



HOW MUCH TAXES WILL RETIREES OWE ON THEIR RETIREMENT INCOME?

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Abstract

To evaluate their retirement resources, households approaching retirement will examine their Social Security statements, defined benefit pensions, defined contribution balances, and other financial assets. However, many households may forget that not all of these resources belong to them; they will need to pay some portion to federal and state government in taxes. It is unclear, however, just how large the tax burden is for the typical retired household and for households with different income levels. This project aims to shed light on the tax burdens that retirees face by estimating lifetime taxes for a group of recently retired households. The project uses data from the *Health and Retirement Study* (HRS) linked to administrative earnings to determine Social Security benefits and administrative records on state of residence to estimate state tax liabilities. Income is then projected over the expected retirement of each household. Federal and state taxes, are estimated with TAXSIM, for each household on its reported and projected income.

The paper found that:

- These estimates show that households in the aggregate will have to pay about 6 percent of their income in federal and state income taxes.
- But this liability rests primarily with the top quintile of the income distribution.
- For the lowest four quintiles, taxes are negligible – ranging from 0 percent to 1.9 percent.
- In contrast, the average liability is 11.3 percent for the top quintile, 16.4 percent for the top 5 percent, and 22.7 percent for the top 1 percent.
- Interestingly, these percentages change very little across a variety of drawdown strategies.

The policy implications of the findings are:

- Taxes are meaningful for the top quintile, who are mostly married couples with average combined Social Security benefits of \$50,900, 401(k)/IRA balances of \$325,400 and financial wealth of \$441,400.
- If these retirement and financial assets were fully annuitized, the amount a household would receive is equivalent to about \$3,000 a month, and these households face tax liabilities of about 11 percent.

- Thus, for many households reliant on 401(k)/IRA or financial assets for security in retirement, taxes are an important consideration.

Introduction

To evaluate their retirement resources, households approaching retirement will examine their Social Security statements, defined benefit pensions, defined contribution balances, and other financial assets. However, many households may forget that not all of these resources belong to them; they will need to pay some portion to federal and state government in taxes. Roughly half of households owe federal taxes on their Social Security benefits. In addition, about two-thirds of households will have some income from employer-sponsored retirement plans, where they will face taxes on their defined benefit income or on withdrawals from any traditional tax-deferred defined contribution plan. In other words, when looking at their accumulated resources, households approaching retirement may think they have more saved up than they will actually have available. It is unclear, however, just how large the tax burden is for the typical retired household and for households with different income levels.

This project aims to shed light on the tax burdens that retirees face by estimating lifetime taxes for a group of recently retired households. The project uses data from the *Health and Retirement Study* (HRS) linked to administrative earnings to determine Social Security benefits and administrative records on state of residence to estimate state tax liabilities. Income is then projected over the expected retirement of each household. Federal and state taxes for each household on its reported and projected income are estimated with TAXSIM. The results relate the present discounted value of lifetime taxes at retirement to the present value of retirement resources for the average retired household and for households at different points in the income distribution.

These estimates show that households in the aggregate will have to pay about 6 percent of their income in federal and state income taxes. But this liability rests primarily with the top quintile of the income distribution. For the lowest four quintiles, taxes are negligible – ranging from 0 percent to 1.9 percent. In contrast, the average liability is 11.3 percent for the top quintile, 16.4 percent for the top 5 percent, and 22.7 percent for the top 1 percent. Thus, taxes are an important consideration for those relying on 401(k)/IRA and financial assets for retirement security. Interestingly, these percentages change very little across a variety of drawdown strategies.

The rest of the paper proceeds as follows. The next section describes the types of taxes that households face on their retirement resources. The third section summarizes the few studies

that address the issue of tax liability in retirement. The fourth section discusses the data and methodology, and the fifth section presents the results. The final section concludes that, on average, the tax burden is modest, but households in the top quintile owe the government a meaningful share of their accumulated assets.

Taxation of Retirement Income

Households face taxes on most components of their retirement income – benefits from Social Security, payouts from traditional employer-sponsored retirement plans, and capital gains taxes on any financial assets that they sell to support retirement consumption. The following discussion focuses on federal taxes for each source of income and closes with a brief analysis of state taxes.

Social Security Benefits

Social Security is the major source of income for most retired households, and many retirees may have to pay taxes on their benefits. Under current law, only individuals with less than \$25,000 and married couples with less than \$32,000 of modified adjusted gross income (AGI) do not have to pay taxes on their benefits. (“Modified AGI” is AGI as reported on tax forms plus nontaxable interest income, interest from foreign sources, and one-half of Social Security benefits.) Above those thresholds, recipients must pay taxes on up to either 50 percent or 85 percent of their benefits.

The taxation of benefits was introduced in the 1983 Amendments to the Social Security Act. The approach to taxing these benefits reflected the consensus at the time, from both the 1979 Advisory Council and the 1981-1982 National Commission on Social Security Reform (the “Greenspan Commission”), that the tax treatment of Social Security benefits should match that of private pensions. Under the rules for defined benefit pensions, workers are taxed on their benefits net of any after-tax contributions they made during their careers. Since only the nominal value of the worker’s contributions is netted out – with no adjustment for inflation or imputed interest – the netting process results in a very small tax savings. Social Security’s actuaries estimated that, for most beneficiaries, this approach would result in over 90 percent of benefits being taxed. To avoid overtaxing anyone, the share of Social Security benefits subject to taxation was set at 85 percent.

In 1983, Congress went only partway toward the recommendation that 85 percent of Social Security benefits be taxed. It limited the taxable share to 50 percent and phased in that target by establishing that households would be taxed only to the extent that their combined income exceeded \$25,000 for singles and \$32,000 for couples. Since these thresholds were not indexed for inflation or wage growth, it was clear that the share of households and of benefits subject to tax would increase over time.

Ten years later, the Omnibus Budget Reconciliation Act of 1993 increased the maximum share of Social Security benefits that could be subject to tax to 85 percent, with the increase applying only to single taxpayers with combined income above \$34,000 and to couples above \$44,000.¹ Again, these thresholds were not indexed for inflation. The result of the legislation is a quite complicated formula for determining the amount of Social Security benefits to include in AGI (see Table 1).

Initially, only a small percentage of beneficiaries paid taxes on their Social Security benefits. But as incomes rose over time, the percentage of households owing taxes increased sharply. By 2010, 47 percent of beneficiary households paid some taxes on their benefits, rising to about 55 percent today, and this share is ultimately projected to level off at 58 percent around 2030 (Purcell 2015).

Income from Employer-Sponsored Retirement Plans

Employers offer retirement benefits through either defined benefit plans or defined contribution plans, such as 401(k)s. And even though they are not sponsored by employers, Individual Retirement Accounts (IRAs) are also included in this discussion since their tax treatment is similar to that of 401(k)s and the bulk of IRA assets are rollovers from employer-sponsored plans (Chen and Munnell 2017).

The taxation of defined benefit pensions is straightforward. Beneficiaries simply include the amount of their combined monthly checks for the year in their AGI when filling out their federal tax returns. Since virtually all private sector plans are non-contributory, that is the end of the story. State and local defined benefit plans, on the other hand, are contributory. However, state and local employers generally “pick up” the employee’s contributions by decreasing the employee’s wages by the required contribution and depositing that amount in the plan. Thus, the

¹ The incremental revenue from the 1993 legislation was allocated to Medicare, not Social Security.

contribution is made on a pre-tax basis, and therefore no further adjustment is required when calculating the tax liability under the federal personal income tax.

The taxation of withdrawals from a defined contribution plan is more complicated, because the tax treatment depends on: 1) whether the plan is a traditional plan or a Roth; and 2) how the retiree decides to withdraw money from the account.

The saving done through traditional 401(k)s/IRAs is tax-advantaged in the same fashion as accumulations in a defined benefit plan. The employee contributes on a pre-tax basis, and the contributions and investment returns are taxed in full at retirement. Since 2006, however, employers also have had the option of offering a Roth 401(k), and individuals could open a Roth IRA. Under the Roth arrangement, initial contributions are put in the plan after income taxes have been paid, but investment earnings accrue tax free and no taxes are paid when the money is withdrawn in retirement.

In theory, if the tax rates that people face in retirement are the same as those when they are young, the tax treatment of traditional and Roth accounts is equivalent.² In a traditional account, with an annual return on the assets of r , \$1,000 contributed to a 401(k) would have grown to $\$1,000 (1+r)^n$ after n years. When individuals withdraw their accumulated funds, both the original contribution and the accumulated earnings are taxable, so the after-tax value of the 401(k) in retirement is $\$1,000 (1+r)^n (1-t)$. In a Roth 401(k)/IRA, individuals pay tax on the original contribution, so they put $(1-t) \$1000$ into the account. After n years, these after-tax proceeds would have grown to $(1-t) \$1,000 (1+r)^n$. Since the proceeds are not subject to any further tax, the after-tax amounts under the traditional and Roth plans are identical:

$$\begin{array}{cc} \text{Traditional} & \text{Roth} \\ \$1,000 (1+r)^n (1-t) & = (1-t) \$1,000 (1+r)^n \end{array}$$

Finally, given the decisive shift from defined benefit plans to defined contribution plans, and the

² In terms of legalities, the primary difference between the two types is that the Roth 401(k) allows for larger contributions. This factor is not obvious given that individuals can contribute \$19,500 (\$26,000 if age 50 or over) under either type of 401(k) plan and a maximum of \$6,000 to an IRA in 2020. But for the individual in, say, the 25-percent personal income tax bracket, a \$19,500 after-tax contribution is equivalent to \$26,000 before tax. Thus, in effect, the contribution limit is higher under the Roth 401(k). The same is true for IRAs.

additional tax complexity posed by the latter, Box 1 considers whether 85 percent is still the right target for taxing Social Security.³

Box 1. In a 401(k) World, Is 85 Percent Still the Right Target for Taxing Social Security Benefits?

In today's retirement plan environment, it is not clear that the goal of equating the tax on Social Security with that on private plans would lead to a target of taxing 85 percent of benefits. While it may have made sense to look to defined benefit plans to establish a benchmark in the 1980s, today most private sector workers are covered by 401(k) plans. As discussed, these plans can take the form of a traditional or a Roth. In the traditional case, the employee puts in pre-tax dollars and is taxed when the money is withdrawn in retirement. In the Roth case, the employee puts in after-tax dollars and pays no tax in retirement.

Social Security contributions can be thought of as one-half traditional and one-half Roth. The employer's share of the contribution is made on a pre-income-tax basis (since no income tax is charged on the employer payroll tax payments), and the employee's share is made on an after-income-tax basis (since the paycheck is subject to both the income tax and the payroll tax). From this perspective, taxing Social Security like private plans would suggest that the half of Social Security benefits financed by the employer's pre-tax contribution should be taxable in retirement and the Roth-like other half, where taxes have already been paid, should be excluded. In other words, today 50 percent – not 85 percent – of Social Security benefits might be viewed as the appropriate share of benefits to include in adjusted gross income.

Despite the equivalence of traditional and Roth plans, it is important to know which type of account is involved because we are not interested in lifetime tax burdens, but rather on the share of assets at the start of retirement that must be paid in taxes. Data from the Internal Revenue Service (IRS) and Vanguard (2020) show that roughly 10 percent of assets are held in Roth IRAs or Roth 401(k)s.

In addition to the type of plan, the pattern of taxes over the household's retirement years, and thereby the amount in terms of present discounted value, depends on how they decide to draw down their assets. Drawdown consists of both a mandatory and a voluntary component. Under current law, holders of 401(k)s and IRAs are required to withdraw a percentage of their account balances each year once they reach 72 (70½ for those who turned 70 prior to 2020). This Required Minimum Distribution (RMD) assures that these tax-favored saving accounts are used to provide income during retirement rather than to pass on wealth to heirs. The RMD is

³ Goss (1993) also provides a discussion.

calculated so as to spread balances over the participants' remaining lives. The penalty for failure to take an RMD is draconian – 50 percent of the amount that should have been withdrawn.

In terms of the voluntary component, we know very little about how households reliant on 401(k)s are going to draw down their assets. A few studies have evaluated the drawdown strategies of retirees, but those studies have tended to focus on an earlier generation that is not very reliant on defined contribution wealth (Love, Palumbo, and Smith 2009; Poterba, Venti, and Wise 2011a, 2011b).⁴ One more recent study based on Internal Revenue Service (IRS) data for IRAs showed that only 20 percent of holders withdraw funds before the RMD rules become binding (Mortenson, Schramm, and Whitten 2019). How people draw down their 401(k)/IRA accumulations after the RMD rules kick in remains an open question.

Taxation of Other Financial Assets

Although Social Security and retirement plans constitute the bulk of financial assets for most households, higher-income households also have some additional financial assets. Unlike assets in retirement plans, these financial assets are not subject to any IRS distribution requirement. One issue is simply the extent to which households are likely to tap these resources to support their consumption in retirement, as opposed to retain them as insurance against long-term care costs or to leave as a bequest.

The second issue is the nature of the assets. To the extent households hold their assets in cash, they incur no federal tax liability when they hold it or tap their holdings for consumption. On the other hand, if they hold stocks and bonds, they will pay tax on dividend and interest income. And if they want to sell stocks and bonds to support their consumption or buy an annuity, they will likely face federal capital gains taxes on these securities.

State Taxes

In general, state personal income taxes piggyback on federal taxes. That is, many states use federal adjusted gross income, federal taxable income, or federal taxes paid as a starting point for state income tax calculations. As a result, income for state tax purposes generally

⁴ Perhaps for this reason, withdrawal rates are often found to be quite low. For a review of the limited literature, see MacDonald et al. (2013).

begins with the taxable portion of Social Security benefits, payments from defined benefit plans, withdrawals from defined contribution plans, and any realized capital gains.

States may also make an adjustment for all or part of the federally taxed Social Security benefits. Thirty states and the District of Columbia fully exclude Social Security from the state personal income tax (see Table 2). Twelve states tax all or part of Social Security in a way that differs from federal taxation; one state (Utah) follows federal taxation of Social Security; and seven states do not have an income tax. In addition, some states may exempt benefits for their public employees from taxation.

In summary, given the myriad of ways in which retirement resources might be taxed, the potential liability could account for a significant share of retirement assets. Understanding the magnitude of this liability is important not only for individuals' assessment of their own retirement security but also for measuring trends in wealth over time and the impact of wealth on retirement decisions.

Previous Research

Although the notion of taking taxes into account when calculating retirement resources appears obvious, most empirical work on retirement decisions includes a value of retirement wealth before taxes. Moreover, only a handful of papers have addressed the impact of taxes on retirement income or wealth.

Poterba (2004) explores the relationship between the amount of retirement consumption that could be supported by a dollar held in a tax-deferred account, such as a 401(k), and a dollar held in a taxable account. Based on estimates about the age distribution of tax-deferred account holders, the mix of debt and equity in the accounts, and the marginal tax rates of the holders in the late 1990s, he concluded that the deferred taxes on these accounts exceeded the value of future inside buildup. That is, the household sector would need a smaller stock of taxable assets outside tax-deferred accounts to deliver the same resources at retirement as the current stock of 401(k)-type assets. While the conclusion is sensitive to the income level of the investor, the time horizon, and the tax treatment of interest and dividends outside of retirement plans, the study emphasizes the importance of considering taxes when evaluating retirement resources.

Two studies by Edward Wolff also consider taxes when evaluating retirement resources. In the first analysis (2011), Wolff looks at the transformation of the retirement system from one

mainly reliant on defined benefit plans to a 401(k) world. The study uses the Federal Reserve's *Survey of Consumer Finances* (SCF) and covers 1983-2007. The analysis looks at the impact of the retirement plan shift on coverage, the value of retirement wealth, and the inequality in the distribution of wealth. The results show that pre-tax wealth, including defined contribution plans, defined benefit plans, and Social Security, became more unequal over the period. After-tax wealth grew more slowly over this period than pre-tax wealth but the difference was relatively small and did not affect the trend in inequality.

The second Wolff study (2020) builds on his earlier work, but broadens the focus to how taxes affect the distribution of wealth over time. The analysis relies on the SCF over the period 1983-2016, and concentrates on older households, who have started to save for retirement and accumulated meaningful wealth. Most relevant for this paper are his findings regarding "augmented" wealth, which includes traditional net worth plus defined benefit, defined contribution, and Social Security wealth. Over time, on a pre-tax basis, the distribution of both net worth and augmented wealth has become more unequal. Netting out taxes lowered defined benefit and defined contribution wealth by 24 percent, Social Security wealth by 14 percent, net worth by 5 percent, and augmented wealth by 8 percent in 2016. Subtracting taxes reduced retirement wealth inequality but had no impact on inequality for net worth or augmented wealth. The study also included an analysis of "bequest" wealth, including death benefits, before and after both income and estate taxes.

Looney and Moore (2015) perform a similar analysis, using the SCF for 1989-2013. They limit their analysis to household net worth, and do not consider Wolff's concept of augmented wealth, which includes the wealth from defined benefits plans and Social Security. Their tax analysis is based on current household income, but also includes imputed capital gains taxes on accrued capital gains. Their results, however, are quite similar to Wolff (2011) in that they find almost no difference in the growth rate of mean after-tax net worth compared to mean before-tax net worth – both gained about 60 percent from 1989 to 2013. They also report little effect of moving from a pre-tax to an after-tax basis on measured net worth inequality.

In addition to the wealth studies, Purcell (2015) takes a detailed look at the taxation of Social Security benefits. He uses Social Security's microsimulation model, Modeling Income in the Near Term (MINT), to project the proportion of beneficiary families that will owe federal income taxes and the proportion of benefit income they will owe in selected years from 2015 to

2050. The results show that, by 2050, 56 percent of families will owe federal income tax on part of their benefits and the median amount of benefit income owed will rise to 5 percent. Purcell also makes the important point that projecting taxes over time requires assumptions about future tax policy. MINT assumes that the tax provisions that currently stipulate the use of price indexing to adjust the tax-bracket thresholds will change to require wage indexing. If that does not happen, the ultimate estimates of households affected and the tax levy would be higher.

Our current paper adds to the modest literature on taxation of retirement income by examining the taxes imposed on the reported and projected streams of income for retired households, looking beyond Social Security to include taxes on income from employer-sponsored plans and capital gains taxes on assets sold to support consumption in retirement.

Data and Methodology

The analysis in this paper is based on income data from the *Health and Retirement Study* (HRS), a nationally representative longitudinal survey of older Americans. The project focuses on recently retired households – specifically, households where at least one earner has claimed Social Security benefits from 2010 to 2018. This construct produces a sample of 3,852 individuals and 2,173 households.⁵ Households where the primary earner received benefits before age 62 are disability conversions and therefore excluded. Similarly, households with no earnings records are also excluded. The final sample includes 3,419 individuals and 1,907 households.

Table 3 shows the marital status and financial resources of the sample households at the time of retirement. The information is provided by lifetime income quintile, where income is measured as the total Average Indexed Monthly Earnings (AIME) for the household.⁶

To get accurate estimates of Social Security benefits, the data are linked to administrative summary earnings records in the Master Earnings File; to get estimates of state taxes, the data are also linked to restricted information on state of residence.⁷ TAXSIM is used to estimate the amount households will owe in federal and state taxes.

⁵ For simplicity, a household is deemed retired if at least one spouse has claimed benefits.

⁶ AIME involves adjusting nominal earnings for each year up to age 60 by Social Security's Average Wage Index, identifying the highest 35 years (which can include unindexed wages earned after age 60), and dividing by 12 to produce a monthly figure.

⁷ Observed earnings are used to calculate each individual's highest 35 years.

The first step in estimating tax liabilities is to identify the income streams that the sample households will have available in retirement from: 1) Social Security; 2) employer-sponsored retirement plans; and 3) financial wealth.

Social Security Income

Social Security benefits, the largest source of income for many retirees, depend on two factors – earnings history and claiming age. The earnings history for this analysis comes from the administrative earnings records in the Master Earnings File. For respondents who did not agree to linkages with administrative earnings records, self-reported benefits are used.

The claiming age is based on the actual age and year that the primary earner claimed benefits. For households where only one member has claimed as of the last observation, it is assumed that the spouse claims at the same time as the retired spouse. However, in some instances, spouses are below the early eligibility age when their spouse claims; in these scenarios, it is assumed that the spouse claims at the average age at which others in their lifetime earnings quintile claim.

With earnings history and claiming age in hand, determining the annual benefits involves three steps: 1) calculating each worker's AIME; 2) applying the Social Security benefit formula to the AIME to determine their Primary Insurance Amount (PIA); and 3) adjusting the PIA through reductions for early claiming or credits for delayed retirement. Spousal benefits are incorporated based on the relative earnings of the two spouses. Benefits are adjusted annually in line with changes in the cost-of-living, with COLAs for future years based on projections from the *2020 Social Security Trustees Report*.

Income from Employer-Sponsored Retirement Plans

This analysis depends on whether the plan is defined benefit or defined contribution.

Defined Benefit. For households with defined benefit plans, annual pension income is based on self-reported estimates. In 2012, the HRS revalidated prior information provided on retirement plans for each respondent, which helped to ensure more accurate responses.⁸

⁸ The HRS also provides employer-produced descriptions of the pension formulas governing benefits; Gustman, Steinmeier, and Tabatabai's (2010) comparison of self-reported and employer-reported plan benefits reveals substantial misreporting at the individual level but little evidence of systematic biases in aggregate.

Defined Contribution. For households with assets in defined contribution plans, the issue, as noted above, is more complicated because the tax burden depends on whether the contributions were made pre-tax (traditional) or post-tax (Roth) and on the pattern of withdrawal.

While the HRS does not distinguish between traditional and Roth 401(k)s/IRAs, the *Survey of Consumer Finances* provides information on the percentage of IRA assets held in a Roth account. Table 4 presents the data by income quintile for households with heads ages 62+. The average across all quintiles is 9 percent, which seems in line with IRS data showing 10 percent of IRA holdings in Roths for the population as a whole. On the 401(k) front, Vanguard provides data on the percentage of 401(k) assets in Roths, and this number also turns out to be 10 percent. To incorporate the Roth information into the current analysis, HRS households are sorted into income quintiles, and the SCF percentages are applied to both their IRA and 401(k) holdings.

In terms of drawdown, since the pattern is unclear, we estimate taxes based on several alternatives. Our base case assumes that households withdraw nothing from their 401(k)s and IRAs until age 70½ (or 72 for individuals who turn 70 after 2020) and then draw down their assets at the rate dictated by the required minimum distribution (RMD) rules. In addition to the base case, we consider two alternatives. Under one option, households before the applicable RMD age withdraw at a rate implied by the RMD rules and then follow the RMD rules once they become binding.⁹ Under the other option, households use their 401(k)/IRA balances at the claiming age to purchase an immediate annuity, with joint-and-survivor benefits for married couples.

The first two drawdown alternatives require assumptions about the returns of untapped assets. The balances in both 401(k)s and IRAs are assumed to be allocated across asset classes based on that of retired households in a typical Target Date Fund, and assets are assumed to earn the average gross real return for each asset class for the period 1970-2016 (Ibbotson 2017). The allocation of assets and returns by asset class are shown in Table 5. The third drawdown option assumed market annuity rates as of June 20, 2020 (from immediateannuities.com) and, for simplicity, assumed that the wife in a married household is three years younger than the husband.

⁹ Implied RMDs for ages before 70½ (72 after 2020) are calculated by taking the inverse of the average life expectancy provided by the Internal Revenue Service (2019).

Financial Assets

While most households' retirement resources consist mainly of Social Security benefits, income from defined benefit plans, and/or 401(k)/IRA assets, some households in the top two income quintiles also hold financial assets outside of these retirement arrangements. Our baseline assumption is that these households use only the interest and dividends from these assets to support their consumption, leaving the rest as a bequest. Interest and dividend payout rates are assumed to stay constant throughout retirement, and the returns on untapped stock and bond assets are estimated to equal the average gross return for the respective asset class between 1970-2016, as shown in Table 5.

The other option considered is that households use half of their financial assets to buy a joint-and-survivor annuity at the time they claim their Social Security benefits. This purchase requires selling financial assets, and the tax liability on the sale will depend on the gain or loss in the market value since the assets were acquired. While the HRS does not provide information on the total gain/loss in market value, the SCF does ask people a series of questions to get at the magnitude of their capital gains.¹⁰ The average of responses for those ages 62+ was 236 percent, which suggests that of \$1 million in current holdings, the original investment was about \$300,000 and the capital gain \$700,000. This SCF percentage gain is applied to stock accounts liquidated to purchase an annuity.

Calculation of Taxes in Retirement

Once these income streams are identified, the next step is to calculate the annual tax burden for each household. The plan is to use the NBER's TAXSIM 32 program to derive federal and state taxes for Social Security, employer-sponsored plans, and financial wealth.

TAXSIM 32 reflects the current law in each year and incorporates provisions from the Tax Cuts and Jobs Act of 2017 (TCJA), including the Affordable Care Act (ACA) taxes on earned and unearned income (but not the penalties for lacking health insurance), up through

¹⁰ The SCF asks the following questions: Overall has there been a gain or loss in the value of your family's stock since you or someone in your family obtained it? How much has it gained in value since it was obtained? (Percent) How much has it gained in value since it was obtained? (\$Amount) How much has it lost in value since it was obtained? (Percent) How much has it lost in value since it was obtained? (\$Amount)

2023. For state taxes, TAXSIM32 incorporates state tax laws through 2019, and for years after 2019 assumes the "real" value of the 2019 law.

The TCJA, which made substantial changes to the tax code, contains an expiration date of December 31, 2025 for many of its provisions, in order to comply with certain budgetary constraints. Although the expiration would affect the tax rates, tax brackets, standard deduction, limits on deduction for state and local taxes, and many other provisions, we assume that the provisions remain in place for the lifetime of the household.

Tax calculations are performed each year for each household between age 62 and its quintile-related life expectancy, as recently calculated by SSA researchers (see Figure 1).¹¹ The final step is to calculate taxes as a percentage of pre-tax income, discounted back to the Social Security claiming age. To convert these amounts into present discounted values, we assume the real interest rate from the *2020 Social Security Trustees Report* of 2 percent. The tax rates are calculated overall and for groups defined by the household's AIME quintile.¹²

The ratio of households' taxes to pre-tax retirement resources provides an indication of how taxes affect resources in retirement and how these differ by AIME quintile and withdrawal pattern.

Results

The results, shown in Tables 6-9, summarize tax rates (the presented discounted value of retirement taxes as a percentage of the present discounted value of retirement income) by AIME quintile – and for the top 5 percent and 1 percent – for households overall and for married couples and single households. The results are arranged in order of the share of resources withdrawn over the period of retirement. The intuition is that, under a progressive structure, effective tax rates should rise as the level of income increases. That is, scenarios that assume higher levels of withdrawals should result in higher tax rates.

The base case, which involves minimal withdrawals from non-Social Security resources (taking only RMDs and living off the interest and dividends on financial assets), shows that

¹¹ Interest rates are based on the ultimate assumed rates from the *2020 Social Security Trustees Report*. Bosley, Morris, and Glenn (2018) provide estimates of mortality by AIME. Although taxes on housing are based on wealth, this calculation does require housing income to be converted to a flow. For this purpose, the project uses the concept of imputed rent for the home.

¹² For married couples, the estimates will simply be the sum of each member's AIME.

households in the aggregate will pay roughly 6 percent of their income in federal and state income taxes (see Table 6).¹³ The rate varies sharply by AIME quintile. Those in the bottom three quintiles pay close to zero, but the rate rises to 1.9 percent for the fourth quintile and to 11.3 percent for the top quintile, 16.4 percent for the top 5 percent, and 22.7 percent for the top 1 percent. The rates also vary by household type; for the highest quintile, they range from 10.7 percent for married couples to 17.3 percent for single individuals.

The next three sets of results gradually increase the amount withdrawn. Table 7 assumes people make 401(k) withdrawals in line with an imputed RMD before age 70½ (or 72) but continue to live off the interest and dividends from their other financial wealth. Table 8 assumes again that people take money out of their 401(k) early, but this time they also use 50 percent of their financial wealth to purchase a joint-and-survivor annuity. The final scenario (Table 9) assumes full annuitization of 401(k) balances as well as 50-percent annuitization of other financial wealth.

One important pattern emerging from these results is that, regardless of the drawdown strategy, households in the bottom three AIME quintiles most likely pay zero taxes in retirement. This percentage rises to only between 2 to 3 percent for the fourth quintile. In terms of financial security in retirement, this finding is good news – most households are not dramatically underestimating the resources available in retirement by not considering taxes.

Comparing the final scenario with the base case shows that, in a system with progressive rates, the retirement taxes are higher when a greater portion of retirement assets are withdrawn for consumption. The rate difference would be even greater except that the capital gains on financial assets, used to purchase an annuity, are taxed at much lower rates than ordinary income, and then only a small portion of the annuity purchased with after-tax income is subjected to taxation.¹⁴

Taxes, however, are meaningful for the top quintile, so it is important to consider the economic circumstances of these households. They are mostly married couples with average

¹³ This percentage is very close to the tax on wealth found by Wolff (2020).

¹⁴ Under the TCJA, short-term capital gains are taxed as ordinary income at rates up to 37 percent, while long-term gains (asset held for more than one year) are taxed at lower rates, up to 20 percent. Taxpayers with modified adjusted gross income above certain amounts are subject to an additional 3.8-percent net investment income tax on long- and short-term capital gains.

combined Social Security benefits of \$50,900, 401(k)/IRA balances of \$325,400 and financial wealth of \$441,400 (see Table 3). If these retirement and financial assets were fully annuitized, the amount a household would receive is equivalent to about \$3,000 a month. These households as a group are not what many would consider wealthy.

The fact that they constitute the highest quintile highlights the fact that most households do not have a lot of money in retirement. Yet, they will pay about 11 percent (or 12-13 percent for other drawdown scenarios) of their retirement income in taxes. Given that, without considering taxes, about 40 percent of households in the top third of the income distribution are at risk of not being able to maintain their standard of living, taxes will make the goal even more difficult to attain.¹⁵

Those in the top 5 percent and 1 percent of the AIME distribution hold more wealth both inside and outside of retirement plans. But even here, the reported average 401(k)/IRA holdings of \$497,500 and \$661,600, respectively, must look quite similar to what many academics hold in their TIAA accounts. For these groups, taxes amount to 16 percent and 23 percent of retirement income in our base case, respectively. Thus, taxes are an important consideration for those who hold meaningful balances and should be considered in their financial planning.

The final observation is that the drawdown strategy does not appear to have much impact on tax liability. For those in the top quintile effective taxes range from 11.3 to 12.8 percent. Those in the top 5 and top 1 percent are subject to a 16.4 to 17.9 percent or 22.7 to 25 percent tax rate, respectively, depending on drawdown strategy. That outcome may reflect simplifying assumptions underlying the analysis. But it also raises questions about how much attention people need to devote to taxes as they consider different drawdown strategies.

Conclusion

As households approaching retirement examine their Social Security statements, defined benefit pensions, defined contribution balances, and other financial assets, they may forget that not all these resources belong to them. This paper attempts to shed some light on just how large the tax burden is for the typical retired household and for those with different income levels.

The results, show the tax burden on retirement income is negligible for the vast majority of households. Taxes as a percentage of retirement income in the first four quintiles range from

¹⁵ Munnell, Hou, and Sanzenbacher (2018)

0 percent to 1.9 percent. Serious tax liabilities arise only in the top quintile. Households in the top quintile in this sample of recent retirees from the *Health and Retirement Study* hold 401(k)/IRA balances of \$325,400 and financial wealth of \$441,400. If fully annuitized, this is equivalent to about \$3,000 a month and these households face tax liabilities of about 11 percent. Thus, for many households reliant on 401(k)/IRA or financial assets for security in retirement, taxes are an important consideration.

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Table 1. *Calculation of Taxable Social Security Benefits*

Modified AGI thresholds		Taxable portion
<i>Individual</i>		
A	Less than \$25,000	None
B	\$25,000-\$34,000	Lesser of: (1) 50% of benefits or (2) 50% of modified income above \$25,000 (maximum of \$4,500)
C	Above \$34,000	Lesser of: (1) 85% of benefits or (2) 85% of modified income above \$34,000 plus amount from line B
<i>Married filing jointly</i>		
D	Less than \$32,000	None
E	\$32,000-\$44,000	Lesser of: (1) 50% of benefits or (2) 50% of modified income above \$32,000 (maximum of \$6,000)
F	Above \$44,000	Lesser of: (1) 85% of benefits or (2) 85% of modified income above \$44,000 plus amount from line E

^a Modified AGI is AGI plus certain income exclusions plus 50% of Social Security benefits.

Source: Congressional Research Service (2020).

Table 2. *State Income Taxation of Social Security Benefits, 2020*

Tax treatment	States
Exempt from income taxes	Alabama, Arizona, Arkansas, California, Delaware, District of Columbia, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Virginia, Wisconsin
Subject to state income tax, with deductions	Colorado, Connecticut, Kansas, Minnesota, Missouri, Montana, Nebraska, New Mexico, North Dakota, Rhode Island, Vermont, West Virginia
Subject to income tax	Utah
No income tax	Alaska, Florida, Nevada, South Dakota, Texas, Washington, Wyoming

Source: Congressional Research Service (2020).

Table 3. *Marital Status and Average Retirement Resources in Year of Retirement in 2018 Dollars, by AIME Quintile*

Quintile	Percentage Married	Social Security	DB Pensions	DC Balances	Financial Wealth
Lowest	35.5%	\$11,035	\$2,512	\$19,194	\$30,557
Second	60.3%	\$29,178	\$4,390	\$60,583	\$74,205
Middle	75.7%	\$34,445	\$8,045	\$87,965	\$98,191
Fourth	82.7%	\$39,784	\$9,697	\$159,584	\$194,223
Highest	82.2%	\$50,882	\$25,879	\$325,365	\$441,393
Top 5%	81.8%	\$56,726	\$32,248	\$497,450	\$455,616
Top 1%	86.2%	\$60,702	\$33,152	\$661,626	\$1,632,274

Source: Authors' calculations from University of Michigan, *Health and Retirement Study*.

Table 4. *Percentage of Defined Contribution Plan Assets in Roth Accounts, by AIME Quintile*

AIME quintile	IRAs		401(k)s Vanguard
	SCF (Age 62+)	IRS (All ages)	(All ages)*
Lowest	3%		
Second	8		
Middle	6		
Fourth	11		
Highest	11		
Total	9%	10%	11%

* Percentage of participants contributing to Roth accounts.

Note: SCF data are from 2016 while IRS and Vanguard data are from 2018 and 2019 respectively.

Source: Authors' calculations using U.S. Board of Governors of the Federal Reserve System, *Survey of Consumer Finances* (2016); Internal Revenue Service (2019); and Vanguard (2020).

Table 5. *Assumed Asset Allocation and Returns for Assets in Defined Contribution Plans*

Asset type	Allocation	Returns
U.S. equities	33%	6.3%
International equities	24	9.0
U.S. corporate bonds	16	4.6
Long-term government bonds	14	4.4
U.S. Treasury Bill inflation adjusted	12	0.8
Weighted-average		5.7

Sources: Vanguard (2020); and authors' calculations from Ibbotson (2017).

Table 6. *Retirement Taxes as a Percentage of Retirement Income, Households Follow RMD and Consume Only Interest and Dividends from Financial Assets, by AMIE Quintile and Marital Status*

Quintile	All	Single	Married
Lowest	0.0%	0.0%	0.0%
Second	0.0	0.2	0.0
Middle	0.2	2.1	0.1
Fourth	1.9	7.7	1.1
Highest	11.3	17.3	10.7
Top 5%	16.4	24.8	15.8
Top 1%	22.7	*	*
All	5.7	7.2	5.5

*Tax rates for the top 1 percent of households could not be broken down by marital status due to disclosure agreements.

Source: Authors' calculations.

Table 7. *Retirement Taxes as a Percentage of Retirement Income, Households Follow Imputed RMD and Consume Only Interest/Dividends from Financial Assets, by AMIE Quintile and Marital Status*

Quintile	All	Single	Married
Lowest	0.0%	0.0%	0.0%
Second	0.0	0.2	0.0
Middle	0.2	2.2	0.1
Fourth	2.2	8.1	1.3
Highest	12.5	18.0	11.9
Top 5%	18.1	24.9	17.7
Top 1%	25.0	*	*
All	6.5	7.8	6.3

*Tax rates for the top 1 percent of households could not be broken down by marital status due to disclosure agreements.

Source: Authors' calculations.

Table 8. *Retirement Taxes as a Percentage of Retirement Income, Households Follow Imputed RMD and Annuitize 50 Percent of Financial Assets, by AMIE Quintile and Marital Status*

Quintile	All	Single	Married
Lowest	0.0%	0.0%	0.0%
Second	0.2	0.5	0.0
Middle	0.5	2.5	0.3
Fourth	2.7	7.5	2.1
Highest	11.9	17.9	11.2
Top 5%	17.0	25.3	16.4
Top 1%	22.7	*	*
All	6.3	7.7	6.1

*Tax rates for the top 1 percent of households could not be broken down by marital status due to disclosure agreements.

Source: Authors' calculations.

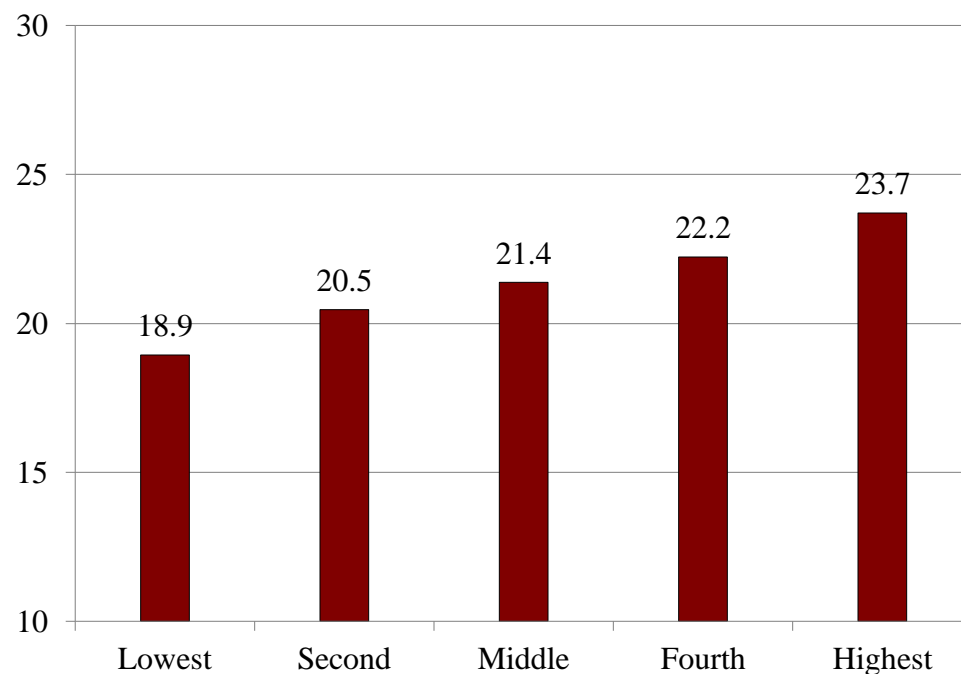
Table 9. Retirement Taxes as a Percentage of Retirement Income, Households Annuitize All DC Assets and 50 Percent of Financial Assets, by AMIE Quintile and Marital Status

Quintile	All	Single	Married
Lowest	0.0%	0.0%	0.0%
Second	0.1	0.4	0.0
Middle	0.4	3.3	0.1
Fourth	2.1	8.0	1.3
Highest	12.8	18.5	12.1
Top 5%	17.9	25.8	17.3
Top 1%	22.6	*	*
All	6.7	8.4	6.4

*Tax rates for the top 1 percent of households could not be broken down by marital status due to disclosure agreements.

Source: Authors' calculations.

Figure 1. Estimated Life Expectancy at Age 62, 2018



Note: Estimates assume a linear mortality trend for years without data and that mortality rates remain constant after age 80, the last age of available data.

Source: Authors' calculations from Bosley, Morris, and Glenn (2018).

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