reduction in benefits generosity for the cohorts born in the 1910-1921 period. Second, we have examined the impacts of benefits on the living arrangements of all elderly groups, including, in particular, elderly divorcees, the fastest growing group of elderly. Finally, we have used up-to-date data from the 1980s and 1990s to reflect that fact that benefits sensitivity may be changing relative to earlier in the 20th century, the period studied in the best earlier papers.

Our findings confirm the conclusions of the previous literature that widows are sensitive to benefits in their living arrangements, but our implied elasticities are in fact much larger than those found by earlier studies, with each 1% rise in benefits found to lead to a 1.3% reduction in the share of widows living with others. We also find the elderly divorcees are even more income elastic in their living arrangements. But those who are never married are less elastic, and those are married are not at all elastic.

Overall, averaging across all of these groups, there is a sizeable elasticity of –0.4. This implies that reducing Social Security benefits by 10% would lead over 600,000 more independent elderly households to live with others.

These findings raise important questions about the welfare implications of shifting living arrangements. The fact that living arrangements are so income sensitive, particularly for widows and divorcees, implies that privacy is a valued good. If there is rational, forward-looking decision making by the elderly and their families/others that share their households, *and* if utility is jointly maximized over the household unit, then this implies that welfare is reduced (along this dimension) when benefits are cut and the elderly are forced to live with others.

However, these assumptions may not hold in reality. For example, the elderly may crave independence in the short run, but underestimate the long run costs of living alone, either due to information failures, or to time inconsistency in discounting the future.[14] There have been numerous studies in the demography, medical, and gerontology literatures that suggest there are significant costs and risks to living alone for the elderly. One pathway is through physical and health risks. For example, Gurley *et al*. (1996), Tromp *et al*. (1998), and Cwikel *et al*. (1989) all document a strong relationship between living alone and the risk of falling, with Gurley *et al*. (1996) and Reuben *et al*. (1992) further linking living alone to incapacitation and death. A second pathway is through attenuated social interaction. Studies by Berkman and Leonard (1979), Blazer (1982), Zuckerman, Kasl, and Ostfeld (1984), and reviewed in House, Landis, and

[14] See Diamond and Koszegi (1998) for an application of time inconsistency to retirement decisions among the elderly. The same set of principles, where individuals are more patient in the future then they are today, suggest that the elderly might choose to live alone today even if they would regret this decision in the long run.

Umberson (1988), link social interaction with better health and lower mortality.[15] Whether the elderly fully anticipate these costs and risks and rationally trade them off for the benefits of independence is unclear.

Even if the elderly make their decisions rationally, if it is the others in the household who control the decision on living arrangements, and if they are not jointly maximizing the well-being of the elderly and themselves, then there may also be sub-optimal allocation of living arrangements. For example, if children want to "get rid" of their parents, so long as the parents have some minimum level of income on which to live independently, then rising benefits could lead to more independence but lower welfare. Thus, the welfare implications of these findings are unclear. Exploring these dimensions is well beyond the scope of this paper, but clearly worthy of future research.

[15] Because of unobserved factors, healthier people may also be more social, so that ascribing a causal link to these findings may be tenuous. For example, Clarke, Clarke, and Jagger (1992) analyzed a randomized experiment on the elderly in which social workers offered the treatment group support packages designed to encourage social contact. They found no significant differences in mortality, physical status, demand for medical and social services, and subjective assessments between the treatment and control groups. The only significant difference was that the treatment group had better self-reported health status.

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Table 1: Summary of Results from Selected Previous Studies

Study	Data Source	Sample Size and Unit of Observation	Group	Income Variable	Estimator	Income Elasticity of Living in a Shared Arrangement, (range in parentheses)
Michael *et al.* (1976)	1970 cross-section	50 states (means)	Widows, 65 and older	State mean Social Security payments to survivors	Grouped OLS	(-0.45,-1.05)
Schwartz *et al.* (1984)	1971, 1977 waves of Retirement History Survey	2,606 non-married, 3,911 married, 985 newly widowed obs.	Non-married, married, newly widowed; 60-65 in 1971	Log of total income	Logit	-0.11, non-married; 0.03, married; -0.24, newly widowed
Börsch-Supan *et al*. (1992)	1982, 1984-87 Hebrew Rehabilitation Center for the Aged Survey of the Elderly	314 people, 60 and older		Total income	Multi-period, multi-nomial probit	No effect
Macunovich *et al*. (1995)	1965, 1970, 1975, 1980, 1985, 1990 CPS	30 five-year-age-group-by calendar-year obs.	Widows, 65 and older	Log of cell median non-labor income	Grouped logit	-0.90
Costa (1997)	1910 Census IPUMS[a]	361 people	Men, 60-87	Civil War pension income	Probit	-0.77
Costa (1999)	1940-50 Census IPUMS[a]	96 state-mean-by-calendar-year obs.	Non-married women, 65 and older	State-year cell mean Old Age Assistance income	Grouped OLS, Fixed (FE), Random Effect (RE), IV	OLS, FE, RE: (-0.17,-0.23) no law[b], (-0.02, 0.03) law IV: (-0.38,-1.00) no law, (-0.21, -0.42) law
McGarry and Schoeni (2000)	1940-90 Census IPUMS[a]	Pooled, 251,423 people	Widows, 65 and older	Mean Social Security survivors income by race and year of birth	Multi-nomial logit	(-0.29,-0.54)[c]

Notes: The last column shows the elasticity of living in a shared arrangement with respect to that study's measure of income. When a study produced a range of elasticities, that range given in parentheses in the last column.

a. IPUMS stands for the U.S. Census Integrated Public Use Microdata Series developed by Ruggles and Sobek (1997).

b. The term law here refers to the whether the state had a "relative responsibility" law in place, which held children legally responsible for the care of aged parents. Costa found that living arrangements were less responsive to Old Age Assistance income in states with such laws.

c. The income elasticity of living in a shared arrangement of -0.54 was calculated using the 1940-90 pooled sample estimates in McGarry and Schoeni (2000) evaluated at the 1940-90 pooled sample means, whereas the elasticity of –0.29 was calculated using the 1980-90 sample parameter estimates.

Table 2. Percent Distribution of Marital Status for Households 65 and Older, by Sex, for Selected Years 1960-1995

	(1)	(2)	(3)	(4)
	Marital Status			
Year	Married	Never Married	Widowed	Divorced
A. Women				
1960	36.8	8.5	53.1	1.5
1965	36.0	7.7	54.4	1.9
1970	35.6	7.7	54.4	2.3
1975	39.1	5.8	52.5	2.6
1980	39.5	5.9	51.2	3.4
1985	39.9	5.1	50.7	4.3
1990	41.4	4.9	48.6	5.1
1995	42.5	4.2	47.3	6.0
B. Men				
1960	71.7	7.3	19.4	1.7
1965	71.3	6.6	19.5	2.6
1970	73.1	7.5	17.1	2.3
1975	79.3	4.7	13.6	2.5
1980	78.0	4.9	13.5	3.6
1985	77.2	5.3	13.8	3.7
1990	76.5	4.2	14.2	5.0
1995	77.0	4.2	13.5	5.2

Note: These figures were taken from Table 40 of the 2000 *Statistical Abstract of the United States*, Table 42 of the 1990 *Statistical Abstract of the United States*, and Table 39 of the 1980 *Statistical Abstract of the United States*.

Table 3. Sample Means for Selected Variables, with Standard Deviations in Parentheses

	(1)	(2)	(3)	(4)	(5)
	Sample				
Variable	Married	Never Married	Widowed	Divorced	Pooled
Proportion Living Independently	0.836 (0.063)	0.586 (0.118)	0.710 (0.047)	0.698 (0.114)	0.735 (0.042)
Proportion in Shared Arrangement	0.164 (0.063)	0.414 (0.118)	0.290 (0.047)	0.302 (0.114)	0.265 (0.042)
Social Security Income	7838 (1217)	3766 (654)	4402 (691)	3988 (941)	5323 (704)
Number of Observations	473	473	494	494	494

Note: The table shows means calculated from the 494 age-by-year-of-birth cells based on the underlying sample of 230,045 family-year observations from the 1980-99 March CPS, as described in the text. Standard deviations are in parentheses. Social Security income is expressed in 1982-84 dollars.

Table 4. Parameter Estimates of the Effect of Social Security on the Proportion in a Shared Living Arrangement, Elasticity in Brackets

	(1)	(2)	(3)	(4)	(5)
			Sample		
Explanatory Variable	Pooled	Widowed	Divorced	Married	Never Married
A. OLS Estimates					
Social Security Income	-0.0085 (0.0051) {-0.17}	-0.0365 (0.0078) {-0.55}	-0.0287 (0.0091) {-0.38}	0.0006 (0.0036) {0.03}	-0.0222 (0.0095) {-0.20}
B. Instrumental Variable Estimates					
Social Security Income	-0.0202 (0.0088) {-0.41}	-0.0862 (0.0187) {-1.31}	-0.1123 (0.0531) {-1.48}	-0.0037 (0.0062) {-0.18}	-0.0485 (0.0373) {-0.44}
Head is White	-0.138 (0.074)	-0.039 (0.078)	0.020 (0.072)	-0.175 (0.064)	-0.139 (0.091)
Head has High School Diploma	-0.047 (0.041)	-0.015 (0.054)	0.143 (0.061)	-0.041 (0.044)	-0.060 (0.071)
Head has Some College	-0.069 (0.058)	0.002 (0.067)	0.014 (0.083)	-0.069 (0.054)	-0.028 (0.100)
Head has College Degree	0.039 (0.067)	0.157 (0.067)	-0.002 (0.073)	-0.079 (0.063)	-0.157 (0.077)
Head is Female	0.036 (0.051)	-0.042 (0.040)	-0.073 (0.079)	---	0.010 (0.058)
Head is Married	-0.266 (0.099)	---	---	---	---
Head is Widowed	-0.122 (0.075)	---	---	---	---
Head is Divorced	-0.055 (0.096)	---	---	---	---
Number of Observations	494	494	494	473	473

Note: The dependent variable is the proportion of households in the cell in a shared living arrangement. The table shows the parameter estimate of the effect of Social Security income on the proportion in a shared living arrangement. Standard errors are in parentheses. Income is measured in thousands of 1982-84 dollars. The specifications also include controls for dummy variables for single years of age from 65 to 90 for the head, calendar years 1980-98, eight Census regions, and dummy variables for the age and educational attainment of the spouse (if present). The elasticity of the proportion in shared living arrangements with respect to Social Security income is shown in curly brackets. It was calculated based on the parameter estimate shown in the table and the sample means of the dependent variable and Social Security income shown in Table 3.

Table 5. Estimated Effect of a 10% Social Security Benefit Cut on the Number of Households 65 and Older in Shared Living Arrangements in 1999

	(1)	(2)	(3)
Marital Status	Number of Households in Shared Arrangements	Mean Social Security Benefit	Additional Households in Shared Arrangement Due to 10% Benefit Cut
Married	1,324,008	$8,843	30,084
Never Married	416,304	$4,242	25,491
Divorced	743,562	$4,302	118,556
Widowed	3,042,040	$4,885	434,225
Total	5,525,914	---	608,356

Note: Authors' calculations using the sample mean proportion in shared arrangements, Social Security income, and cell sizes in the four samples (married, never married, divorced, and widowed) in 1999, the instrumental variable parameter estimates for Social Security income in columns (2)-(5) from panel B of Table 4, and the CPS population weights for 1999.

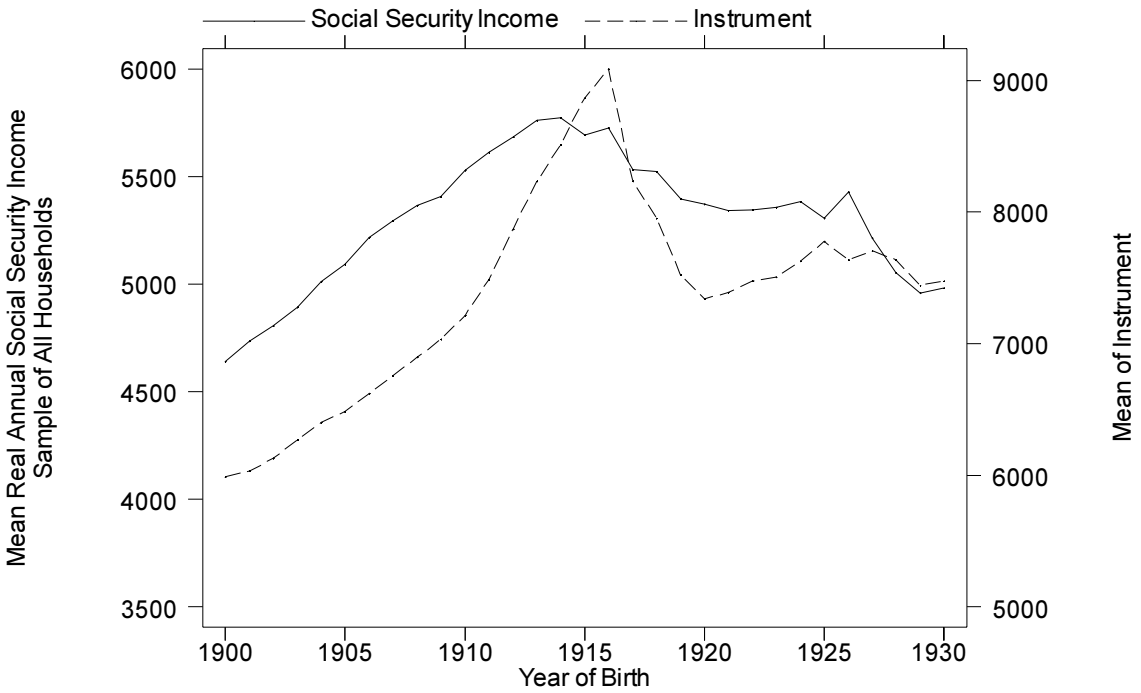

Figure 1. Social Security Income and Instrument by Year of Birth

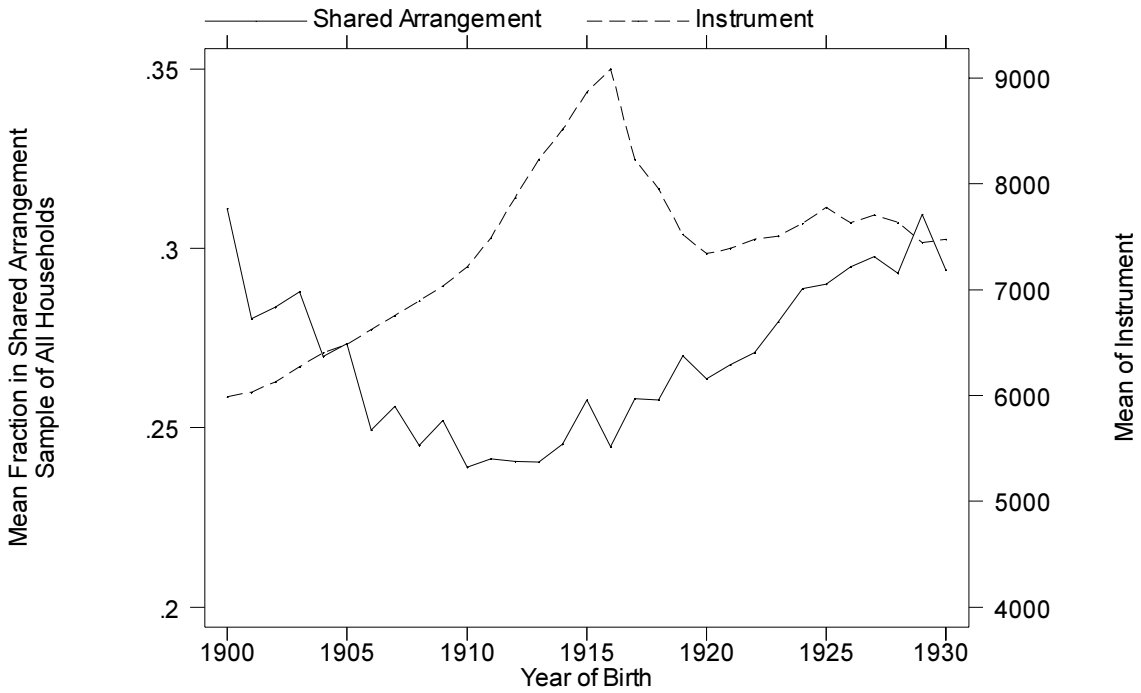

Figure 2. Fraction Shared Arrangement and Instrument by Year of Birth