



8-2002

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## Recommended Citation

Rubb, Stephen D., "US Social Security Rules in the 1990s: A Natural Experiment in Myopic and Farsighted Behaviour" (2002).  
*WCOB Faculty Publications*. Paper 174.

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# *US Social Security rules in the 1990s: a natural experiment in myopic and farsighted behaviour*

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During the 1990s changes in the earnings test threshold and the delayed retirement credit had the potential to impact the labour supply of 65 to 69-year-olds. These changes in Social Security rules are used to examine whether labour supply behaviour of elderly men and women is ‘myopic’ or ‘farsighted’. Men are found to be more farsighted than previously realized, perhaps due to increases in life expectancy.

## I. INTRODUCTION

During the 1990s two changes in US Social Security (SS) rules may have altered work effort by individuals age 65 to 69. One involved an adjustment to SS’s earnings test (ET). At the time, the ET reduced SS benefits by 33 cents for every US dollar in earnings above the threshold. Prior to 1996, the threshold was adjusted annually based on wage inflation. From 1996 to 1999 the threshold was steadily increased. The second change involved legislated increases in the delayed retirement credit (DRC). Any individual age 65 to 69 who forgoes the collection of benefits, perhaps as the result of the ET, receives higher future benefits via the DRC for the remainder of the recipient’s life.

Table 1 shows recent changes in the DRC and in the ET threshold. In 1997, a 65-year-old with potential SS benefits of US\$10 000 and earnings of US\$28 500 (US\$15 000 above the US\$13 500 threshold), would have an ET penalty of US\$5000 (one-third of US\$15 000). Having received half the potential benefits, the individual would be entitled to 2.5% (half the 5.0% DRC) higher future benefits.

If individuals behave in a way that is ‘myopic’, concerned with current benefits, changes in the DRC will have little impact on behaviour. Only ‘farsighted’ individuals will respond to such changes. Conversely, myopic indi-

viduals will be more inclined to respond to changes in the threshold.

This paper tests for the labour supply response of working elderly to the above-mentioned rule changes during the years 1994–1999. It is the first known empirical study to examine how these rule changes impacted hours worked by 65 to 69-year-old, *ex post*, at the microlevel.

## II. THEORETICAL EXPECTATIONS AND A BRIEF LITERATURE REVIEW

The theoretical expectations of the ET on labour supply are ambiguous. The ET effectively lowers a working beneficiary’s wage rate net of SS benefits when earnings exceed the threshold. This creates a disincentive for individuals to have earnings above the threshold. Raising the threshold counteracts this disincentive; however, the impact on hours worked remains uncertain due to offsetting substitution and income effects.<sup>1</sup>

The introduction of the DRC further complicates the analysis because when current benefits are reduced, future benefits are increased. Since future benefits have a present value, the DRC offsets the impact of the ET. For some, a higher DRC encourages work effort by increasing net wages. This unrealistically assumes a normal life expect-

<sup>1</sup> Increasing the threshold gave individuals with earnings at the threshold an incentive to increase hours. The increase also allowed some individuals to collect benefits otherwise completely foregone, reducing net marginal wages by a third. Both the income and substitution effects predict a decline in hours worked.

Table 1. *Earnings test threshold and delayed retirement credit*

Year	Threshold	DRC%	Year	Threshold	DRC%
1990	\$ 9300	3.5	1995	\$11 280	4.5
1991	\$ 9720	3.5	1996	\$12 500	5.0
1992	£10 200	4.0	1997	\$13 500	5.0
1993	\$10 560	4.0	1998	\$14 500	5.5
1994	\$11 160	4.5	1999	\$15 500	5.5

Notes: DRC is for an individual turning 65 during year in question.

tancy, a dominant substitution effect, the absences of a liquidity constraint, and a lack of myopic and risk adverse behaviour.

Using data from the annual March Current Population Surveys (CPS), Gruber and Orszag (2000) (GO) examined changes in the threshold that occurred over a 25-year period (1973–1998) at the macrolevel. They concluded that increases to the threshold did not have a statistically significant impact on hours worked, conditional on employment. Also during CPS data, Friedberg (2000) (FR) analysed three previous SS rule changes (1978, 1983, and 1990). With these results FR estimated that raising the threshold to US\$30 000 would result in ‘a slight decline in labour supply (p. 61)’.<sup>2</sup> FR also estimated that changes in the DRC would have no impact on labour supply.

In ‘Responses to social security by men and women: myopic and far sighted behavior’ Reimers and Honig (1996, p. 359) (RH) stated that ‘women respond to SS wealth (increases in the DRC) and are not deterred from working by the ET, while men respond to current benefits’. Using data from the Longitudinal Retirement History Study (1969 to 1979), Reimers and Honig (1993) focused on labour force re-entry using a hazard function that does not allow for the possibility of changes in continued employment and does not account for adjustments in annual hours. It remains a possibility that an individual continue their career occupations longer as a result of the changes in SS rules.

RH noted several gender differences that may impact reactions to recent changes in SS rules. First, labour supply patterns are different, with median annual hours of men and women 1350 and 1040, respectively.<sup>3</sup> Second, the higher observed wages of men (median of US\$14.00 versus US\$9.98 for women) make men more likely to be impacted by the uniform ET. Third, women have a longer life expectancy, thus benefit more by delaying retirement. Fourth, as noted by Barsky *et al.* (1993), men are less risk adverse than women. Finally, RH noted men generally have more assets and face less of a liquidity constraint. Given gender differences in each of these areas, it is not possible to predict *a priori* how each gender will respond to changes in SS rules.

Differences between earlier time periods and the 1990s are worth noting. During the time frame of the previous studies, working beneficiaries had a more severe ET penalty that started at a considerably lower threshold. Given the above-mentioned gender differences with respect to hours and wages, fewer working women are directly impacted by the ET in the 1990s. Lastly, both genders should engage in more farsighted behaviour due to recent increases in life expectancy.

### III. EMPIRICAL STRATEGY AND RESULTS

The data used in this study came from the March 1995 to March 2000 CPS. The years 1994 to 1999 are chosen to avoid implications of changing policies regarding the taxation of SS benefits. Beginning in 1994, up to 80% of an individual’s SS benefits were potentially taxable.

CPS data reflects an individual’s age during March of the following year. As is noted in GO, this leads to ambiguity as to the individual’s actual age during the year in question. Accordingly, a conservative approach of including only individuals age 66 to 69 is taken. This ambiguity leads to uncertainty with respect to some individuals DRC. An adjusted DRC is calculated with the belief that roughly a fifth of individuals surveyed in March had their last birthday during the current year. An individual age 65 during the survey in March 1995 would unambiguously have a DRC of 4.5%. An individual age 65 during the March

Table 2. *Description of variables*

Variables	Description of variables
<i>AGE</i>	own age minus 62
<i>DRC</i>	delayed retirement credit for individuals eligible for SS (adjusted and unadjusted)
<i>DRC(NO_SS)</i>	potential DRC for individual ineligible for SS (adjusted and unadjusted)
<i>ED11</i>	1 if educational attainment through grade 11
<i>ED13</i>	1 if educational attainment includes some college
<i>ED16</i>	1 if educational attainment is 4 years of college
<i>ED17</i>	1 if educational attainment is 5+ years of college
<i>HEALTH</i>	1 if individuals has self reported health problem
<i>LF_FY</i>	other family income; excludes own earnings & SS benefits
<i>LN_PY</i>	other personal income, excludes own earnings & SS benefits
<i>MARRIED</i>	1 if married with spouse present
<i>METRO</i>	1 if residence in a MSA
<i>NO_SS</i>	1 if individual not believed to be eligible for SS
<i>STATEUER</i>	annual state unemployment rate
<i>WAGE</i>	natural log of estimated average hourly wage
<i>THRESHOLD</i>	real earnings test threshold (in US\$100s)

Note: All dollar values in 1999 prices. Natural log of income plus one is used.

<sup>2</sup> The threshold was legislated to increase to US\$30 000 in 2002; however, in 2000 lawmakers eliminated the ET for individuals age 65 to 69.

<sup>3</sup> According to estimates based on those included in this paper’s analysis.

1996 survey may have turned 65 during 1995 (DRC of 4.5%) or during 1996 (DRC of 5.0%). For such individuals an adjusted DRC of 4.6% is estimated (reflecting a fifth of the 0.5 percentage point difference). All models are run twice, once with an adjusted DRC and once with an unadjusted DRC.

The data consists only of working individuals with non-negative incomes (described in Table 2) in order to compute the natural log of these values. Individuals with suspect or outlier hourly wage rates are excluded. This consists of individuals with wages below 90% of the national minimum wage or above US\$150 (top 1%). Racial minorities are excluded because the lower wages of this cohort tends to complicate the analysis. Lastly, 55 working men and women are believed to be ineligible for SS. Such individuals received a federal, state or local government sponsored pension, but did not receive any SS benefits. These individuals are only included in a second model as a control group.

The functional form of model 1 is:

$$HOURS_{it} = \alpha + \beta X_{it} + \gamma DRC_t + \rho THRESHOLD_t + \varepsilon \tag{1}$$

*HOURS* reflects the annual hours of work, conditional on employment. *X* is a vector of independent variables described in Table 2. It is believed that  $\gamma$  and  $\rho$  will capture the impact of changes in the DRC and the real threshold, respectively. A time trend variable (*TREND*) is not included due to the shortness of the time horizon and the strong correlation between *AGE*, *DRC* and *TREND*.

It remains a possibility that unexplored factors outside the model are the primary cause of any observed change. To test for this hypothesis, a control group of individuals believed to be ineligible for SS are pooled with the test group. Model 2 takes on the form:

Table 3. Annual hours worked for men and women age 66 to 69 in the US, 1994–1999

Variables	Model 1/Men		Model 2/Men		Model 1/Women		Model 2/Women	
	DRC unadj.	DRC adj.	DRC unadj.	DRC adj.	DRC unadj.	DRC adj.	DRC unadj.	DRC adj.
<i>AGE</i>	21.3 (0.7)	21.0 (0.5)	22.1 (0.7)	21.8 (0.6)*	-33.6 (1.1)	-40.8 (1.1)	-30.9 (1.0)	-36.7 (1.0)
<i>DRC</i>	245.1 (2.2)*	244.7 (1.7)*	242.8 (2.2)*	242.5 (1.7)*	27.6 (0.3)	-2.2 (0.0)	45.2 (0.4)	21.0 (0.2)
<i>DRC(NO_SS)</i>	-	-	21.9 (0.1)	32.3 (0.1)	-	-	-20.2 (0.1)	-107.0 (0.2)
<i>ED11</i>	-41.0 (0.8)	-41.3 (0.8)	-44.5 (0.9)	-44.8 (0.9)	-46.2 (0.9)	-46.3 (0.9)	-48.8 (1.0)	-49.0 (1.0)
<i>ED13</i>	44.0 (0.9)	44.7 (0.9)	33.5 (0.7)	34.2 (0.7)	161.1 (3.6)*	160.8 (3.6)*	157.2 (3.5)*	156.6 (3.5)*
<i>ED16</i>	178.6 (3.2)*	178.8 (3.2)*	166.5 (3.0)*	166.7 (3.0)*	257.3 (4.3)*	257.3 (4.3)*	242.5 (4.0)*	242.7 (4.0)*
<i>ED17</i>	391.5 (6.9)*	392.4 (6.9)*	387.4 (6.9)*	388.3 (6.9)*	171.2 (2.3)*	171.8 (2.3)*	162.3 (2.2)*	162.3 (2.2)*
<i>HEALTH</i>	-323.0 (5.6)*	-322.2 (5.6)*	-324.9 (5.7)*	-324.2 (5.7)*	-413.0 (7.2)*	-413.1 (7.3)*	-413.8 (7.3)*	-413.7 (7.3)*
<i>LN_FY</i>	15.2 (1.5)	15.1 (1.5)	15.9 (1.6)	15.7 (1.6)	-1.6 (0.2)	-1.5 (0.2)	-0.9 (0.1)	-0.8 (0.1)
<i>LN_PY</i>	-49.0 (7.9)*	-49.0 (7.9)*	-49.0 (7.9)*	-49.0 (7.9)*	-26.9 (4.4)*	-27.0 (4.4)*	-27.3 (4.4)*	-27.4 (4.4)*
<i>MARRIED</i>	-93.8 (1.8)*	-93.4 (1.8)*	-95.5 (1.9)*	-95.0 (1.8)*	-287.1 (6.7)*	-287.3 (6.7)*	-292.8 (6.8)*	-293.0 (6.8)*
<i>METRO</i>	16.7 (0.4)	16.8 (0.5)	19.4 (0.5)	19.5 (0.5)	70.7 (2.0)*	71.0 (2.0)*	64.2 (1.8)*	64.5 (1.8)*
<i>NO_SS</i>	-	-	959.6 (0.7)	925.1 (0.7)	-	-	254.8 (0.1)	548.3 (0.3)
<i>STATEUER</i>	67.0 (3.4)*	67.3 (3.3)*	67.2 (3.4)*	67.4 (3.4)*	8.9 (0.5)	8.2 (0.4)	7.2 (0.4)	6.5 (0.3)
<i>THRESHOLD</i>	-7.6 (1.8)*	-7.5 (1.4)	-7.4 (1.8)*	-7.3 (1.4)	0.5 (0.1)	1.5 (0.3)	-0.5 (0.1)	0.4 (0.1)
<i>WAGE</i>	-26.2 (1.1)	-25.2 (1.0)	-26.5 (1.1)	-25.6 (1.1)	-84.8 (3.0)*	-84.7 (3.0)*	-79.2 (2.8)*	-79.0 (2.8)*
Number	2612	2612	2652	2652	1929	1929	1944	1944
Adj. R <sup>2</sup>	0.063	0.063	0.063	0.064	0.085	0.085	0.083	0.084
F statistic	10.3	10.2	9.5	9.6	10.4	10.4	9.3	9.5

Notes: t-values in parenthesis. \*Statistical significance at 10% level. Constant and 5 regional dummies not shown.

$$\begin{aligned}
 HOURS_{it} = & \alpha + \beta \mathbf{X}_{it} + \mu NO\_SS_{it} + \chi DRC(NO\_SS = 1)_{it} \\
 & + \gamma DRC(NO\_SS = 0)_{it} \\
 & + \rho THRESHOLD_t + \varepsilon
 \end{aligned} \tag{2}$$

$NO\_SS$  equals one if an individual is believed to be ineligible for SS. The coefficient  $\chi$  is not expected to be statistically different from zero because this group observed no changes. For men, a Chow test does not reject the hypothesis of no structural differences between the test and control groups at the 0.01 level.<sup>4</sup>

Results of the models are shown in Table 3. All models are statistically significant at the 0.001 level. The signs of the coefficients were generally as expected. Being in good health, having higher educational attainment levels, being single, and having lower sources of other personal income increased the expected amount of annual hours for both genders. For women, higher average hourly wage rates decreased the expected amount of hours worked, suggesting that the income effect dominates the substitution effect. Contrary to expectations, the coefficients for *STATEUER* are positive for men.

The lack of a labour supply responses to the 1990 rules changes among women may be explained by the tendency of women to work fewer hours at lower pay combined with the higher threshold that existed at the start of this paper's survey (1994). As such, the lack of a statistically significant response to changes in SS rules is not surprising.

For men, each US\$100 increase in *THRESHOLD* decreased hours by less than 8 per day, but the finding is not robust. The results are not inconsistent with GO and FR. Each 0.5 percentage point rise in the DRC that occurred every two years increased male labour supply by approximately 120 hours annually. This tentatively implies that elderly men behave in a more farsighted manner than previously realized, perhaps due to increases in life expectancy.

#### IV. CONCLUDING REMARKS

The objectives of this paper were to investigate how changes in the DRC and the threshold may have impacted the labour supply behaviour of individuals age 65 to 69. Additionally, the research hoped to gain insights on myopic and farsighted behavioural differences between men and women.

This paper makes a significant contribution to the literature by presenting evidence that men reacted in a farsighted manner to changes in the DRC in the 1990s. This suggests that men may behave less myopically than previously thought, perhaps due to increases in the average life expectancy. This paper found no statistically significant evidence that women altered their work hours to account for changes in SS rules.

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<sup>4</sup> The variables used to perform this test are identical to those used in Model 1. The test was not done for women due to an insufficient number of observations.

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