



How Would 401(k) 'Rothification' Alter Saving, Retirement Security, and Inequality?

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Most United States 401(k) retirement accounts are taxed under an "EET" regime: Contributions come from pretax ("exempt") earnings, account investment earnings are "exempt" from tax, and income tax is then levied on account withdrawals ("taxed"). Since this policy has a large current budgetary cost — the U.S. Treasury foregoes more than \$100 billion per year due to such tax-deferred contributions — some policymakers have espoused eliminating or capping tax-qualified retirement plan contributions, a practice called "Rothification" after Senator William Roth who successfully passed legislation allowing this in 1997. Specifically, the idea is to treat all future retirement plan contributions to a "TEE" regime, in which workers contribute

after-tax income to their pensions and no additional tax would be levied thereafter.

Our research explores how Rothification might influence household consumption, saving, retirement patterns, and tax-payments, using a richly detailed and state-of-the-art life-cycle stochastic dynamic model with endogenous work effort, portfolio choice, consumption, saving, and Social Security claiming patterns. We also evaluate how outcomes will vary for workers with different lifetime earnings profiles (proxied by worker-types differentiated by sex and education). Last, we assess what changes if the economy moved away from the current low interest rate ($r = 1\%$) environment and returned to a more "normal" ($r = 3\%$) regime. We find

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that taxing pension contributions instead of withdrawals leads to delayed retirement, lower lifetime tax payments, reductions in consumption, and higher wealth and consumption inequality. Retirement asset accumulation is also lower under the Rothification regime.

Our modeling approach

Our structural life cycle-model first assumes an EET framework calibrated to U.S. federal/state income tax, Social Security/Medicare premium structures, and realistic Social Security benefit formulas, including adjustments for early and delayed claiming. This model also incorporates real-world rules characterizing EET tax-qualified 401(k) accounts, including current caps on 401(k) pretax contributions, employer matches, penalties and taxes on early withdrawals, and required minimum distribution withdrawals.

Investments may be made in risky stocks or riskless bonds in and outside the of 401(k) retirement accounts. Next, we evaluate in detail how switching from traditional EET to a TEE tax regime for retirement savings would affect claiming ages, assets held inside/outside tax-qualified retirement plans, consumption, work hours, asset and consumption inequality, and tax payments over the life cycle. We calibrate and solve the model for six subgroups of the overall population differentiated by education (less than high school, high school, college+) and sex (women/men). The interested reader is referred to our working paper for technical details of model calibration and detailed simulation results.

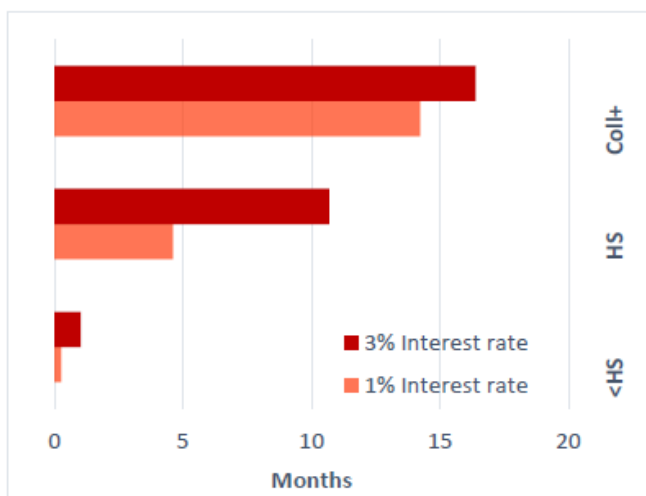
What would Rothification do?

Savings, consumption, and work effort

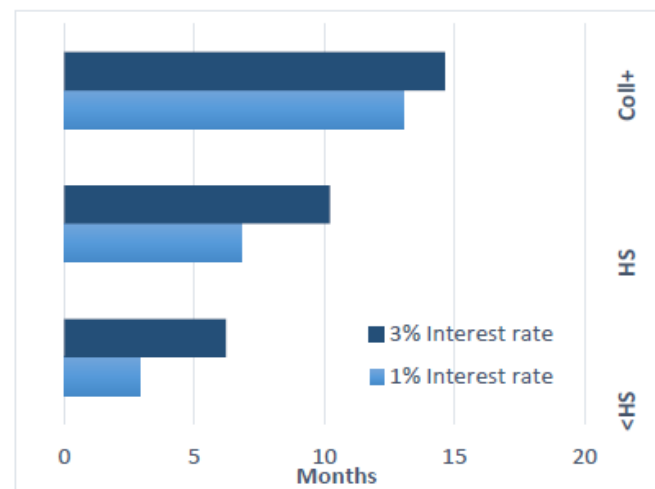
Under the TEE regime, 401(k) assets are lower, particu-

Figure 1: Average Claiming Age Differences by Education: TEE (Roth) versus EET Tax Regimes, and Low versus High Return Scenarios

A: Women



B: Men



Notes: We report the average claiming age difference for EET versus TEE for $r=1\%$ and 3% by sex and education groups $<HS$, HS , $+Coll$, derived from 100,000 simulated life cycles based on optimal feedback controls from the life-cycle model. Preference parameters are as follows: risk aversion $\rho=5$; time preference $\beta=0.96$; leisure preference $\alpha = 1.2$. The endogenous retirement age is between ages 62 to 70. The assumed risk premium for stock returns is 5% and return volatility 18%. Tax brackets are based on 2018 regulations (as described in the working paper's Appendix B). **Source:** Authors' calculations.

larly in later life, compared to the EET regime. By contrast, non-401(k) assets are markedly lower in the EET world from age 60 onward, by about half as of the full retirement age (i.e., age 66). Yet the value of retirement plan assets in the EET regime is not directly comparable with that in the TEE regime because withdrawals of EET assets must be taxed before they can be used for consumption, while withdrawals from TEE assets are tax free. Rothification also prompts workers to curtail their lifetime work hours, compared to the current EET regime. The TEE regime's lower marginal tax rate on 401(k) payouts also induces workers to defer Social Security claiming more than under the EET regime. Moreover, this effect is stronger under a high- versus a low-interest rate regime.

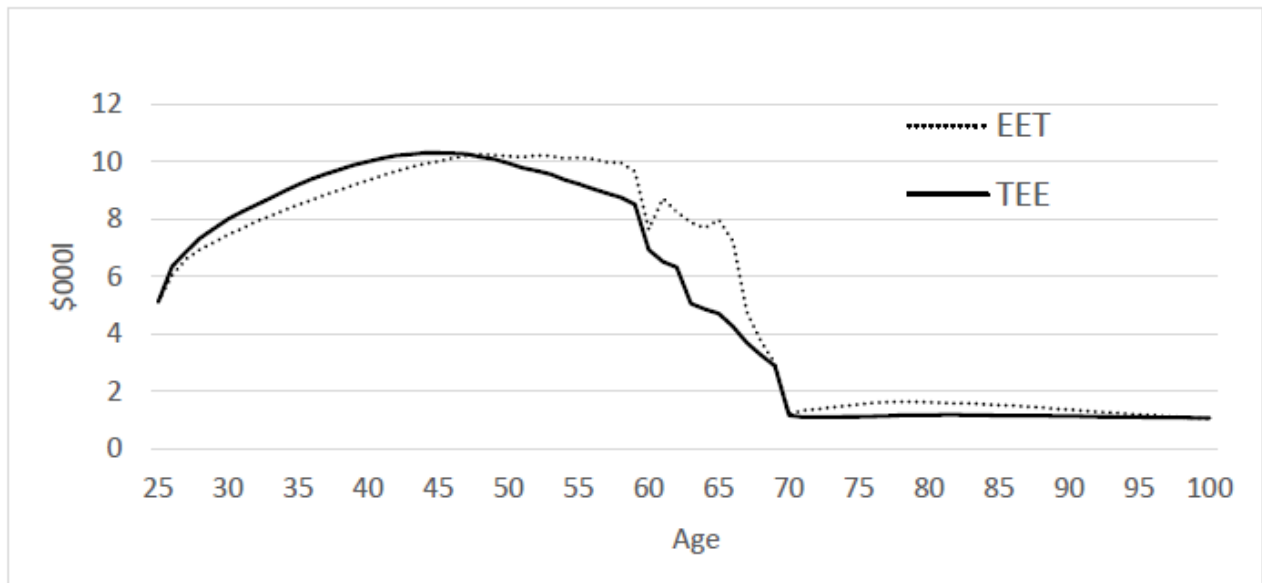
There are also some interesting differences across population subgroups (see Figure 1). Specifically, claiming ages

of the less than HS group are similar in both tax regimes, primarily because this group saves and accumulates fewer assets than the better-educated. Moreover, under both interest rate environments, claiming age changes for this group are small: women (men) lacking a high school degree work only 0.5 (3) month more under the TEE regime in a low interest rate environment, while college+ men and women defer claiming benefits by over a year. The tax regime has the largest impact on college-educated women who work 16 months longer given a high real rate in the TEE setup. Accordingly, more educated and wealthier workers would work substantially longer under Rothification, with little impact on the less-educated.

Tax payments

Next we compute average individual tax payments over the life cycle under both tax regimes; the computation

Figure 2: Average Annual Tax Payments per Individual: EET versus TEE (Roth) Tax Regimes



Notes: The figure shows average annual tax payments (sum of income taxes, payroll taxes, and penalty tax for early withdrawals) over the life cycle per individual for EET versus TEE taxation based on low interest rates (1%). Values are based on 100,000 simulated life cycles for each of the six subgroups (men/women and three education groups) using optimal feedback controls from the life-cycle model. Results for the entire population are computed using the following weights for the three education levels: women (61% Coll+; 28% HS; 11% <HS) and men (57% Coll+; 30% HS; 13%<HS); the weights for women is 51% and for men 49%.

includes payroll, income, and penalty taxes for early withdrawals. As anticipated, EET tax payments are lower during the first 25 years of the work life, since 401(k) contributions are not part of taxable income; by contrast, under the TEE regime, workers must pay taxes on both own and employer matching contributions. Yet the situation changes around age 50 when EET tax payments rise, and the difference is particularly marked between ages 62 and 70. Thereafter, tax payments in both scenarios are relatively low. This is because in both tax regimes, workers begin curtailing their work hours after age 50 and finance their consumption by 401(k) withdrawals. From age 60 on, 401(k) withdrawals are not subject to the 10% penalty tax in both tax regimes, but withdrawals from EET accounts are part of taxable income which results in higher tax payments in contrast to the TEE world. The difference in tax payments is particularly large between ages 62 to 70. Overall, we conclude that tax payments are higher in the short run in the TEE regime, but lower in the long run.

Impact on inequality

To investigate inequality measures, we measure relative

wealth, income, and consumption inequality in terms of the ratio of college graduates' values to those of high school dropouts as of age 62 under the two tax scenarios. The higher is this ratio, the greater the inequality along this dimension. Regardless of the interest rate environment, our inequality metrics are greater under the TEE regime. Consumption inequality is also greater under TEE taxation of retirement savings.

Conclusions

Our richly-specified formulation of lifetime behavior calibrated to U.S. households provides several lessons for those interested in an alternative tax regime for pension plans. Overall, we show that that taxing pension contributions instead of withdrawals leads to later retirement ages, especially for the better-educated; reduces lifetime work hours; and increases wealth and consumption inequality. Market returns do matter but our overall conclusions remain robust. Finally, lifetime tax payments are lower by 6% to 10% under the Rothification tax regime. ❖

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