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DO INCOME TAXES AFFECT THE PROGRESSIVITY OF SOCIAL SECURITY?

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Introduction

Policymakers have designed Social Security to be a progressive retirement program that replaces a larger share of monthly earnings for low- and middle-income workers than for high earners. However, previous research has found that, although the Disability Insurance (DI) component of Social Security is very progressive, the Old-Age and Survivors Insurance (OASI) component may be less progressive than intended. One reason is that high earners tend to live longer than low earners. Since Social Security pays an annuity that lasts throughout retirement, it benefits high earners with greater longevity.

Social Security's progressivity may also be affected by federal income taxes paid by workers and retirees, but research to date has largely ignored this effect. This *brief* uses data on households from the *Health and Retirement Study* to examine the interaction between income taxes and Social Security contributions and benefits.

The discussion proceeds as follows. The first section describes factors that could affect the progressivity of the OASI component of Social Security. The second section introduces three ways in which the income tax system could impact progressivity: the treatment of employer contributions to Social Security; the Earned Income Tax Credit; and the taxation of Social Security benefits. The third section describes the data and methodology used to analyze households in three birth cohorts and presents the before- and after-tax results for the oldest cohort. The fourth section extends the analysis to the two later cohorts to assess whether the role of taxes changes over time. The conclusion is that the *net* impact of taxes on progressivity is modest, as large effects from the separate tax provisions mainly offset one another. Over time, however, the net impact of taxes appears to be growing more progressive as an increasing number of retirees are required to pay income taxes on their benefits under current law.

Social Security Benefits and Progressivity

The size of each worker's Social Security retirement check is based on his highest 35 years of wages, but his benefits are calculated using a strongly progressive formula that replaces a higher share of earnings for low-income workers. This benefit formula works as follows: benefits at the full retirement age for individuals who became eligible in 2011 are equal to:

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- 90 percent of the first $749 of average indexed monthly earnings (AIME), plus
- 32 percent of AIME between $749 and $4,517, plus
- 15 percent of AIME above $4,517.[1]

This formula produces substantial redistribution from high- to low-income workers, all else being equal.

Research that evaluates whether Social Security achieves its redistributive goal has a long history. The effect of longevity is one example.[2] Another example is the finding that people who enter the labor force later – presumably those with more education and higher incomes – make contributions for fewer years of their working lives than do less educated, low-income workers.[3] One factor largely ignored by previous research on progressivity is the potential impact of the income tax treatment of Social Security contributions and benefits.[4]

How Income Taxes Could Affect Progressivity

Income taxes could affect progressivity through three avenues: 1) employer contributions to Social Security; 2) the Earned Income Tax Credit; and 3) income taxation of Social Security benefits.

Workers and employers each contribute a portion of a worker's earnings to the Social Security program. The worker's contributions – which come directly out of his earnings – are subject to the personal income tax. In contrast, the employer's contributions – which effectively reduce a worker's earnings and transfer the money to Social Security on his behalf – are exempt from income taxes.[5] This transfer, which is invisible to most workers, indirectly reduces the worker's gross income that is subject to the income tax. Since high-income workers pay higher marginal tax rates, this "invisible deduction" from taxable income benefits them more. For example, for a high-income worker in the 35-percent tax bracket, each dollar in employer contributions effectively costs him only 65 cents ($1.00 - $0.35). For a middle-income worker in the 10-percent bracket, the employer contribution costs 90 cents ($1.00 – $0.10). Therefore, this tax provision has the effect of reducing Social Security's progressivity.

Second are the effects of the Earned Income Tax Credit (EITC). The EITC is progressive by design, generating refunds that go exclusively to low-income workers. Under IRS rules, the credit increases for each dollar of earnings up to a maximum level; maintains that maximum credit through an additional amount of earnings; and gradually phases it out as earnings continue to rise.[6] For workers whose earnings put them in the phase-in range of the credit, every dollar earned yields them a refund of $0.40; in short, they face a negative tax rate. This refund helps to offset a low-income employee's contributions to Social Security, thereby increasing progressivity. At the same time, though, a separate EITC effect *reduces* progressivity. Since EITC recipients face a negative tax rate, the exclusion of employer contributions to Social Security from their taxable earnings effectively reduces the size of their EITC refund. So the net impact of these disparate EITC effects on progressivity is ambiguous.

A third tax effect on progressivity is the income tax on Social Security benefits, which first took effect in 1984. Income taxes apply to only a portion of benefits, and a progressive formula determines the amount subject to tax (see Table 1). Households below certain income thresholds do not pay any taxes on their benefits.

The income thresholds have never been indexed for wage growth or inflation. As a result, more and more households over time have been pushed above the thresholds and either began paying taxes or paid taxes on more of their Social Security benefits. Currently, about 35 percent of retirees pay taxes on their benefits.[7] In 2010, total federal receipts from these taxes reached $22 billion – almost eight times the revenue raised in 1984.

Table 1. Percent of Social Security Benefits Subject to Income Taxation

Family type	"Combined income" limits	Percent
Individual	Less than $25,000	0
	$25,000-$34,000	50
	Above $34,000	85
Couple	Less than $32,000	0
	$32,000-$44,000	50
	Above $44,000	85

Note: "Combined income" is adjusted gross income as reported on tax forms plus nontaxable interest income plus one half of Social Security benefits.
Source: Committee on Ways and Means, U.S. House of Representatives (2000).

Methodology and Baseline Results

The objective of the analysis is to quantify how the three different income tax provisions affect Social Security's progressivity. The main data source used is the *Health and Retirement Study* (HRS), a nationally representative survey of older households.[8] The version of the HRS used here is linked with Social Security Earnings Records to estimate Social Security tax payments and retirement benefits for three cohorts of workers. The cohorts are the Original HRS cohort (born during the 1931-1941 period), and two later cohorts: the War Babies (1942-1947) and the Early Baby Boomers (1948-1953).

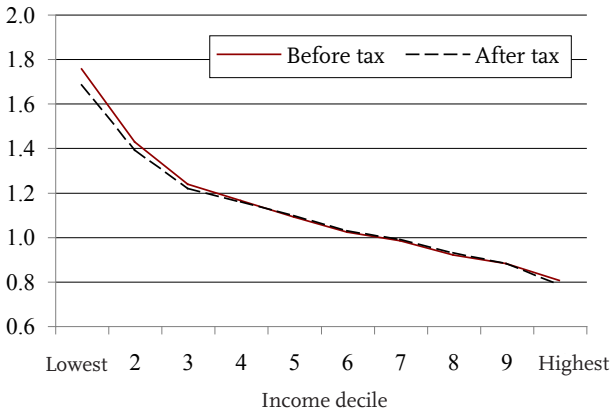
The analysis proceeds in three steps. The first step is to produce a baseline measure of redistribution for the Original HRS cohort, without the impact of the personal income tax. The next step is to insert taxes into this measure. Finally, as discussed in the following section, the later HRS cohorts are analyzed to determine whether the impact of taxes on redistribution has changed over time.

As the basis for the calculations, the analysis uses actual data on earnings histories from the HRS back to 1951 and then projects earnings going forward to each worker's expected retirement age.[9] Combining the actual earnings with the projected earnings yields a complete earnings profile for the members of each household in the sample. This earnings profile serves as a base for calculating Social Security taxes paid, based on the tax rates in place at the time the wages were earned. The earnings profile, combined with HRS data on marital status for each household, also allows for the calculation of Social Security retirement benefits, including benefits received by spouses and survivors. The tax and benefit streams are then converted into present discounted values.[10]

Armed with the results of the tax and benefit calculations, it is possible to examine the extent to which Social Security redistributes funds from the high- to low-income households in each cohort. The households are divided into income deciles, which are defined by their AIME.[11] Figure 1 presents the ratio of benefits to taxes for each income decile; the ratios are expressed relative to the average household in the cohort in order to focus solely on the redistribution *within* each cohort rather than redistribution *between* different cohorts. The solid line shows the baseline results, before tax effects are added. The lowest decile households have a ratio of 1.8 while the highest decile households have a ratio of 0.8. Clearly, those with lower incomes receive a bigger "bang for the buck" from Social Security than their high-income counterparts.

Next, income tax effects are added to the baseline measure. The dashed line in Figure 1 shows the results on progressivity. The *net* impact is minimal, as the after-tax ratios by decile look nearly identical to the before-tax ratios. This result is due to the offsetting effects of the different tax provisions analyzed. As expected, the "invisible" income tax deduction from employer contributions reduces the amount redistributed to low-income workers, but its impact is counteracted by the progressive influence of the taxation of Social Security benefits; the size of these separate effects is discussed in the following section. The EITC provision has almost no effect, as the progressive nature of the EITC refund is cancelled out by the effective reduction in the refund resulting from the exclusion of employer contributions from taxable income.

Figure 1. Ratio of Social Security Benefits to Payroll Taxes[a] for Original HRS Cohort, Before and After Income Tax Effects, By Income Decile



[a] The ratios presented here are expressed relative to the average household in the cohort.
Source: Authors' calculations using University of Michigan, *Health and Retirement Survey* (HRS) linked to U.S. Social Security Administration (SSA) earnings data.

Do the Tax Effects Change Over Time?

While income taxes have little *net* impact on progressivity for the Original HRS cohort, the analysis was extended to the War Babies and Early Baby Boomers

to see if the impact changes over time. One reason that a change could occur is that, as noted above, an increasing percentage of households are subject to income taxation on their Social Security benefits; the share of such households is rising by about 1 percentage point annually.[12]

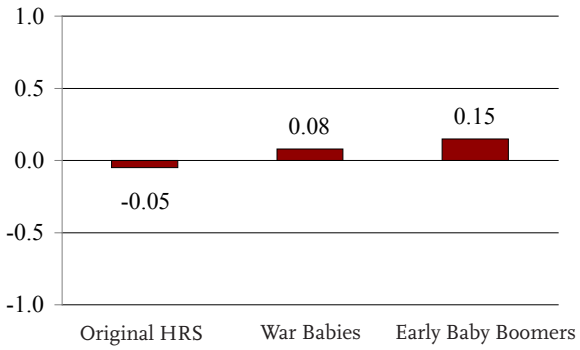
To compare the impact of taxes over time, it is necessary to start with an estimate of the net impact of taxes on progressivity for each cohort. One way to estimate this impact is to look at how much the lower and middle deciles combined – in this case, the bottom 60 percent of earners – receive in benefits relative to taxes.[13] In a neutral system with no progressivity, the bottom 60 percent of households would pay a share of total taxes equal to their share of total benefits. For the Original HRS cohort, before any effects from income taxes, the bottom 60 percent pay 40.64 percent of the taxes and receive 47.52 percent of the benefits. Therefore, the net amount of progressivity can be expressed as the percent of benefits that are redistributed, which is 6.88 percent (47.52 – 40.64).

Next, a similar net estimate is calculated for the effects of the income tax provisions. When taxes are included for the Original HRS cohort, the percentage of benefits redistributed declines slightly to 6.83 percent. In other words, tax effects reduce progressivity for this cohort by 0.05 percent of benefits.

Finally, the analysis is extended to the later cohorts. Figure 2 shows the comparable net effects of taxes for all three cohorts. While all of the changes are modest, a pattern does emerge of increased progressivity over time. For the War Babies, income taxes have a slightly positive effect on progressivity of 0.08 percent of benefits. And this effect is a bit larger for the Early Baby Boomers, at 0.15 percent of benefits.

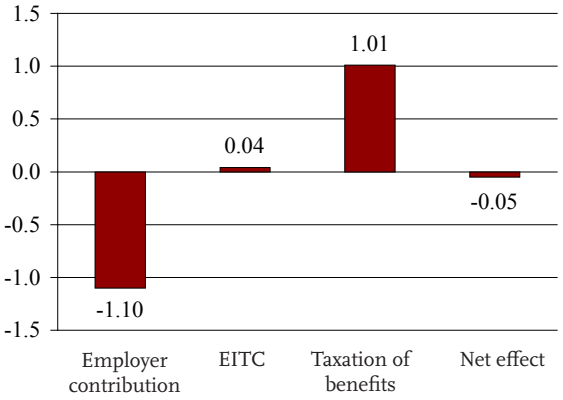
The modest *net* effect of taxes masks the underlying size of the effects of the individual tax provisions. Figure 3 shows the impact of each separate tax provision on progressivity for the Original HRS cohort. The employer contribution provision by itself reduces progressivity by about 1 percentage point – a significant change given that the baseline redistribution measure before taxes is about 7 percent. But it turns out that the benefit tax provision essentially cancels out this impact; by itself, it increases progressivity by about 1 percentage point.

Figure 2. Percentage-Point Change in Progressivity from Income Taxes, by Cohort



Source: Authors' calculations using the HRS linked to SSA administrative data.

Figure 3. Percentage-Point Change in Progressivity by Income Tax Provisions, Original HRS Cohort



Source: Authors' calculations using the HRS linked to SSA administrative data.

Conclusion

This *brief* found that, despite the tendency of higher earners to live longer and work fewer years, the OASI component of the Social Security program is clearly progressive. Households in the lowest earnings decile – relative to the average household in the cohort – receive nearly 80 percent more in benefits than they pay in taxes while earners in the highest decile receive less than they pay in. Adding the influence of income taxes has only a small *net* impact on the program's progressivity, as the large effects of specific tax provisions mainly offset one another. Net tax effects do, however, appear to add to progressivity over time due to the increasing percentage of households subject to income taxes on their Social Security benefits. With no changes in tax laws, this trend toward greater progressivity is likely to continue.

Endnotes

1 AIME is calculated by adjusting a worker's past earnings for growth in average wages over time. For those who claim their Social Security benefits before (after) the full retirement age, benefits are actuarially reduced (increased).

2 Harris and Sabelhaus (2005).

3 See Friedman (1972) or Aaron (1982).

4 One study – Goodman and Liebman (2008) – explored the interaction between income taxes and Social Security for prototypical families.

5 This analysis adopts a common assumption in the economics literature that the employer's Social Security contribution reduces the worker's wages by an equal amount. See, for example, Hammermesh and Rees (1993) or Piketty and Saez (2007).

6 The credit also varies depending on family size. For example, a worker with three children could claim a maximum credit of $5,751, with the credit phased out at an income level of $43,998.

7 Goss (2011).

8 For an overview of the HRS, see Juster and Suzman (1995).

9 Earnings histories are provided with the permission of the respondent. Approximately 70 percent of the sample has given permission. For two-earner couples, separate earnings histories are provided for each individual.

11 Such calculations require assumptions about mortality probabilities and discount rates. The mortality assumptions start with mortality tables from the Social Security Administration (SSA) and then are adjusted for variations in education and race based on the results of Brown, Liebman and Pollet (2002). The discount rate used is the 10-year U.S. government bond rate prior to 2010 and the SSA's intermediate interest rate projection after 2010.

11 For couples, household AIME is the sum of the AIME for both individuals. For divorced individuals whose marriage lasted longer than 10 years, household AIME is also the sum of the AIME for both individuals.

12 Goss (2011).

13 Starting with the seventh decile and going up through the tenth decile, the share of taxes paid by each decile exceeds the share of benefits received by the decile.

References

Aaron, Henry J. 1982. *Economic Effects of Social Security*. Washington, DC: Brookings Institution Press.

Brown, Jeffrey R., Jeffrey B. Liebman, and Joshua Pollet. 2002. "Estimating Life Tables that Reflect Socioeconomic Differences in Mortality." In *The Distributional Effects of Social Security and Social Security Reform*, edited by Martin Feldstein and Jeffrey B. Liebman, 447-457. Chicago, IL: University of Chicago Press.

Committee on Ways and Means, U.S. House of Representatives. 2000. *2000 Green Book*. Washington, DC: U.S. Government Printing Office.

Coe, Norma B., Zhenya Karamcheva, Richard Kopcke, and Alicia H. Munnell. 2011. "How Does the Personal Income Tax Affect the Progressivity of OASI Benefits?" Working Paper 2011-21. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Friedman, Milton. 1972. "Second Lecture." In *Social Security: Universal or Selective?*, edited by Wilbur J. Cohen and Milton Friedman, 21-49. Washington, DC: American Enterprise Institute.

Goodman, Sarena and Jeffrey B. Liebman. 2008. "The Taxation of Social Security Benefits as an Approach to Means Testing." Paper presented at the Annual Conference of the Retirement Research Consortium.

Goss, Stephen C. 2011. Personal communication.

Hamermesh, Daniel S. and Albert Rees. 1993. *The Economics of Work and Pay*. New York, NY: Harper Collins College Publishers.

Harris, Amy and John Sabelhaus. 2005. "How Does Differential Mortality Affect Social Security Finances and Redistribution?" Working Paper 2005-5. Washington, DC: Congressional Budget Office.

Juster, F. Thomas and Richard Suzman. 1995. "An Overview of the Health and Retirement Study." *Journal of Human Resources* 30(5): S7-S56.

Piketty, Thomas and Emmanuel Saez. 2007. "How Progressive is the U.S. Federal Tax System? A Historical and International Perspective." *Journal of Economic Perspectives* 21(1): 3-24.

University of Michigan. *Health and Retirement Study*, 1992-2008. Ann Arbor, MI.

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