

## **The Social Security Earnings Test and Retirement<sup>1</sup>**

Alexander Gelber  
UC Berkeley and NBER

Damon Jones  
University of Chicago and NBER

Daniel W. Sacks  
Indiana University

### **Abstract**

We explore evidence that the Old Age and Survivors Insurance (OASI) Retirement Earnings Test (RET) causes a substantial fraction of OASI claimants not to work. The RET reduces OASI claimants' current OASI benefits as a proportion of earnings, once a claimant earns in excess of an exempt amount, implying that the losses in current benefits due to the RET grow as earnings increase above the exempt amount. We document that the probability of not working also increases much faster above the exempt amount, commensurate with the increasing "bite" of the RET. This suggests that work decisions are sensitive to the RET.

---

<sup>1</sup> This research was supported by the U.S. Social Security Administration through grant #RRC08098400-06-00 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 author(s) and do not represent the views of SSA, any agency of the Federal Government, or the NBER. We are extremely grateful to David Pattison for running our code on the data. We thank Jim Cole and Joel Slemrod for their help. All errors are our own.

## 1. Introduction

A swell of recent papers has examined intensive margin responses—i.e. the choice of earnings or hours worked, conditional on earning or working a positive amount—to kink points or notches in the effective tax schedule (e.g. Saez 2010; Chetty, Friedman, Olsen, and Pistaferri 2011; Manoli and Weber 2012; Kleven and Waseem 2013). This follows a long line of previous literature that examined intensive margin earnings or labor supply responses to non-linear budget sets (e.g. Hausman 1981; Burtless and Moffitt 1985; Friedberg, 1998, 2000; Blundell and Hoynes 2004). We add to this literature by using non-linearities in the budget set to examine choices along the extensive margin—the choice to earn zero or a positive amount.<sup>2</sup> In this paper, we show that extensive margin responses are important in the case of the Social Security Retirement Earnings Test (RET), complementing earlier evidence of a large intensive margin response (Friedberg 1998, 2000; Song and Manchester 2007; Gelber, Jones, and Sacks 2013) and illustrating the importance of taking account of the extensive margin. Our results suggest that the RET may be an important factor determining work decisions of the elderly in the U.S.

The RET reduces OASI claimants' current OASI benefits as a proportion of earnings, once a claimant earns in excess of an exempt amount. For example, for OASI claimants aged 62-65 in 2013, current OASI benefits are reduced by one dollar for every extra two dollars earned above \$15,120. Reductions in current benefits due to the RET sometimes lead to increases in later benefits; nonetheless, as we discuss in detail, several factors may explain why individuals' earnings still respond to the RET. Below the exempt amount, an increase in earnings does not impact the amount of benefits reduced due to the RET, but above the exempt amount, an increase in earnings does impact the amount reduced. Among OASI claimants, the retirement hazard increases much faster above the exempt amount, paralleling the increase in benefit reduction above the exempt amount. This pattern does not appear in any of several placebo samples that are not subject to the RET. Thus, we find evidence that the discontinuous increase in the slope of the retirement

---

<sup>2</sup> See Kleven, Landais, Saez and Schultz (2013) for an exploration of extensive margin decisions, i.e. migration, in response to a notch in the budget set.

hazard is causally related to the presence of the RET.

Our work relates to long lines of previous research on the effect of pensions on retirement (Gruber and Wise 2004; Asch, Haider and Zissimopoulos 2005; Coile and Gruber 2007; Liebman, Luttmer, and Seif 2009; Mastrobuoni 2009; and Brown 2013), and on extensive margin decisions (e.g. Cogan 1981). Research has examined the effect of the RET in particular on retirement and claiming decisions using a differences-in-differences framework, including Gruber and Orszag (2003) and Haider and Loughran (2008). Other research has documented a strong intensive margin response to the RET (Burtless and Moffitt 1985; Friedberg 1998, 2000; Song and Manchester 2007; Gelber, Jones, and Sacks 2013).

We complement these studies and add to them in at least three novel ways. First, the effect of the RET on subsequent retirement that we find is visually clear and large. Second, our evidence relating to the RET and retirement is based on showing a discontinuous change in the slope of the retirement hazard near the exempt amount, which complements earlier work based on the differences-in-differences strategy.<sup>3</sup> Third, our study is one of the first to use non-linearities in the budget set to identify extensive margin earnings responses.<sup>4</sup>

The paper proceeds as follows. Section 2 describes the policies we examine. Section 3 describes our data. Section 4 presents empirical evidence on the extensive and intensive margin response to the RET. Section 5 discusses a number of candidate models (described in greater detail in the Appendix) that could explain the patterns in the data. Section 6 concludes with discussion and avenues for future work.

## **2. Policy Environment**

---

<sup>3</sup> Our evidence on the retirement effect of the RET is not directly comparable to previous evidence because we examine the subsequent retirement effect of the RET, as opposed to previous studies that have examined the contemporaneous effect.

<sup>4</sup> Kleven et al. (2014) study migration responses to a notched tax scheme on high-earning immigrants in Denmark, while Kopeczuk and Munroe (2014) examine extensive margin responses to budget set non-linearities in the context of responses to a tax on real estate. Alpert and Powell (2014) develop a method to estimate both intensive and extensive margin responses to taxes on a non-linear budget set.

Figure 1 shows key features of the RET rules from 1961 to 2009. The dashed line and right vertical axis show the benefit reduction rate. Until 1990, every two dollars of earnings above the exempt amount reduced OASI benefits by one dollar (until OASI benefits reached zero) for individuals subject to the RET above the Early Retirement Age of 62. From 1990 to 1999, every additional two dollars of earnings above the exempt amount reduced OASI benefits by one dollar (until OASI benefits reached zero) for individuals at or under the Normal Retirement Age (NRA), and for beneficiaries above the NRA, every additional three dollars of earnings above the exempt amount reduced OASI benefits by one dollar.<sup>5</sup> Due to this reduction in benefits, we later model the RET as creating a positive implicit marginal tax rate for some individuals, consistent with the empirical finding that some individuals retire in response to the RET and bunch at the RET exempt amount, certain theoretical considerations we describe below, and previous literature.<sup>6</sup> Starting in 2000, the RET was eliminated for those NRA and above. The solid line and left vertical axis show the real exempt amount over time.<sup>7</sup>

### **Benefit Enhancement**

When current OASI benefits are lost to the RET, future scheduled benefits are increased in some circumstances. This is sometimes called "benefit enhancement." Benefit enhancement can reduce the effective tax rate associated with the RET, in particular for those individuals considering earning enough to trigger the enhancement in the post-1972 period.

---

<sup>5</sup> The NRA, the age at which workers can claim their full OASI benefits, is 65 for those born 1937 and before, rises by two months a year for cohorts between 1938 and 1943, is constant at age 66 for cohorts between 1943 and 1954, and rises by two months a year until reaching age 67 for those born in 1960 and later.

<sup>6</sup> An additional important decision concerns the decision to claim OASI. We abstract from the claiming decision by examining a sample of OASI claimants in our main sample, following previous literature such as Friedberg (1998, 2000). However, it is worth noting that if the RET affects the claiming decision, there is no a priori reason that this change in claiming should increase or decrease the magnitude of the extensive margin responses we document among claimants. Moreover, we add to previous literature by showing that the hazard of claiming at year  $t+1$  appears smooth around the exempt amount at year  $t$ , indicating no evidence that claimants come disproportionately from close to or far from the kink. We later discuss the claiming decision further.

<sup>7</sup> The exempt amount has not been a "focal" earnings level—such as \$1,000, \$5000, or \$10,000—that could lead to bunching at the exempt amount even in the absence of RET. Indeed, in our main period of study we find no evidence of bunching at the exempt amount among those younger than the ages to which the RET applies.

For beneficiaries under NRA, the actuarial adjustment raises future benefits whenever a claimant earns any amount over the RET exempt amount.<sup>8</sup> Future benefits are raised by 0.55 percent per month of benefits withheld for the first three years of RET assessment. In the budget set, this creates a notch in future benefits as well as a kink in current benefits at the RET threshold. This notch has the feature that future benefits increase discontinuously when moving from just under to just over the exempt amount.

For beneficiaries subject to the RET aged NRA and older, a one percent Delayed Retirement Credit (DRC) was introduced in 1972, meaning that each year of benefits foregone led to a one percent increase in future yearly benefits. The DRC was raised to three percent in 1982 and gradually rose to eight percent for cohorts reaching NRA from 1990 to 2008 (though the RET was eliminated in 2000 for those older than the NRA). An increase in future benefits between seven and eight percent is approximately actuarially fair on average, meaning that a claimant with no liquidity constraints and average life expectancy should be indifferent between either claiming benefits now or delaying claiming and receiving higher benefits once she begins to collect OASI (as Diamond and Gruber 1999 show with respect to the actuarial adjustment for early claiming). OASI claimants' future benefits are only raised due to the DRC when annual earnings are sufficiently high that the individual loses an entire month's worth of OASI benefits due to the reductions associated with the RET (Friedberg 1998; Social Security Administration 2012). As a result, at or just above the RET threshold, earning an extra dollar does not affect subsequent OASI benefits; benefit enhancement is only relevant to a claimant considering earning substantially in excess of the exempt amount.

### **Additional Effects of RET on Incentives**

When considering the incentives the RET creates, a number of additional considerations are relevant. First, the RET was on average roughly actuarially fair only beginning in the

---

<sup>8</sup> Social Security Administration (2012), Section 728.2; Gruber and Orszag (2003). Formally, the number of months' of benefit enhancement received by an OASI recipient with earnings  $z$ , monthly benefits  $MB$ , and facing a benefit reduction rate  $\tau$  above the exempt amount  $z^*$ , is  $\text{floor}\left(\tau \times \frac{(z-z^*)}{mb}\right)$  for those NRA and above, and  $\text{ceiling}\left(\tau \times \frac{(z-z^*)}{mb}\right)$  for those below NRA.

late 1990s. Second, for liquidity-constrained individuals, those whose expected lifespan is shorter than average, or those who discount particularly quickly, the RET reduces lifetime Social Security wealth more—and such individuals could also choose to reduce work in response to the RET. Finally, many individuals also may not understand the RET benefit enhancement or other aspects of OASI (Liebman and Luttmer 2011; Brown, Kapteyn, Mitchell, and Mattox 2013).

### 3. Data

We primarily rely on the Benefits and Earnings Public Use File (BEPUF). The BEPUF is a 1 percent extract of OASI beneficiaries in 2004. The data contain a complete longitudinal earnings history from 1951 to 2003 with yearly information on earnings; the type and amount of yearly Social Security benefits a claimant receives; year of birth; the year (if any) that claiming began; and sex (among other variables). The measure of earnings reflects total wage compensation, as reported on Internal Revenue Service (IRS) forms. To prevent identification of individual earnings histories, earnings are randomly rounded, usually to the nearest \$25 or \$100 in our data.<sup>9</sup>

Several features of the data are worth discussion. First, these administrative data are subject to little measurement error (aside from random rounding). Second, earnings (as measured in the dataset) are the base for FICA taxes and are not subject to manipulation through tax deductions, credits, or exemptions. Third, because earnings are taken from the W-2 form, they are subject to third-party reporting among the non-self-employed; third-party reporting has been found in the literature to greatly reduce evasion (Kleven *et al.* 2011). This limits the degree to which observed bunching among the non-self-employed—to whom we limit our sample—could reflect reporting issues. Fourth, the data do not contain information on hours worked or amenities at individuals' jobs.

Table 1 shows summary statistics for our main sample, which looks at people with positive earnings at age 61 who claim at age 62. Dollars throughout the paper are

---

<sup>9</sup> See <http://www.ssa.gov/policy/docs/microdata/earn/>

measured in thousands of \$2010. Younger ages show higher mean earnings and lower probability of having zero earnings.

#### **4. Extensive Margin Incentives Created by RET**

Figure 2 shows the benefit reduction due to the RET. As shown in Figure 2, under the exempt amount, benefits are not reduced. Above the exempt amount, the slope of benefit reduction changes discontinuously to the RET benefit reduction rate. The farther above the exempt amount, the more is reduced by the RET (until one reaches zero benefits). Figure 3 shows the extensive margin incentives that this creates. As shown in the Figure, the slope of the average net-of-tax rate (the fraction of one's income that one keeps, net of taxes and the RET) discontinuously decreases at the exempt amount. The reason is that the RET begins removing benefits discontinuously faster at the exempt amount (Figure 2), so the fraction of one's income that one keeps begins to decrease discontinuously faster around the exempt amount.

Figure 4 shows the expected response: the slope of the probability of retirement increases around the exempt amount, paralleling the increase in the slope of benefit reduction at the exempt amount.<sup>10</sup> Phrased differently, the losses in current benefits due to the RET grow as earnings increase above the exempt amount; we examine whether retirement also grows above the exempt amount, commensurate with the increasing “bite” of the RET. If the RET causes retirement, we would expect increasing prevalence of retirement as we move above the exempt amount, as the losses in current OASI benefits due to the RET steadily increase. As we show in the next section, our empirical results show patterns very similar to this predicted response.

#### **5. Extensive Margin Response to RET**

---

<sup>10</sup> In work in progress, we show that such a response—specifically, an increase in the slope of the retirement probability at the exempt amount—will be expected when individuals face constraints on their earnings at the intensive margin.

Figure 5 shows the key patterns we rely on, which prove to be visually clear.<sup>11</sup> In the figure, on the x-axis are earnings at 61, which reflects earnings in the absence of the Earnings Test. On the y-axis is the probability of having positive earnings at another age. The vertical line represents the exempt amount. We pool data across all years of the BEPUF.

In our main sample, we examine the probability of having positive earnings among 63 year-olds who claimed OASI at age 62. The reason we examine those who claimed in the previous year is as follows. We only observe calendar year of claiming (not month), and we observe only calendar year earnings. In calendar year  $t$ , the RET applies only to months after individual claims. An individual could be claiming OASI for only small portion of year; for example, one might claim OASI in December of a given year. If an individual earns for any part of year, she will have earnings greater than zero, which is our main outcome. Thus, it is not clear whether we should expect to see any measurable participation response at age 62 among those claiming at age 62. As a result, we examine participation in the calendar year when an individual turns 63.<sup>12</sup>

The upper-left panel of Figure 5 shows that among 63 year-olds claimants under the exempt amount, the probability of retirement slopes downward. However, just at the exempt amount, the pattern changes sharply: the probability of retirement begins to slope upward. Our method effectively relates this sharp change to the sharp change in the RET that also occurs at the exempt amount.

Our confidence in these results is reinforced by the fact that no such reversal of slope occurs in any of three “placebo” samples that are not affected by the RET. Figure 5 shows this clearly. Among three comparison groups unaffected by the RET—61 year-olds (upper right panel), 63 year-old non-claimants (bottom left), and among individuals

---

<sup>11</sup> We use the Benefits and Earnings Public Use File, a one percent sample of OASI beneficiaries in 2004 that longitudinally follows earnings in each year from 1951 to 2003, and the Earnings Public Use File, a one percent sample of Social Security Numbers that also longitudinally follows earnings in each year from 1951 to 2006. For some analysis we are also able to use the Social Security Master Earnings File.

<sup>12</sup> If the individual claims OASI at age 62, she is almost always claiming for the entirety of the calendar year she turns 63.



in the years *prior* to claiming OASI (bottom right)—there is no sharp change in behavior around the exempt amount. In fact, in all three of these groups, the proportion retiring continues to slope downward steadily throughout the entire range of earnings.

*No selection on claiming status*

The results in Figure 5 condition on claiming status, which is a potential outcome variable in the sense that claiming decisions in principle could be affected by the Earnings Test. However, Figure 6 shows that the probability of claiming OASI at age 62 (as a function of earnings at age 61) shows no visually apparent (and no statistically significant) change in slope through the exempt amount. Thus, claiming appears to be unaffected by the Earnings Test in our sample. This is plausible if individuals are unaware of the rules of the Earnings Test prior to claiming (but later respond in their participation decisions because they become aware of the rules through experience), or if claiming decisions at age 62 are inelastic for another reason.

## **6. Conclusion**

We document a novel fact: the slope of the retirement hazard increases substantially and discontinuously around the RET exempt amount. This parallels the increase in the slope of benefit reduction around the exempt amount. Future work will develop a model to explain and quantify these responses.

These results suggest that the RET may be an important factor causing retirement under NRA. More generally, our results suggest that the retirement decisions of the elderly may be quite sensitive to incentives. However, we also emphasize that in evaluating the desirability of the RET, the retirement response is only one of several important factors. For example, some observers laud the RET's enhancement of benefits for older OASI recipients. Research will continue to illuminate both the magnitude of the costs and benefits of the RET.

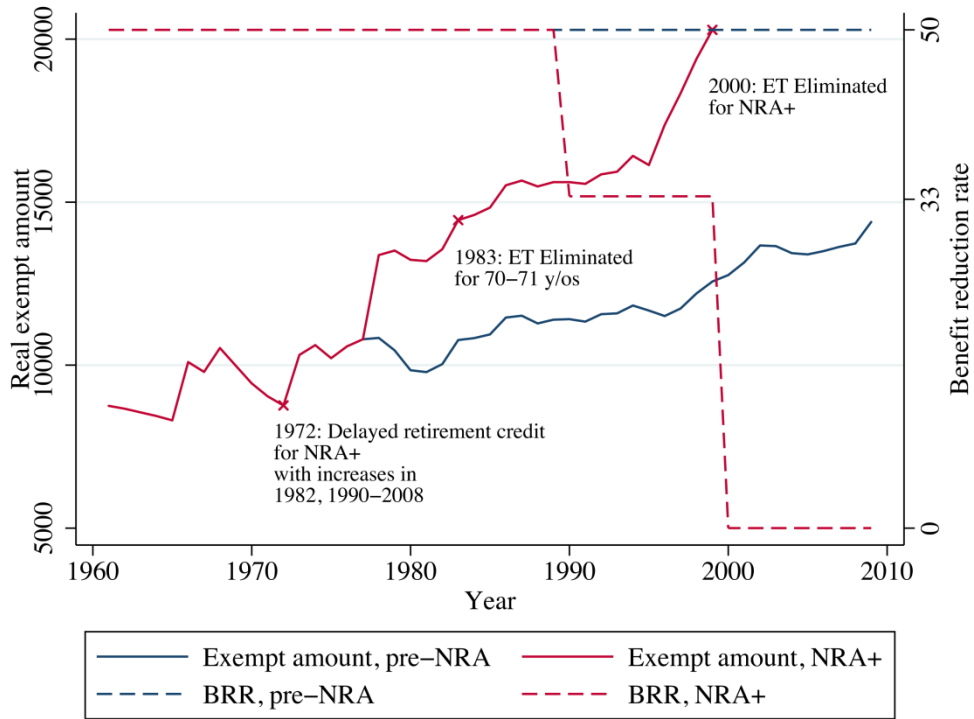
## References

- Alpert, Abby, and David Powell.** (2014). "Estimating Intensive and Extensive Tax Responsiveness: Do Older Workers Respond to Income Taxes?" RAND Working Paper.
- Altonji, Joseph G. and Christina H. Paxson** (1988), "Labor Supply Preferences, Hours Constraints, and Hours-Wage Trade-Offs," *Journal of Labor Economics*, 6, 254-276.
- Asch, B., S. J. Haider, and J. Zissimopoulos (2005).** Financial incentives and retirement: evidence from federal civil service workers. *Journal of Public Economics* 89(2), 427-440.
- Brown, K. M.** (2013). The link between pensions and retirement timing: Lessons from California teachers. *Journal of Public Economics* 98, 1-14.
- Brown, Jeffrey, Arie Kapteyn, Olivia Mitchell, and Teryn Mattox.** "Framing the Social Security Earnings Test." Wharton Pension Research Council Working Paper WP2013-06.
- Burtless, G., & Hausman, J. A.** (1978). The effect of taxation on labor supply: Evaluating the Gary negative income tax experiment. *The Journal of Political Economy*, 1103-1130.
- Burtless, Gary and Robert A. Moffitt** (1985), "The Joint Choice of Retirement Age and Postretirement Hours of Work." *Journal of Labor Economics*, 3, 209-236.
- Chetty, Raj, Adam Guren, Day Manoli, and Andrea Weber** (2012), "Does Indivisible Labor Explain the Difference Between Micro and Macro Elasticities? A Meta-Analysis of Extensive Margin Elasticities." In *NBER Macroeconomics Annual 2012* (Daron Acemoglu, Jonathan Parker, and Michael Woodford, eds.), vol. 27, University of Chicago Press.
- Chetty, Raj, Adam Looney, and Kory Kroft** (2009), "Salience and Taxation: Theory and Evidence." *American Economic Review*, 99, 1145-1177.
- Cogan, John** (1981), "Fixed Costs and Labor Supply." *Econometrica*, 49, 945-963.
- Coile, Courtney, and Jonathan Gruber** (2001), "Social security incentives for retirement." In *Themes in the Economics of Aging* (David Wise, Ed.), 311-354, University of Chicago Press.
- Coile, C. and J. Gruber** (2007). Future social security entitlements and the retirement decision. *Review of Economics and Statistics* 89(2), 234-246.

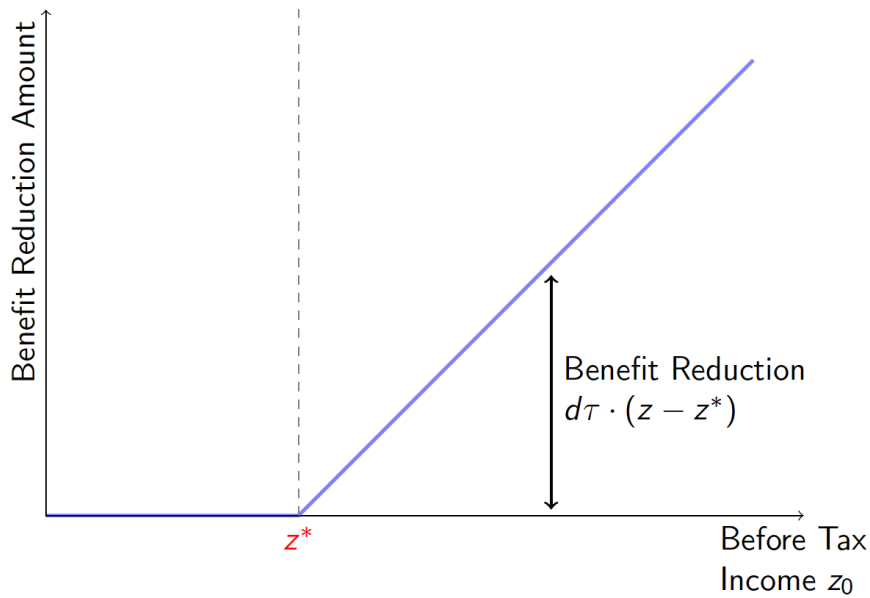
- Diamond, Peter, and Jonathan Gruber** (1999), "Social Security and Retirement in the United States." In *Social Security and Retirement around the World* (Jonathan Gruber and David Wise, eds.), 437-473, University of Chicago Press.
- Friedberg, Leora** (1998), "The Social Security earnings test and labor supply of older men." In *Tax Policy and the Economy* (James M. Poterba, ed.), 121-150, University of Chicago Press.
- Friedberg, Leora** (2000), "The Labor Supply Effects of the Social Security Earnings Test." *Review of Economics and Statistics*, 82, 48--63.
- Gelber, Alexander, Damon Jones, and Daniel Sacks** (2013), "Earnings Adjustment Frictions: Evidence from the Social Security Earnings Test." NBER Working Paper 19491.
- Gruber, Jonathan and Peter Orszag** (2003), "Does the Social Security Earnings Test Affect Labor Supply and Benefits Receipt?" *National Tax Journal*, 56, 755--773.
- Hausman, Jerry A.** (1981), "Labor Supply." In *How Taxes Affect Economic Behavior* (Henry J. Aaron and Joseph A. Pechman, Eds.), 27-71, Brookings Institution.
- Hoopes, Jeffrey, Daniel Reck, and Joel Slemrod** (2013), "Taxpayer Search for Information: Implications for Rational Attention." University of Michigan Working Paper.
- Kleven, Henrik, Martin Knudsen, Claus Kreiner, Søren Pedersen, and Emmanuel Saez** (2011), "Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark." *Econometrica*, 79, 651-692.
- Kleven, Henrik, Camille Landais, Emmanuel Saez and Esben Schultz** (2014), "Migration and Wage Effects of Taxing Top Earners: Evidence from the Foreigners' Tax Scheme in Denmark." *The Quarterly Journal of Economics*, 129(1), 333-378
- Kleven, Henrik and Mazhar Waseem** (2013), "Using Notches to Uncover Optimization Frictions and Structural Elasticities: Theory and Evidence from Pakistan." *Quarterly Journal of Economics*, 128, 669-723.
- Kopczuk, Wojciech, and David Munroe** (2014), "Mansion Tax: The effect of Transfer Taxes on the Residential Real Estate Market." Forthcoming, *American Economic Journal: Economic Policy*.
- Liebman, Jeffrey B., and Erzo F.P. Luttmer** (2011), "Would People Behave Differently If They Better Understood Social Security? Evidence From a Field Experiment." NBER Working Paper 17287.

- Liebman, Jeffrey B., Erzo F.P. Luttmer, and David Seif** (2009), "Labor Supply Responses to Marginal Social Security Benefits: Evidence from Discontinuities," *Journal of Public Economics*, 93, 1208-1223.
- Mastrobuoni, G.** (2009). Labor supply effects of the recent social security benefit cuts: Empirical estimates using cohort discontinuities. *Journal of Public Economics* 93(11), 1224-1233.
- Saez, Emmanuel** (2010), "Do Taxpayers Bunch at Kink Points?" *American Economic Journal: Economic Policy*, 2, 180-212.
- Social Security Administration** (2012a), Annual Statistical Supplement. Washington, D.C.
- Social Security Administration** (2012b), Social Security Handbook. Washington, D.C.
- Song, Jae G. and Joyce Manchester** (2007), "New evidence on earnings and benefit claims following changes in the retirement earnings test in 2000." *Journal of Public Economics*, 91, 669-700.
- Utendorf, Kevin R.** (2001/2), "The Upper Part of the Earnings Distribution in the United States: How Has It Changed?" *Social Security Bulletin*, 64, 1-11.

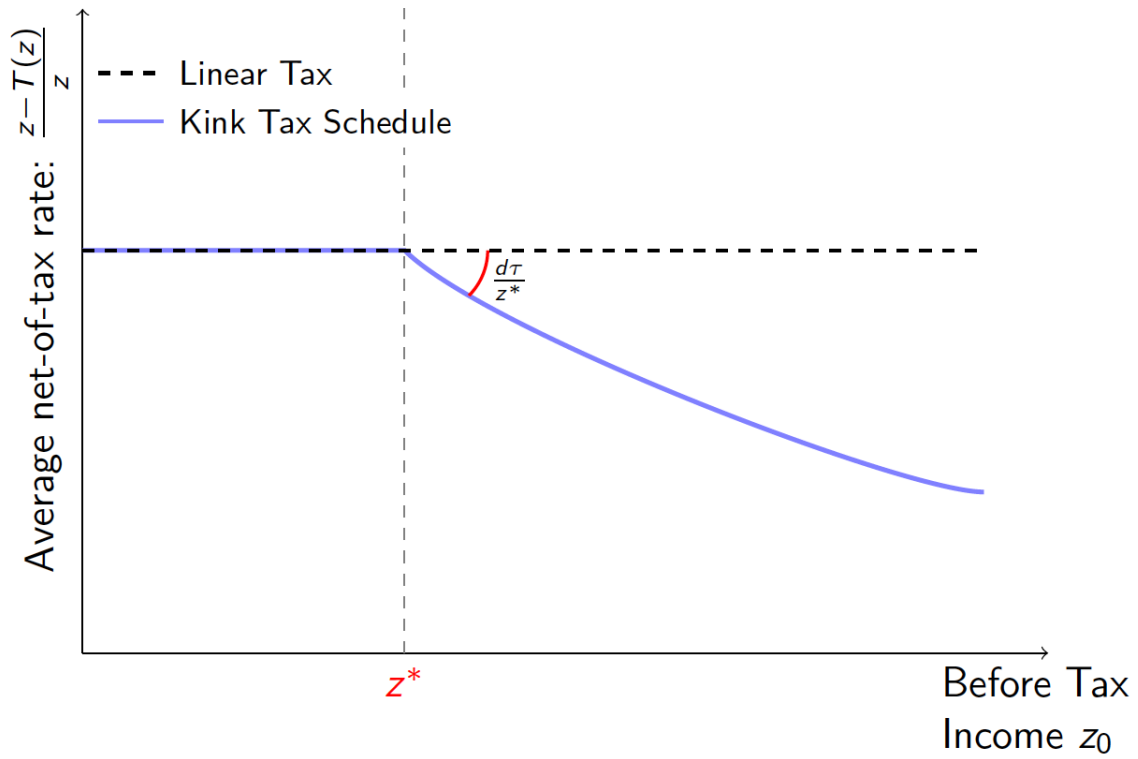
**Figure 1: Key Earnings Test Rules, 1961-2009**



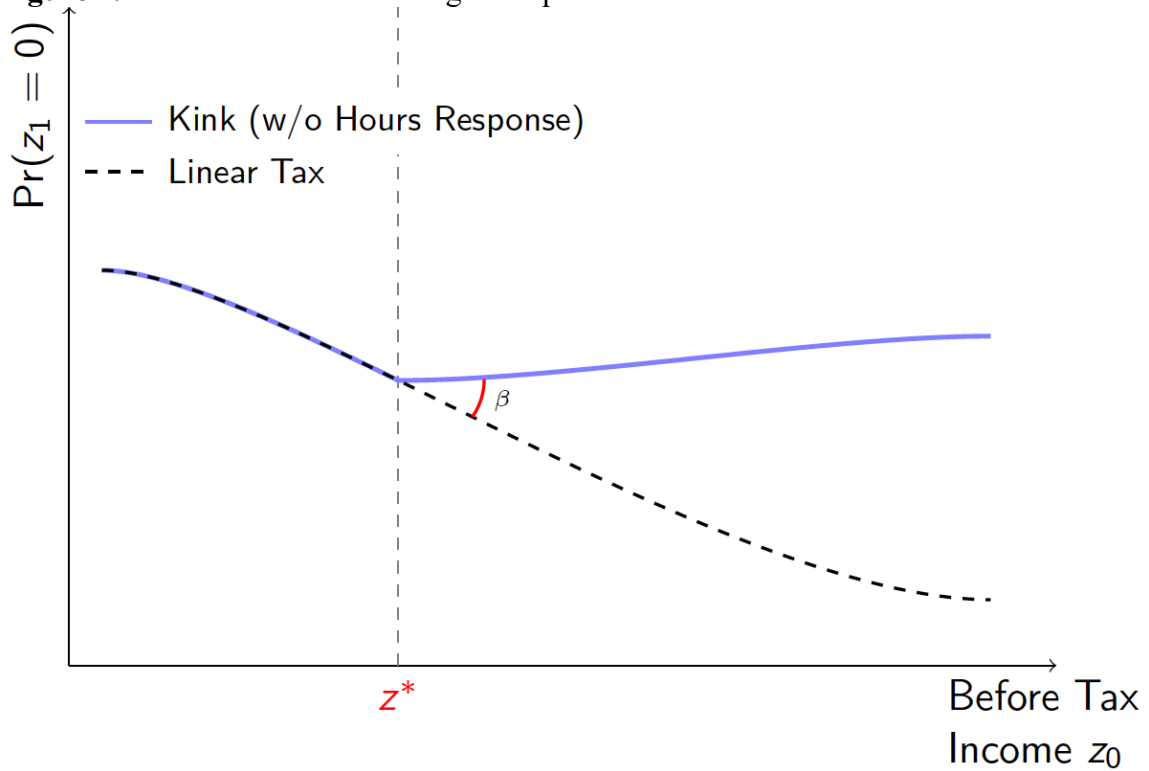
**Figure 2: Benefit Reduction due to RET**



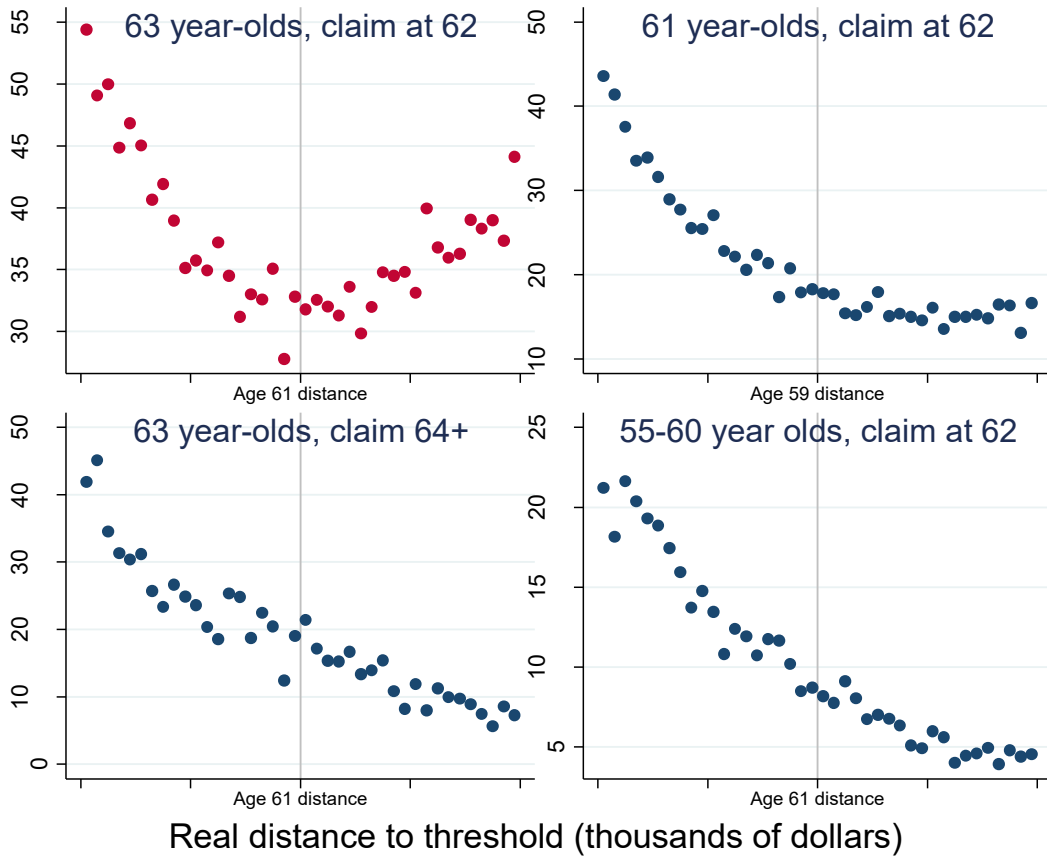
**Figure 3.** Extensive Margin Incentives



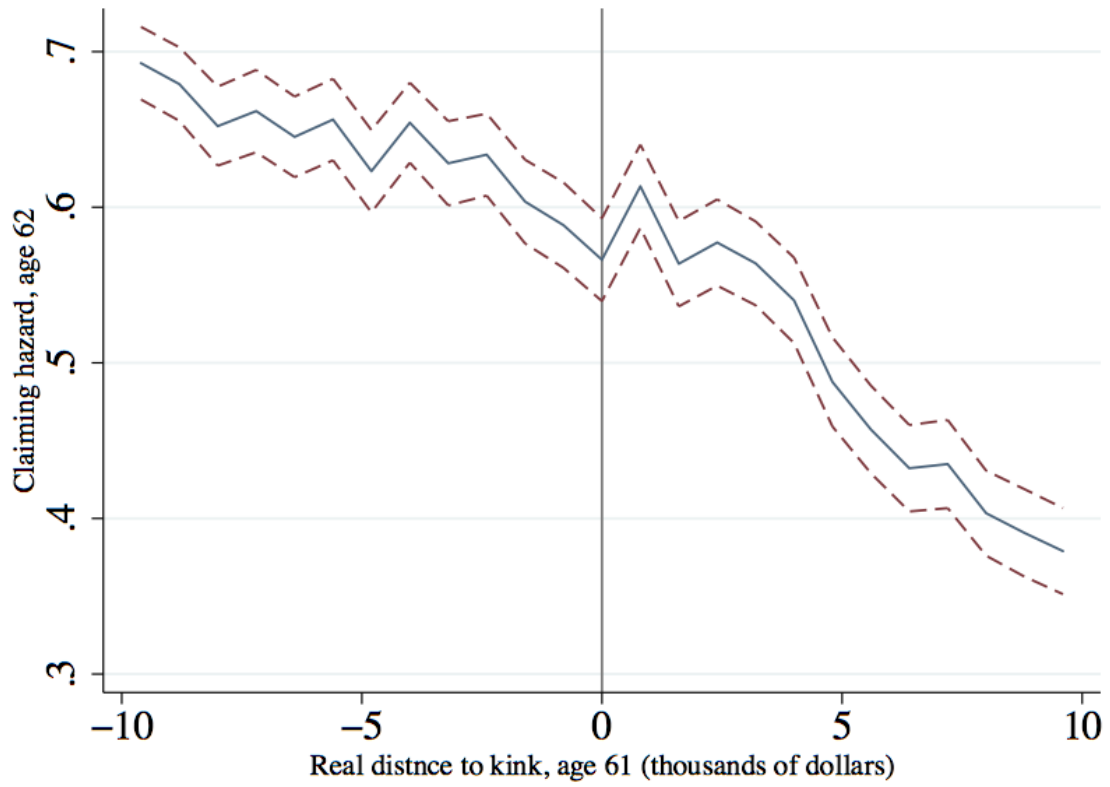
**Figure 4.** Predicted Extensive Margin Response



**Figure 5.** Pattern of Retirement Near Exempt Amount, Main Sample and Placebo Samples



**Figure 6.** Probability of claiming OASI at age 62, as a function of earnings at age 61



Source: Social Security Master Earnings File, one percent random sample.



**Table 1:** Summary Statistics: Mean (Standard Deviation)

	Level	Pr(0)
<i>Earnings</i>		
Age 61	24.46 (22.84)	0.00 (0.00)
Age 62	12.92 (16.24)	18.76 (39.04)
Age 63	4.30 (7.56)	46.33 (49.87)
Age 62-69	5.18 (6.56)	51.05 (37.49)
Age 55-60	30.67 (23.29)	8.05 (19.90)
PIA	0.99 (0.40)	0.00 (0.00)

Source: BEPUF. N=65,600. The sample consists of individuals who earn a positive amount at age 61 who claim OASI at age 62. The Pr(0) column shows the probability that earnings or PIA equal zero in the group specified. Dollars are measured in thousands of \$2012.