



Labor supply responses to marginal Social Security benefits: Evidence from discontinuities[☆]

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ABSTRACT

A key question for Social Security reform is whether workers respond to the link on the margin between the Social Security taxes they pay and the Social Security benefits they will receive. We estimate the effects of the marginal Social Security benefits that accrue with additional earnings on three measures of labor supply: retirement age, hours, and labor earnings. We develop a new approach to identifying these incentive effects by exploiting five provisions in the Social Security benefit rules that generate discontinuities in marginal benefits or non-linearities in marginal benefits that converge to discontinuities as uncertainty about the future is resolved. We find that individuals approaching retirement (age 52 and older) respond to the Social Security tax-benefit link on the extensive margin of their labor supply decisions: we estimate that a 10% increase in the net-of-tax share reduces the two-year retirement hazard by a statistically significant 2.0 percentage points from a base rate of 15%. The evidence with regard to labor supply responses on the intensive margin is more mixed: we estimate that the elasticity of hours with respect to the net-of-tax share is 0.42 and statistically significant, but we do not find a statistically significant earnings elasticity. Though we lack statistical power to estimate results within subsamples precisely, the retirement response is driven mostly by the female subsample, while the hours response comes from the male subsample.

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1. Introduction

A common argument is that investment-based Social Security reform will improve economic efficiency by increasing the perceived link between retirement contributions and retirement benefits (Auerbach and Kotlikoff, 1987; Kotlikoff, 1996; Feldstein and Liebman, 2002). Under this argument, individuals currently respond to the Old-Age, Survivors, and Disability Insurance (OASDI) payroll tax as a pure tax, failing to recognize that the payment of Social Security taxes will increase their future Social Security benefits. With personal retirement accounts, by contrast, the link between contributions and future income would be clear, and the economic distortions would be reduced. A notional defined-contribution system could similarly produce efficiency gains by making the tax-benefit link more transparent.

Though economists have long recognized Social Security's tax-benefit link (Browning, 1975; Blinder et al., 1980; Burkhauser and Turner, 1985),

there is little evidence as to whether people respond to the Social Security tax as a pure tax or whether they instead realize that the *effective* marginal Social Security tax rate (the nominal tax rate minus the marginal Social Security benefit rate) is generally lower than the nominal Social Security tax rate. To our knowledge, no papers have examined whether the effective Social Security tax rate affects labor supply as measured by hours or earnings. While there is an extensive literature analyzing the effect of Social Security on retirement, Diamond and Gruber (1999) note that most of this literature ignores the effect of the marginal Social Security benefit rate (focusing instead on the effects of the level of Social Security Wealth). Moreover, as we explain later, nearly all of the papers that do account for accrual confound the retirement incentives with the benefit claiming date incentives. We instead isolate the retirement labor supply incentives. We see this, together with our examination of labor supply responses on the intensive margin (hours and earnings), as the first major contribution of this paper.

A challenge that faces all research on the incentive effects of Social Security is the concern that variation in these incentives may be correlated with unobserved determinants of labor supply. Structural models explicitly exclude such unobserved determinants from the utility function and instead focus on the question of whether the resulting preferences in combination with the Social Security rules can explain observed retirement patterns (Gustman and Steinmeier, 1986, 2005a; Rust and Phelan, 1997; Laitner and Silverman, 2008). Research that exploits variation over time in the Social Security rules can deal

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with this concern by using sharp variation in the generosity of benefits that applies to certain cohorts, as Krueger and Pischke (1992) did when using the variation generated by the “notch generation.”¹ Most research that uses cross-sectional variation in incentives attempts to address the concern by including determinants of these incentives as control variables. This approach has become feasible since the early 1980s when data sets were first matched with administrative Social Security earnings histories. Such matched data were used in papers by Fields and Mitchell (1984), Burtless and Moffitt (1984), Hausman and Wise (1985), Burtless (1986), Sueyoshi (1989), McCarty (1990), Vistnes (1994), and Blau (1997). If *all* determinants of the incentives are included as controls, as is done in Coile (2004) and Coile and Gruber (2007) but not in the earlier papers, the resulting estimates will be identified off of the non-linearities in the incentive schedule that are not absorbed by the control variables. The estimates will be unbiased if unobserved determinants of labor supply are uncorrelated with these non-linearities. This is more likely when the non-linearities are strong and vary across individuals, as is the case with Samwick’s (1998) variation in specific individual plan features across individuals in different firms. As explained in more detail below, we develop a methodology that is similar in spirit to Coile (2004) and Coile and Gruber (2007), but we limit the variation used to estimate incentive effects to those provisions in the Social Security benefit rules that generate discontinuities in incentives. By exploiting this variation exclusively, we eliminate the possibility of bias in our estimates from unobserved determinants of labor supply that are correlated with general non-linearities in the Social Security benefit rules. We see this methodology as the second major contribution of this paper.

The Social Security benefit formula contains a number of provisions that can create large variations in the effective marginal tax rate for otherwise very similar individuals (Boskin et al., 1987; Feldstein and Samwick, 1992). In particular, we exploit discontinuities generated by five provisions of the Social Security benefit formula. First, Social Security benefits depend on only the 35 highest years of indexed earnings, thus creating jumps in effective Social Security tax rates that depend on which years are included among the 35 highest years. Second, an individual receives total benefits that are the greater of either 100% of the person’s own retired worker benefits or 50% of the benefit of the individual’s spouse, thus creating a discontinuity in marginal benefits around the point where the Social Security benefit of one spouse is double that of the other spouse. Third, the provisions governing Social Security benefits for widows and widowers create discontinuities in marginal benefits. Fourth, kink points in the Social Security benefit schedule create discontinuities in marginal benefits, and fifth, there is a discontinuity at the point where the individual reaches sufficient quarters of earnings (generally 40, but lower for earlier cohorts) to become vested.

Together, these five provisions potentially create sharp discontinuities in the effective Social Security tax rate when there is no uncertainty about the future labor supply of the individual and his or her spouse. When there is still uncertainty about future labor supply, these provisions can create non-linearities that converge to discontinuities as the uncertainty gets resolved. We use the term “discontinuities-in-the-limit” to refer both to actual discontinuities and to non-linearities that converge to discontinuities. We develop a variant of the standard regression discontinuity approach so that the effects of the Social Security benefit rules on labor supply are identified off of the variation created by these discontinuities-in-the-limit. Our regressions include linear controls for *all* variables that determine the marginal Social Security tax rate, as well as many interactions and

higher-order terms of these variables. We develop a criterion that determines how flexible these controls need to be in order to preserve sufficient variation due to discontinuities-in-the-limit but absorb virtually all other variation. Since the variation from the discontinuities-in-the-limit identifies our estimates, these estimates would be biased only in the unlikely case that unobserved determinants of labor supply are discontinuous or exhibit strong non-linearities at exactly the same points as the ones created by these five provisions in the Social Security benefit rules. We therefore believe it is reasonable to consider our estimates as measuring the causal effects of marginal Social Security benefits. While our methodology has the important benefit that it only uses the most credible variation, it has two drawbacks. First, limiting the variation used leads to less precise estimates. Second, we estimate labor supply responses to discontinuities in the Social Security benefit rules, which may be more salient and thereby induce stronger responses than other variation in Social Security incentives.

We perform our estimation using observations from the original cohort of the Health and Retirement Study (HRS)² after obtaining permission to link HRS observations to their administrative Social Security earnings records. We find clear evidence that individuals respond to the Social Security tax-benefit link on the extensive margin of their labor supply decisions: we estimate that a 10% increase in the net-of-tax share reduces the two-year retirement hazard by a statistically significant 2.0 percentage points from a base rate of 15%. The evidence with regard to labor supply responses on the intensive margin is more mixed: we estimate that the elasticity of hours with respect to the net-of-tax share is 0.42 and statistically significant. Though the point estimates are also positive, we do not find a statistically significant earnings elasticity.

Qualitatively, and in terms of statistical significance, the extensive-margin labor supply responses are quite robust to changes in specification, but the magnitude of the point estimates varies somewhat across specifications. The intensive-margin labor supply responses are more sensitive to changes in specification. Though we lack statistical power to estimate results within subsamples precisely, the retirement response is statistically significant in the female subsample but not in the male subsample, while the hours response is statistically significant in the male subsample but not in the female subsample. Overall, our results clearly allow us to reject the notion that labor supply is completely unaffected by the tax-benefit link in Social Security.

The rest of this paper proceeds as follows: In Section 2, we explain the provisions in the Social Security benefit rules that give rise to discontinuities-in-the-limit and develop a methodology that exploits variation from these discontinuities-in-the-limit. Section 3 explains the data and our empirical specifications. Section 4 presents the results, and Section 5 concludes.

2. Methodology

2.1. Brief description of the Social Security benefit rules

Social Security retirement benefits in the U.S. are based on a worker’s lifetime earnings record. Each year of earnings during a worker’s career is indexed to the wage level of the year the worker turns 60 by multiplying the earnings by the ratio of average earnings in the year the worker turns 60 to the average earnings in the year in which the earnings were earned. Earnings after age 60 are not indexed. A worker’s average indexed monthly earnings (AIME) are calculated by summing the indexed earnings from the worker’s highest 35 years of indexed earnings (including zeros if the worker

¹ While there has been little sharp variation over time in Social Security benefit rules in the U.S., other countries have made changes in the public pension system that creates effective variation in incentive and income effects across cohorts and years. Manoli et al. (2009) use such variation in the case of Austria to identify the incentive and income effects of the public pension system on retirement decisions.

² The HRS is sponsored by the National Institute of Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan. We use the RAND HRS Version F Data file (2006).

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