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Social Security and elderly labor supply: Evidence from the Health and Retirement Study ☆

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ABSTRACT

This study uses panel data from the Health and Retirement Study (HRS) to estimate the effects of Social Security income on elderly labor supply in the 1990s and early 2000s. The identification strategy takes advantage of the 1977 amendments to the Social Security Act, which led to a large, unanticipated reduction in Social Security benefits for those born after January 1, 1917. Despite the advanced age of the notch cohorts, there is a significant, negative and surprisingly elastic relationship between Social Security income and hours of work. This suggests that currently proposed reductions in benefits would induce Social Security recipients to work more hours in retirement, even through their 70s and early 80s.

1. Introduction

The Social Security system of old age, survivorship and disability benefits is the largest and best-known social insurance program in the United States. Unfortunately, it is also well-known that the Social Security system is fiscally unsustainable at current levels of benefits and payroll taxes. Because of this, numerous proposals have been made to reform it in some way, most of which involve reducing benefits in one form or another (e.g., Moynihan and Parsons, 2001; Diamond and Orszag, 2005).

An important factor to understand when assessing the welfare effects of these proposals is the elasticity of elderly labor supply. If older workers can offset lost Social Security income with labor earnings, either by delaying retirement or working part-time in retirement, they will be less negatively affected by reductions in benefits than otherwise. Models of the joint retirement and post-retirement hours of work decision predict this response (Burtless and Moffitt, 1985), and there may even be health benefits from doing so (Snyder and Evans, 2006). On the other hand, continuing an attachment to the labor force at later ages may be difficult, particularly for the less-educated or those in more physically intensive jobs.

This paper contributes to an understanding of these welfare effects with estimates of how workers beyond traditional retirement ages respond to legislated changes in Social Security benefits. At present, very little is known about the labor supply behavior of this segment of the population. Nevertheless, the matter is of critical public interest: since the typical retirement extends well past the range of traditional retirement ages, any assessment of the welfare effects of a possible across-the-board benefit cut must necessarily take this information into account. From an academic perspective, the results are also important because elderly labor supply has generally been thought of as fairly inelastic to changes in Social Security benefits (Krueger and Pischke, 1992). However, this does not appear to be the case any longer.

A priori, there are a number of reasons to believe that the relationship between Social Security income and elderly labor supply has changed since the 1970s and 1980s, the years studied by much of the earlier literature (Hurd and Boskin, 1984; Burtless, 1986; Krueger and Pischke, 1992; Snyder and Evans, 2006). On a policy level, the enactment of laws against age discrimination and the abolition of mandatory retirement have also encouraged the employment of older workers (Neumark and Stock, 1999). Moreover, the implicit tax imposed by the Social Security earnings test, which discourages recipients of retirement benefits from earning labor income, was progressively reduced and ultimately eliminated for beneficiaries at or above the normal retirement age (Gruber and Orszag, 2003; Benitez-Silva and Heiland, 2007; Haider and Loughran, 2008; Engelhardt and Kumar, 2009). Finally, a critical

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background element of Krueger and Pischke's (1992) analysis – the fact that elderly labor supply had been declining, notwithstanding legislatively imposed reductions in Social Security wealth – is simply no longer the case. This trend reversed itself in the early 1990s, and elderly workers are now a rapidly growing segment of the labor force (Gendell, 2008).

This paper examines the link between Social Security income and elderly labor supply with detailed Health and Retirement Study data and a well-established instrumental variables strategy based on the structure of the Social Security benefits formula. The intuition behind the estimation strategy is to exploit the fact that Social Security benefits are determined by different sets of rules depending on beneficiaries' years of birth. Because of this, individuals who are otherwise identical – i.e., individuals with the same real earnings profile, but born in different years – will receive different amounts of benefits. Numerous recent studies have taken advantage of this aspect of the Social Security rules to quantify the effects of retirement income on various economic outcomes (e.g., Engelhardt et al., 2005; Engelhardt and Gruber, 2006; Moran and Simon, 2006; Snyder and Evans, 2006; Engelhardt, 2008; Gustman and Steinmeier, 2008). The estimation strategy is conservative on purpose: since the "natural experiment" involved is very well known, the empirical results can be interpreted and accepted by the widest possible audience of economists.

The empirical results show that the relationship between Social Security income and elderly labor supply is strongly negative, and much more elastic than one would expect given the advanced age of workers in the sample (who are, on average, 79).[1] For instance, a $1000 increase in Social Security income (in 2009 dollars) reduces beneficiaries' labor force participation by 0.9 percentage points (to put this number in perspective, the overall labor force participation rate for this group is 12.3%). Among married couples, wives' labor supply is more responsive to changes in Social Security income than husbands' labor supply. In addition, the labor supply of less-educated workers is more sensitive to variation in Social Security income than the labor supply of more-educated workers, particularly on the extensive margin (i.e., the decision whether or not to work).

This paper is organized as follows. The next section provides a brief overview of changes in the Social Security benefits formula. The third section describes the data, instruments and first-stage relationships; the fourth section details the empirical results; and the last section concludes.

2. The Social Security notch

The Social Security notch has been widely studied in the empirical literature (for a detailed description, see Krueger and Pischke, 1992). Because of this, the full details of the legislation that created varying benefits formulas for different cohorts of Social Security beneficiaries will not be rehashed here. Nevertheless, as motivation for the estimation strategy, it is useful to summarize the changes that occurred.

Before 1972, Social Security benefits were related to beneficiaries' average monthly earnings (AME), which were calculated over a worker's entire earnings history. The mapping of AMEs to actual monthly benefits was set by a fixed formula, which Congress updated from time to time to keep up with inflation. In 1972, Congress replaced this ad hoc adjustment mechanism with a system of automatic adjustments based on changes in the consumer price index.

The flaw in this system was that benefits were linked to workers' average *nominal* monthly earnings. As a result, retirees from later cohorts, with higher nominal average wages than their predecessors, received greater real benefits than retirees from earlier cohorts even if their earnings were the same in real terms. Before the 1972 changes, this feature of the benefits formula was relatively benign because Congress based its adjustments on accumulated surpluses. However, unlike the previous system, the automatic adjustments were not contingent on continuing fiscal solvency. Worse, the automatic adjustments were implemented just as the United States entered a period of high inflation. Since inflation outstripped the wage growth that would have otherwise financed the increases, the system accumulated a long-run deficit that would bankrupted it by the early 1980s.

The 1977 amendments to the Social Security Act solved this problem by tying benefits to average indexed monthly earnings (AIME), where the index used to adjust nominal earnings is based on changes in average wages. This eliminated the double-indexation problem, by which new beneficiaries enjoyed the benefits of nominal wage growth (which was reflected in their AMEs) in addition to inflation-based increases. However, the new formula was not applied to everyone—current beneficiaries and those near retirement (i.e., those born before January 1, 1917) were grandfathered under the old rules. This aspect of the Social Security formula, in combination with the fact that different cohorts were exposed to different levels of wage growth over their working lives, generated significant variation in Social Security benefits by recipients' years of birth.

From an analytical perspective, this source of exogenous variation in Social Security benefits is attractive for several reasons. First, the entire population is subject to variation in the Social Security rules. This means that instrumental variables estimates based on this identification strategy will broadly reflect the behavior of the general population.[2] Second, the changes in the Social Security rules were unanticipated, which removes an important potential source of endogeneity bias. Were the changes anticipated, it is conceivable that individuals would have altered their pre-retirement consumption and labor supply, which would have mitigated the effects of these changes. However, the level of public anger over the notch issue strongly suggests that this was not the case. Third, since the Social Security rules are based simply on year of birth, they are not related to other endogenous determinants of income at the individual level, such as unobserved ability or health status. Finally, the changes were large enough in real terms that instruments based on these changes have a strong relationship with beneficiaries' actual Social Security benefits (i.e., there is no "weak instruments" problem (Bound et al., 1995)). This means that estimates based on these instruments will be more efficiently identified.

3. Data, instruments and first-stage relationships

3.1. Data

The empirical work in this paper uses data[3] from the five cohorts that participate in the Health and Retirement Study (HRS), an ongoing panel survey sponsored by the National Institute of Aging. These cohorts have been surveyed over multiple waves from 1992 to 2006. The earliest are the initial HRS cohort, born between 1931 and 1941,

[1] It is worth noting that labor force participation among the elderly in general is significantly higher than most would expect. In 2009, the average labor force participation rate for men ages 75 and higher was 10.3%; for women it was 5.3% (Bureau of Labor Statistics).

[2] A popular criticism of instrumental variables estimates is that they identify local average treatment effects (Angrist and Imbens, 1995). The canonical example is that of using draft lottery numbers as an instrument for military service, to study the effects of military service on wages. The instrumental variables estimate identifies the causal effect of military service only for the population of "compliers," or people who joined the military only because they were drafted. Such people may be quite different from draft-dodgers (who are called but do not go) or volunteers (who go whether or not they are drafted). However, unlike the draft, the Social Security formula determining one's benefits cannot be avoided. Nor, for that matter, can someone volunteer for a formula other than the one to which he or she was assigned based on his or her year of birth.

[3] RAND HRS data file, version J (June 2010).