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Would raising the required minimum distribution age for retirement accounts enhance old-age security?

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Abstract

Defined contribution plans and Individual Retirement Accounts are key tax-qualified mechanisms helping private sector workers accumulate assets for retirement, now worth almost $20 trillion in the U.S. An underestimated but influential tax rule shaping the optimal design of such retirement plans is the "Required Minimum Distribution" (RMD) rule, which requires retirees to withdraw a minimum amount from their retirement accounts each year. If withdrawals fall below the RMD threshold, retirees must pay a 50% excise tax (as well as income tax). Initially the RMD was computed such that the sum of the retiree's annual payouts starting at age 70.5 was anticipated to exhaust her 401(k) by her life expectancy. The 2019 Secure Act raised the RMD age for tax-qualified plans from 70.5 to 72, and indeed some now propose raising it even further or even abolishing it. Here we use a calibrated lifecycle consumption/portfolio choice framework to model and measure the potential impact on household financial behavior resulting from delaying the RMD age. We show that delaying, or indeed abolishing, the RMD would have little effect during the worklife, but during retirement, the impacts are in a few cases, more notable. For those lacking a bequest motive, even abandoning the RMD rules would change little. Yet for households with a bequest motive, the age-70.5 RMD rule was quite restrictive, since such a household preferred to make fewer withdrawals than required and use the 401(k) as a tool to transfer financial wealth to the next generation. A higher RMD age therefore moves taxes paid by the wealthy to older ages. Finally, if the RMD rule were abandoned, we estimate that overall tax revenues would change little, even for households with a bequest motive.

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U.S. tax law has long required older Americans to withdraw a minimum amount from their tax-qualified retirement accounts each year, and then to pay tax on that income. Moreover, if the withdrawals are insufficiently large, retirees must pay a 50% excise tax on any amount under-withdrawn. Known as the Required Minimum Distribution Rule (RMD), this mandatory withdrawal policy was initially set at age 70.5. The required payout was selected so that the sum of the retiree's annual payouts starting at age 70.5 would be expected to exhaust her 401(k) balance by her expected age at death (IRS 2015b). The rationale for an RMD policy was that contributions and investment earnings in both tax-qualified 401(k) and IRA accounts have traditionally been tax-exempt until the money is paid out. If, however, the retirement saver were to die prior to drawing down her entire account, the remaining assets would pass to her heirs and be taxed over their longer remaining years. Particularly when heirs are much younger than the decedent, this could result in much lower taxes collected than otherwise.[1] Therefore, the RMD rule was implemented to get retirement account savers to pay income tax on their pre-tax contributions and investment earnings before their deaths.[2]

The SECURE Act of 2019 has recently extended the age for required minimum distributions to age 72, and several advocates seek to raise it even later, to age 75 (Waddell 2019; Kapadia and Hershberg 2020); moreover, a full abandonment of the RMD rules may also become a reality (Berry 2020). Yet since "RMDs are [intended] to generate taxable income from these distributions, it probably won't help the federal deficit if they push the age back," according to a financial adviser (Malito, 2018: np). Indeed the U.S. Joint Committee on Taxation (JCT 2019) estimated that tax revenue would fall by $8.9 billion over the period 2019-2029, as a result of raising the RMD age to 72. Whether and how Americans might respond to the deferral of the RMD is the subject of this paper, wherein we seek to determine the impact on saving/consumption patterns, contribution/withdrawal paths in and outside tax-qualified accounts, and work hours/retirement patterns. To investigate and quantify potential outcomes, we develop a realistically-calibrated lifecycle model with optimal consumption, investment, work hours, and retirement decisions for households with different demographic characteristics (e.g., education, sex, health status). The model also evaluates the tax implications of alternative RMD rules. Our research, therefore, contributes to the literature on household finance as well as to the policy debate, by analyzing the implications of delaying the Required Minimum Distribution age in tax-qualified retirement plans.

We document that delaying the RMD has little impact during the worklife, including on savings and asset allocation in and outside tax-qualified retirement accounts. Additionally, Social Security claiming behavior is almost unaffected. By contrast, significant changes are observed during the retirement period, depending on whether older people have a bequest motive or not. For those lacking a bequest motive, the age-70 RMD rules are not particularly restrictive as optimal expected withdrawals from 401(k) plans are substantially higher than the RMD pattern required by the IRS. This conclusion holds for both the age 70 RMD age as well as ages 72 and 75; we also show that even if the RMD rules were abandoned, withdrawal behavior would change little. By contrast, when a household has a bequest motive, the situation changes significantly. Under the age-70 rule, the RMD is quite restrictive, since such a household would prefer to make fewer withdrawals than required and use the 401(k) plans as a tax-favored tool to transfer financial wealth to the next generation. We also show, interestingly, that even if the RMD rule were completely abandoned, tax payments would change little, even for households with a bequest motive.

In what follows, we develop a realistically calibrated discrete time lifecycle model (using U.S. data) for a utility-maximizing investor with endogenous work hours, retirement behavior, consumption/saving, and portfolio choice including risky stocks and bonds held in and

[1] The 2019 SECURE Act required that inherited retirement accounts for nonspouses be paid out over a maximum of 10 years, resulting in higher taxable distributions and thus higher tax payments than otherwise (Hartman 2020).

[2] Roth account holders are not subject to RMD rules, though their beneficiaries are. We do not consider Roth accounts in this paper.

outside a tax-deferred retirement plan.[3] The model embeds exogenous background risks (labor income, capital market, out-of-pocket medical expenditures), incorporates realistic rules on income taxes, and includes regulations regarding Social Security benefit claiming options. Just as importantly, the model also integrates real-world rules characterizing tax-qualified 401(k) accounts including pre-tax contributions, employer matches, penalty-taxes on early withdrawals, and RMD withdrawal amounts. Our results using calibrated baseline parameters agree closely with observed U.S. household consumption, saving, and Social Security claiming ages. Specifically, the model generates a large peak at the earliest claiming age of 62, along with a second peak at the (system-defined) Full Retirement Age. Our model also matches the current distribution of 401(k) wealth rather nicely.

We use this realistic calibrated life cycle approach to generate optimal consumption, retirement patterns and portfolio allocations in a baseline case, and then we compare the same outcomes across different RMD scenarios.

Model and calibration

Time budget, labor income, and retirement benefits. Our lifecycle model assumes a representative worker with yearly decision periods starting at the end of age 24 ($t = 0$) until the maximum age of 100 ($T = 76$). This worker has the opportunity to allocate up to $(1 - l_t) = 0.6$ of her available time budget to paid work (assuming 100 waking hours per week and 52 weeks per year). Depending on her work effort $(1 - l_t)$ and the wage rate WR_t, the yearly before-tax labor income during working life is given by:

$$Y_{(t+1)} = (1 - l_t) \cdot WR_t. \qquad (1)$$

The uncertain wage rate $WR_t = w_t \cdot P_t \cdot U_t$ consists of an age-dependent deterministic component (w_t), an uncertain permanent component $P_{t+1} = P_t \cdot N_{t+1}$ with independent lognormal distributed shocks $N_t \sim LN(-0.5\sigma_P^2, \sigma_P^2)$ and a transitory shock $U_t \sim LN(-0.5\sigma_U^2, \sigma_U^2)$ assumed uncorrelated with N_t. Our calibration of the deterministic component of the wage rate process and the variances of the permanent and transitory wage shocks follows Horneff, Maurer, and Mitchell (2020a Table A1). Drawing on the 1975–2015 waves of the Panel Study of Income Dynamics (PSID), they estimated the corresponding parameters separately by sex and three educational levels: less than High School (<HS), High School graduate (HS), and at least some college (Coll+).

Between ages $62 \le K \le 70$, the household may retire from work and claim Social Security benefits which result in the yearly retirement income ($t \ge K$) of:

$$Y_{t+1} = PIA_K \cdot \lambda_K \cdot \varepsilon_{t+1} \qquad (2)$$

Old age retirement benefits depend on the worker's Primary Insurance Amount (PIA) and an adjustment factor λ_K for early or delayed claiming. The $PIA = \min[0.9AIME; 8{,}916 + 0.32(AIME - 9{,}912); 24{,}876 + 0.15(AIME - 59{,}760); 33{,}648]$ is a piecewise linear function of (12 times) the worker's average indexed lifetime earnings (AIME). If a worker claims benefits at the system-defined Normal Retirement Age of 66, the PIA replaces 90% of the first $9,912 of average lifetime earnings, plus 32% of earnings between $9,912 through $59,760, plus 15% of earnings over $59,760 up to the cap ($118,500).[4] An adjustment factor permanently decreases (increases) benefits if an individual claims benefits before or after the Normal Retirement Age of 66. More specifically, the factors we use are $\{\lambda_{62} = 0.75; \lambda_{63} = 0.8; \lambda_{64} = 0.867; \lambda_{65} = 0.933; \lambda_{66} = 1.0; \lambda_{67} = 1.081; \lambda_{68} = 1.16; \lambda_{69} = 1.24; \lambda_{70} = 1.32\}$. Finally the variable ε_t is a independent lognormal distributed transitory shock $\varepsilon_t \sim \mathrm{LN}(-0.5\sigma_\varepsilon^2, \sigma_\varepsilon^2)$, which reflects out-of-pocket medical expenditure shocks in retirement (as in Love 2010). If the individual works beyond age 62, the model stipulates that she must devote at least one hour per week (our model rules out overtime work in retirement ($0.01 \le 1 - l_t \le 0.4$)).

[3] In doing so, our research builds on Horneff, Maurer and Mitchell (2019, 2020a); Kim, Maurer, and Mitchell (2016); Hubener, Maurer, Mitchell (2016);

[4] Our model uses 2017 parameter levels, though these are raised each year with inflation (US SSA nd_a b) and our model focuses on real rather than nominal values. Following Chai et al. (2011), the PIA is approximated using permanent income in the optimization. In the simulation of optimal life cycles, we use the 35 best years of earnings to specify the PIA and adjust the corresponding permanent income state.

Wealth dynamics. The household can use current cash on hand for consumption C_t, investments in risky stocks $S_t \geq 0$, riskless bonds $B_t \geq 0$ and contributions $0 \leq A_t$ in tax-qualified 401(k) plans which are taxed according to an EET-regime: that is, workers contribute to their retirement accounts out of pre-tax earnings up to a yearly limit, recognize pre-tax investment earnings in their accounts, and pay income tax on withdrawals during retirement.[5] After retirement at age K, no further contributions $A_t = 0$ ($t \geq K$) can be made into 401(k) plans. Hence, cash on hand X_t in each year is given by:

$$X_t = C_t + S_t + B_t + A_t \qquad (3)$$

One year later, her cash on hand is given by the value of stocks (bonds) having earned an uncertain (riskless) gross return of R_{t+1} (R_f), plus income from work after age-dependent housing costs h_t (as in Love 2010), plus withdrawals (W_t) from the 401(k) plan, minus taxes (Tax_{t+1}):

$$X_{t+1} = S_t R_{t+1} + B_t R_f + Y_{t+1}(1 - h_t) + W_t - (Tax_{t+1}) \qquad (4)$$

Our financial market parameterizations assume a risk-free interest rate of 1% and lognormal distributed stock return $\ln(R_t) \sim N(0.05; 0.18)$ with a mean of 5% and a return volatility of 18%. Following Horneff, Maurer, and Mitchell (2020a), households must pay three kinds of taxes: payroll taxes, federal income taxes, and penalty taxes for early withdrawals from 401(k) plans. Payroll and income taxes are proportional to the worker's annual earnings, and they amount to 11.65% until retirement (the sum of 1.45% Medicare, 4% city/state tax, and 6.2% Social Security contributions up to a cap of $118,500 per year). After retirement, Social Security and Medicare contributions are generally no longer paid. In addition, both workers and retirees pay federal income taxes, which depend on taxable income and the corresponding progressive marginal tax rates for each of the seven tax brackets (for details, see IRS 2015a and Appendix B in Horneff et al. 2020a). This taxable income consists of labor earnings minus housing costs (and part of Social Security benefits[6]), investment income, and withdrawals from 401(k) plans. Own contributions into 401(k) plans and a general standardized deduction of $6,300 reduces the worker's taxable income. Finally a penalty tax of 10% is payable on withdrawals from 401(k) accounts prior to age 59½ ($t = 36$). As in Lusardi, Michaud, and Mitchell (2017), if a worker's cash on hand falls below $X_{t+1} \leq \$5{,}879$ p.a., the model posits that she receives a minimum welfare benefit of the next year.

Retirement accounts and RMD rules. The worker's assets in her tax-qualified retirement plan are invested in a portfolio of risky stocks and bonds. Letting $\omega_t^S \geq 0$ be the relative exposure to equity, this portfolio generates a gross portfolio return of $R_{t+1}^{401(k)} = \omega_t^S R_{t+1} + (1 - \omega_t^S) R_f$. Prior to the endogenous retirement age $t = K$, the total value (F_{t+1}) of 401(k) assets at time $t + 1$ is, therefore, determined by the previous period's value minus any withdrawals ($W_t \leq F_{t+1}$), plus additional own contributions (A_t), plus any employer match (M_t), and returns on stocks and bonds. After retirement, no additional own contributions are possible ($A_t, M_t = 0$). From age 70.5 onwards, plan participants must take payouts from the retirement account, defined as a certain fraction (m_t) of the account value according to the Required Minimum Distribution rules; the latter are based on remaining life expectancy specified by the IRS Uniform Lifetime Table (IRS 2015b).[7] Withdrawals below this threshold lead to a penalty tax of 50% on the under-withdrawal; moreover the penalty tax is taken directly from the 401(k) account. Additionally, we also consider cases with the RMD raised to age 72 or no RMD rule at all. The dynamics for the retirement account evolve as follows:

$$F_t = \begin{cases} (F_t - \mathrm{W_t} + A_t + M_t) R_{t+1}^{401(k)} & for\ t < K \\ (F_t - \mathrm{W_t}) R_{t+1}^{401(k)}, & for\ t < RMD_{age} \\ (F_t - \mathrm{W_t}) R_{t+1}^{401(k)} - \max(0.5(m_t F_t - W_t), 0), & for\ t \geq RMD_{age} \end{cases} \qquad (5)$$

[5] Our model uses a yearly own contribution limit of $18,000 until retirement regardless of age; the IRS constraint permits additional catch-up contributions of $ 6,000 for those over age 50.

[6] Up to 85% of Social Security benefits may be subject to income tax for higher-income households, yet due to generous exemptions, many households receive their Social Security benefits tax-free. See Horneff et al. (2020 Appendix B) and US SSA (nd_c).

[7] If an individual remains employed at the same firm at which he has his retirement plan, he may not be required to take an RMD until he stops working.

We assume that the employers match 100% of employee contributions up to 5% of yearly labor income so that the 401(k) plan can avoid complex non-discrimination testing.[8] Due to tax regulation, the matching rate is only applied to a maximum compensation of $265,000, so the overall matching contribution is given by $M_t = \min(A_t, 0.05Y_t, \$13{,}250)$

Preferences and numerical solution. The worker derives utility from a composite good consisting of consumption C_t and leisure time l_t (normalized as a fraction of total available time), modelled by the time separable power utility function $u_t(C_t, l_t) = \frac{(C_t l_t^{\alpha})^{1-\rho}}{1-\rho}$. After retirement $l_t = 1$, the individual enjoys full leisure. The parameter α measures her leisure preferences; ρ is the coefficient of relative risk aversion; and β is her time preference factor. In addition, she receives utility from passing on financial wealth to the next generation in case of death, both in and outside her tax-qualified accounts $Q_t = F_t + S_t + B_t$. The parameter $b \geq 0$ measures the strength of her bequest motive. The recursive definition of the value function of this dynamic stochastic programming problem is given by:

$$J_t = \frac{(C_t l_t^{\alpha})^{1-\rho}}{1-\rho} + \beta E_t \left(p_t J_{t+1} + (1-p_t) b \frac{\left(\frac{Q_{t+1}}{b}\right)^{1-\rho}}{1-\rho} \right) \quad (6)$$

with terminal utility $J_T = \frac{(C_T)^{1-\rho}}{1-\rho} + \beta E_T \frac{b\left(\frac{Q_{t+1}}{b}\right)^{1-\rho}}{1-\rho}$.

The age-dependent yearly survival probabilities p_t are taken from the U.S. population life table provided in the National Vital Statistics Report (Arias 2010).

We posit that households in each of the six subgroups (male/female with <HS, HS, and Coll+) maximize the value function (6) subject to the constraints and calibrations set out above, by optimally selecting their consumption, work effort, Social Security claiming age, contribution/ withdrawals from tax-qualified 401(k)-plans, 401(k) equity exposure, and investments in stocks and bonds. The numerical procedure to generate the optimal policy functions in each period assumes a four-dimensional discrete state space grid $35(X)\times25(F)\times8(P)\times9(K)$, with X being cash on hand, F 401(k) assets, P permanent income, and K the claiming age.

Calibration of preference parameters. Calibration of preference parameters (assumed to be unique for each of the six subgroups) follows the procedure outlined in Horneff et al (2020b). Our aim is to ensure that the model outcomes simultaneously match empirical claiming rates reported by the U.S. Social Security Administration (US SSA 2015), as well as average assets in 401(k) plans reported in EBRI (2017). For each of the six subgroups, we solve the life cycle model under the tax-regime in 2015 (i.e., prior to the 2018 reform), generate 100,000 simulated lifecycles using optimal feedback controls, and calculate average claiming rates and 401(k) account balances. These six subgroups are then aggregated to obtain population mean values using National Center on Education Statistics (2016) weights.[9] This procedure generates a coefficient of relative risk aversion $\rho = 5$, time discount rate $\beta = 0.96$, and leisure parameter $\alpha = 1.3$ that most closely match simulated model outcomes as well as empirical evidence on both average assets in tax-qualified retirement accounts and Social Security claiming ages. For the cases with bequest motive, we assume $b = 2$, in line with parameters reported in prior lifecycle studies.[10]

What would delaying the RMD age do?

In what follows, we solve the calibrated lifecycle models for households with and without a bequest motive and compare outcomes for three different RMD approaches. The first assumes the RMD start age is 70.5 (RMD-70), the second has a start age of 72 (RMD-72), the third starts at age 75, and the last setting eliminates the RMD altogether (w/o RMD). Table 1 shows how expected

[8] See Willson (2019) for a discussion of 401(k) safe harbor plans. Love (2007) reported a value of 100% matching to 6% in US defined contribution plans.

[9] Specifically, the weights are 50.7% female (61% with Coll+, 28% with HS, and 11% with <HS), and 49.3% male (57% with Coll+, 30% HS, and 13% <HS).

[10] See Gomes and Michaelides (2005), Love (2010), and Hubener, Maurer, and Rogalla (2014).

outcomes change for claiming ages, work hours, 401(k) assets, assets in non-qualified accounts, consumption, and tax payments of households over the life cycle.

Column A (on the left) represents outcomes for workers having no bequest motive, and Column B (on the right) for those with a bequest motive.

Table 1. Model-generated average outcomes: claiming ages, hours worked, 401(k) and other assets, consumption, and tax payments

	Column A: w/o Bequest				Column B: with Bequest			
	RMD start age 70	RMD start age 72	RMD start age 75	w/o RMD	RMD start age 70	RMD start age 72	RMD start age 75	w/o RMD
1. Average Claiming Age								
Age 62-70	64.9	64.9	64.9	64.9	65.3	65.3	65.4	65.3
2. Average Work Hours per Week								
Age 25-61	33.9	33.9	33.9	33.9	36.8	36.8	36.9	36.7
3. Average 401(k) Assets in $000								
Age 25-61	101.3	101.3	100.3	102.6	131.7	132.3	131.1	133.1
Age 62-100	55.8	55.0	56.0	56.3	88.7	89.6	89.3	93.2
4. Average Non-Qualified Assets in $000								
Age 25-61	7.2	7.2	7.9	7.1	7.5	7.3	7.8	7.2
Age 62-100	10.0	10.1	9.8	9.9	15.3	15.1	15.1	12.2
5. Average Consumption in $000								
Age 25-61	26.2	26.2	26.1	26.2	26.7	26.7	26.7	26.7
Age 62-100	23.0	23.0	23.0	23.0	24.7	24.7	24.7	24.7

Notes: We report average outcomes derived from 100,000 simulated lifecycles based on optimal feedback controls from the life cycle model using income profile for six subgroups. Results for the entire population use education weights for females (males): 61% +Coll; 28% HS; 11% <HS (57% +Coll; 30% HS; 13%<HS). Parameters in the baseline calibration are: risk aversion $\rho = 5$; time preference $\beta = 0.96$; leisure preference $\alpha = 1.2$; endogenous retirement age 62-70. Results with a bequest motive assume $b = 2$. Social Security benefits are based on average permanent income and the bend points in place in 2015. The risk premium for stocks returns is 5% and return volatility 18%; the risk free rate in the baseline case is 1%. Source: Authors' calculations

Column A shows that, for households without a bequest motive, delaying the RMD start age from 70 to 72 or 75, or even eliminating it, has little effect on expected lifecycle patterns. That is, the average claiming age is about age 64.9, work hours average 33.9 per week, and average yearly consumption stands at $26.2K during the worklife (ages 25-61) and at $23K in retirement (ages 62-100). Additionally, annual average tax payments hardly change across RMD regimes, as they amount to $8.4K during the worklife (ages 25-61) and $2.2K in retirement (ages 62-100). Asset accumulation changes only slightly: workers and retirees have on average $1.3K more in their 401(k) accounts with no RMD rules, versus the other two cases with RMDs. No major changes are identified for the assets held in non-qualified accounts.

More substantive changes are evident when people with bequest motives face different RMD scenarios. Comparing Columns A and B, for all three RMD settings, we find that people with bequest motives tend to claim old age benefits from Social Security about 0.4 years later, work 3 hours more per week, accumulate about

$30K more in 401(k) plans, and hold $5K more in non-qualified plans. The fact that these individuals work more and accumulate more assets indicates that they not only wish to bequeath more to their heirs, but they also consume more in retirement.

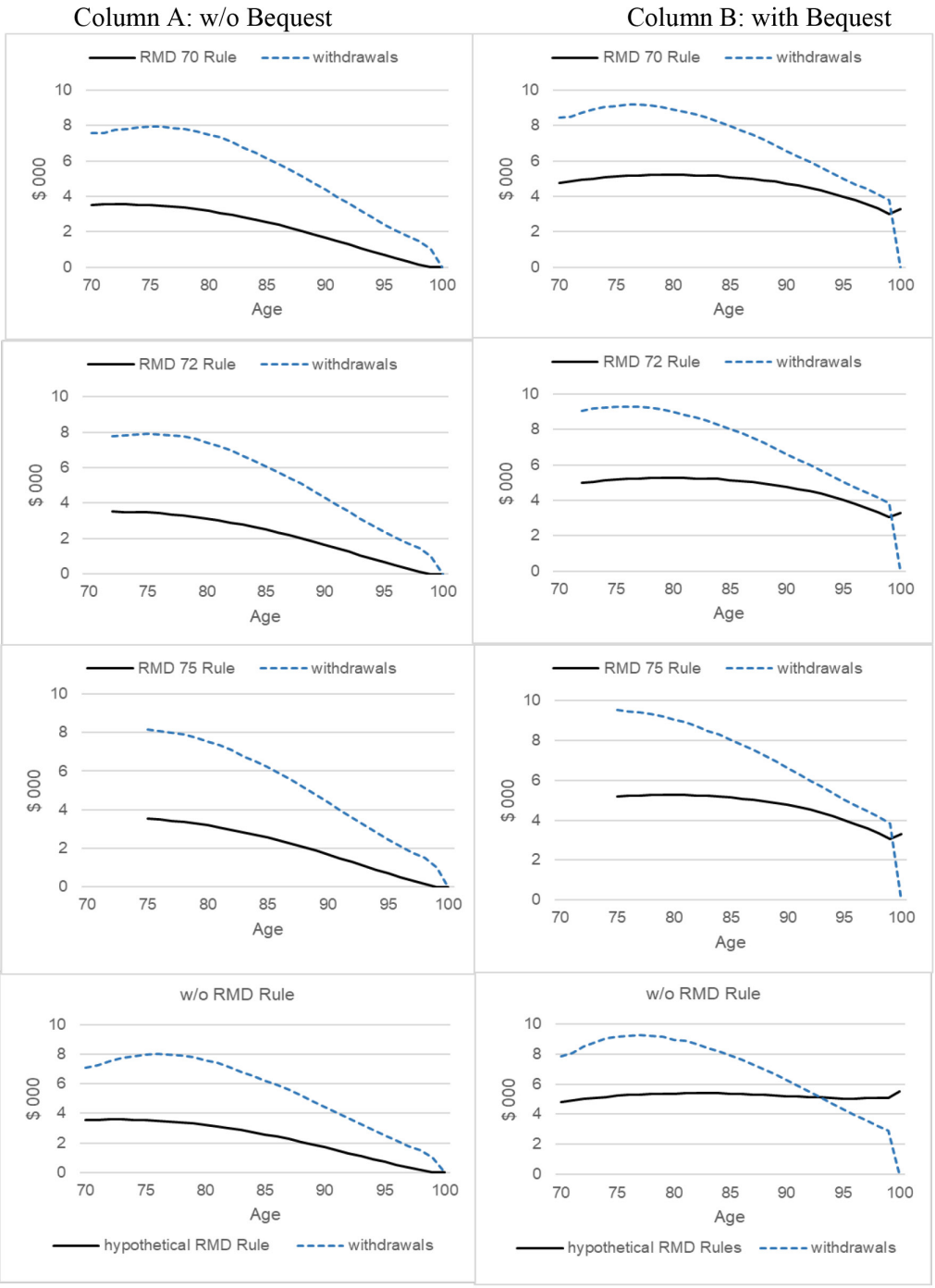
Moreover, a comparison of results across the three RMD settings in Column B shows that claiming ages, work hours, consumption, and tax payments are virtually unchanged across the scenarios, but they do generate remarkable differences in retiree wealth patterns. For instance, retirees who must comply with age 72 RMD rules instead of age 70 hold $1K more, on average, in their 401(k) accounts. Abolishing the RMD rules boosts average 401(k) assets to $99.3K, $3.5K above those seen in the RMD 70 case. At the same time, peoples' investments in non-qualified accounts fall from $15.3K to $12.2K.

How restrictive are the RMD rules?

Thus far, we have shown that delaying the age of RMD has little impact on households' behavior if they lack bequest motive, whereas people desiring to leave a bequest will seek to withdraw less from their 401(k) accounts. Next, we investigate whether, and for whom, RMDs serve as a binding constraint for optimal withdrawal behavior.

Figure 1 illustrates average optimal withdrawals from 401(k) plans (dashed lines) predicted by our lifecycle model, versus the minimum average amount ($m_t F_t$) that must be withdrawn (black lines) under the three RMD scenarios. We compute these as a multiple of the RMD share m_t and the household's current assets F_t. People with a bequest motive appear on the left (Column A) versus no bequest on the right (Column B). Accordingly, results appearing in the first (second) row indicate behavior for an RMD rule starting at age 70, age 72, and age 75. The third row shows optimal withdrawals if the RMD were to be completely abolished. Here the black line is, of course, only hypothetical; that is, it serves as a benchmark to show how strongly the households who design their optimal withdrawal plans with no restriction would have been constrained by the introduction of an age-70 RMD rule.

Figure 1. Average optimal withdrawals vs. average RMD rules from 401(k) plans



Notes: The two Columns report average optimal withdrawal patterns (dashed lines) versus RMDs (black lines) for 401(k) plans; in Column A retirees lack a bequest motive and in Column B retirees do have a bequest motive. Here the RMDs serve as a hypothetical reference to show how restrictive they would be if applied (in this figure, when desired withdrawals fall below the RMD rule, no penalty taxes must be paid). For additional information on parameters and calibrations see Table 1. Source: Authors' calculations.

For all four panels in Column A, the dashed lines tracing expected optimal withdrawals are substantively above the RMD withdrawal black lines, at all ages. Also, both lines decline over time, since as the retiree spends from her account, her 401(k) balance falls with age. We conclude that for an individual without a bequest motive, the regulatory lower limit on withdrawals due to the RMD is not restrictive at all. This individual intends to consume all her assets to generate a constant lifetime consumption stream, and the best way to achieve that goal is to withdraw enough. Any remaining assets transferred to the next generation is random, depending on whether the retiree dies early or late.

A significantly different picture is evident from the pictures in Column B, which compares the expected optimal and regulatory required minimal withdrawals for a retiree having a bequest motive. For both the RMD 70.5 and 72 ages, expected optimal withdrawals are still larger than the required minimum withdrawals. Yet the distances between the optimal withdrawal dashed line and the black lines (RMD) are substantially smaller than without a bequest motive. This indicates that retirees seek to use their 401(k) accounts as a means to pass on inheritances. At age 100, the amount withdrawn is zero, although the retiree still has assets in her 401(k) plan and must make a minimal withdrawal (black line). This is because, in the last period of life, the individual bequeaths her remaining assets and pays no RMD penalty tax in death.

The above conclusion is reinforced if the RMD were to be completely abolished. In the bottom row of Column B—the case with no RMD—the optimal withdrawals dashed line crosses the black line (RMD-70) at age 92. This clearly demonstrates that a retiree seeking to use the 401(k) account to transfer financial assets to the next generation finds the RMD restrictive, forcing her to withdraw more from her 401(k) account than she would prefer.

A more granular look at this result is provided by calculating the probabilities that an individual with optimal lifecycle behavior withdraws less than the RMD (conditional on survival). It will be recalled that, in this case, the retiree would have to pay the 50% penalty tax on the shortfall of the withdrawal amount. Results for the three education levels of interest appear in Table 2. Without a bequest motive (Column A), the probabilities are low for persons at all education levels. For example, the likelihood of paying a penalty tax for retirees having a College education and no bequest motive amounts to only 2.7% under the RMD 70 rule, and just 2.5% for the RMD 72 rule. For people with less education (High School dropout or High School graduate), the probabilities still remain low. In other words, households lacking a bequest motive generally wish to avoid the 50% penalty, so they take at least as much as the RMD rules require. The reason why any in this group pay penalty taxes at all should be viewed as coincidental. For instance, in the event of unusually high stock returns, the 401(k) asset value can rise sharply, along with the RMD amount that must be withdrawn. At the same time, the retiree does not wish to withdraw her full RMD to avoid depleting her retirement account too quickly in the event of a subsequent decline in the market.

Table 2. Probability (%) of paying a penalty tax for withdrawals falling below the RMD

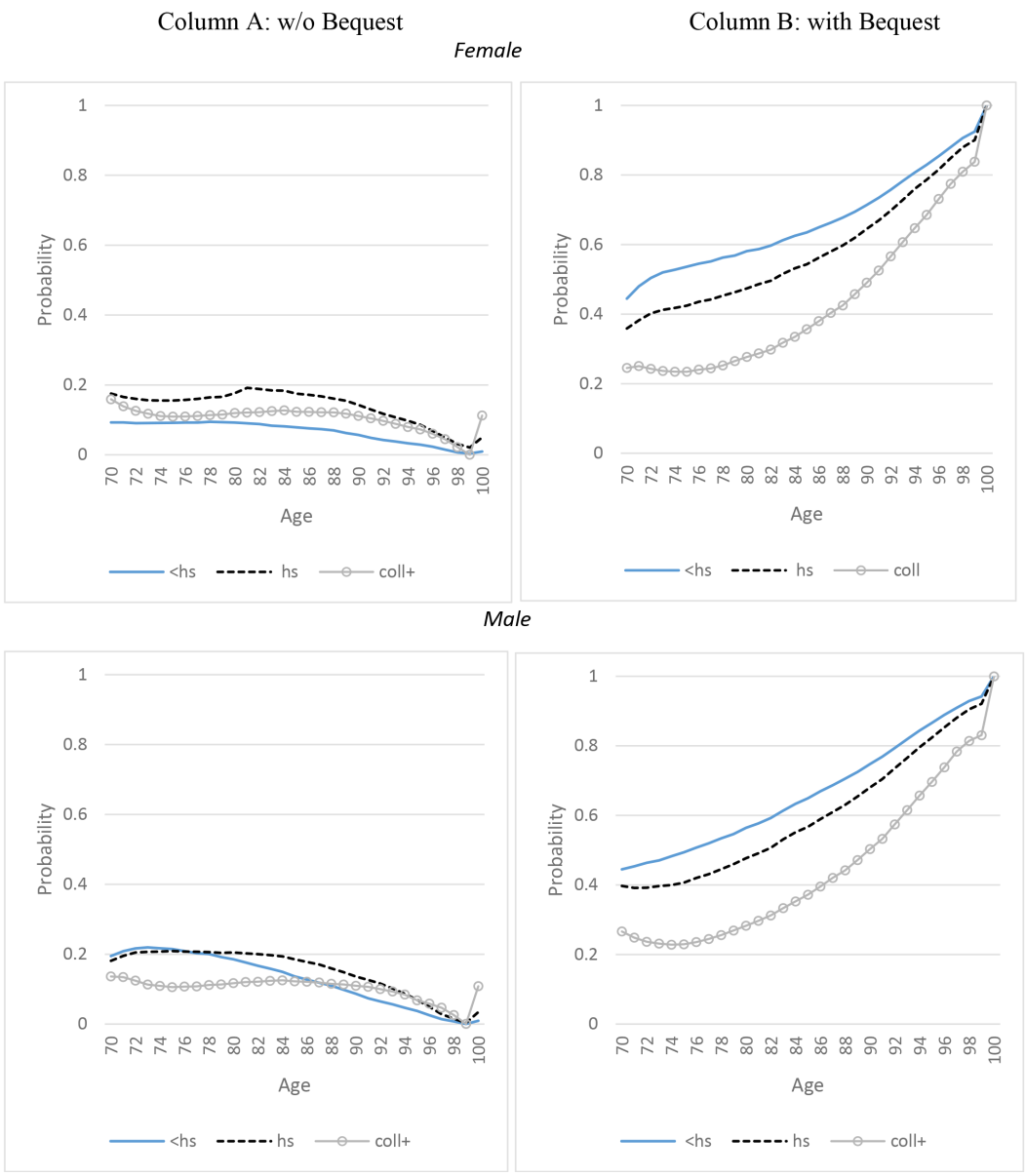
	Column A w/o Bequest			Column B with Bequest		
	RMD 70	RMD 72	RMD 75	RMD 70	RMD 72	RMD 75
<hs	2.8	2.5	2.1	12.5	11.8	10.8
hs	4.2	3.9	3.5	10.8	10.2	9.2
coll+	2.7	2.5	2.1	6.8	6.5	6.1
total	3.2	2.9	2.5	8.6	8.2	7.6

Notes: This table reports the probability (%) that an individual at age 25 will pay a penalty tax because of lower withdrawals than those required by the RMD rules (conditional on survival). Results are based on 100,000 simulated optimal lifecycles for three different education groups. For other parameters and calibrations, see Table 1. Source: Authors' calculations.

For households having a bequest motive (Column B), the chance that a retiree would optimally elect to withdraw less than the RMD rises to 6-12%, depending on the subgroup. In fact, some households would even willingly pay the penalty tax to favor the bequest over own consumption from the account. Yet as we see, this happens quite rarely, since most withdraw at least the amounts required under the RMD rule.

Figure 2 illustrates the age pattern of probabilities without a penalty tax: the RMD is only provided as benchmark to show how much it would restrict optimal behavior. Here we show results differentiated by sex for three different educational groups (<HS, HS, Coll+). We also consider cases both without (Column A) and with (Column B) a bequest motive. The top panel describes results for women, and the bottom for men. The dashed lines indicate the probability that an individual takes less from her 401(k) plan than would result from a hypothetical RMD-70 rule (black lines).

Figure 2. Probability of withdrawals falling below the RMD at age 70



Notes: The two Columns report the probabilities for six subgroups (male/female with <HS / HS / Coll+ education) of optimal withdrawals falling below the benchmark RMD at age 70. Column A (B) depicts retirees without (with) a bequest motive. No penalty taxes are levied if withdrawals fall below the RMD at age 70 in this hypothetical case, so the RMD lines serve as a benchmark to illustrate how restrictive they would be if applied. Authors' calculations.

The evidence indicates that both men and women lacking a bequest motive will seek to withdraw less than the RMD, if possible. In Column A, the probabilities are between 9% and 20%, depending on the retiree's educational level. Even more interesting are the results in Column B, where we see that those with a bequest motive would leave money in their 401(k) plans more often than they would if the RMD rule applied. Among both men and women, many of the least educated (<HS) retirees would be quite constrained under the RMD rule: in fact, at the age of 70, 44% of the least educated find the RMD rule restrictive, and by the age of 92, about 80% of the men and 75% of the women do so.

The results thus support the conclusion that households having a bequest motive are most constrained by the RMD rules. In contrast, households lacking such a motive are hardly constrained at all by this policy.

Implications for lifetime tax payments

Next, we explore the possible impacts of delaying the RMD rule on tax payments over the individual's lifecycle. Based on the simulated optimal lifecycles profiles for the six different subgroups, we calculate for each individual i the income tax payments $IT_{i,t}$ from age 70 until the maximum age 100 (including penalty tax payments). To obtain a representative distribution for the total population, the number of simulations for the different subgroups (male/female with <HS, HS, Coll+) depends on population weights by sex and education. To reflect mortality risk, we multiply the resulting outcomes by the multi-year survival probability that the individual is still alive at this age $p_{0,t} = \prod_{j=0}^{t} p_j$. Formally, this is defined as:

$$IT_{i,t}^{pop.} = p_{0,t} \cdot IT_{i,t}. \qquad (7)$$

and it reflects the probability distribution of tax payments per individual at a certain age. We perform this analysis for the four RMD approaches considered, and for households with as well as without a bequest motive. To evaluate the implications on tax payments of the three different RMD rules we calculate the mean value and the 99% quantile at each age. Results are reported Figure 3.

Figure 3. Development of lifecycle tax payments for different RMD rules

Notes: The figures report summary statistics (mean, 99% Quantile) of individual tax-payments (including penalty taxes) from age 70 until 100 for three different RMD: starting at age 70, starting at age 72, starting at age 75, and no RMD rule. Column A (B) depicts retirees without (with) a bequest motive. Outcomes for the entire populations are generated using 200,000 simulations paths based on optimal feedback controls for the six subgroups. The number of simulations for the different subgroups (male/female with <HS, HS, Coll+) are based on the weights reported in Table 1. Authors' calculations.

In comparison to the RMD 70 (blue line), the RMD 72 rule (black dotted line) shows slightly lower tax payments between ages 70 and 72; this arises because retirees use this period to make fewer withdrawals from their 401(k) accounts. Starting from age 72, the tax payments due to the RMD 72 rule are now somewhat higher. This results from a catch-up effect, since more assets remain in the 401(k) plan until age 72, the withdrawals and thus the tax payments are higher when the RMD rule takes effect at age 72. Accordingly, the reduced tax payments between 70 and 72 are therefore postponed to the later RMD age. Actual tax shortfalls occur only if the individual dies in the meantime. This effect is also evident in the recently-proposed further postponement of the RMD rule to age 75.

Figure 3 illustrates the effects for the 1% of the people paying the highest tax. Here the catch-up effect is clear: the dashed line (RMD 72) intersects the blue line (RMD 70) at age 72, and remains above it until about age 80. This persists for an RMD age of 75. The effect is also clear in both graphs for households having a bequest motive (column B). The comparison of columns A and B also shows that households having a bequest motive pay more income taxes in old age, compared to those without. This results directly from the fact that the former are willing to work more and longer, and thus build up more 401(k) wealth, than are households lacking the desire to leave a bequest (see Table 1)

Finally, a clear conclusion also emerges from looking at the taxes paid if the RMD were to be eliminated (grey line). Until age 80, in all four cases, this curve is below the two curves with RMD rules. Accordingly, we conclude that eliminating RMD would lead to lower tax payments for the highest 1% of taxpayers.

Conclusions

We use a calibrated lifecycle consumption and portfolio choice framework embodying realistic institutional considerations to explore how Required Minimum Distribution rules shape retirees' patterns of saving, Social Security claiming, and decumulation from their tax-qualified retirement accounts. We evaluate an RMD requirement beginning at age 70.5, as well as raising the RMD age to 72 or 75. Last, we also evaluate the impact of abolishing the RMD completely.

We show that delaying the RMD age would have little impact during peoples' financial behavior during their worklives, including on savings and asset allocation in and outside tax-qualified retirement accounts. Additionally, Social Security claiming behavior is almost unaffected. By contrast, larger changes are seen in retirement, depending on whether the older person has a bequest motive or not. For those lacking a bequest motive, even abandoning the RMD rules would change little. But for households having a bequest motive, the former age-70.5 RMD rule was quite restrictive, since such a household would prefer to make fewer withdrawals than required and use the 401(k) plans as a tool to transfer financial wealth to the next generation. Raising the RMD age to 72 postpones account withdrawals, and defers taxes for a time. Finally, we document that if the RMD rule were to be eliminated, tax revenues would change little on average, even for households with a bequest motive. Nevertheless, eliminating RMDs would lead to lower tax payments for the highest 1% of taxpayers.

Clearly, peoples' behavior under alternative RMD rules will depend on the extent to which they desire to leave money to their heirs. This implies that financial institutions such as insurance companies and mutual funds offering retirement plans and investment advice would benefit from ascertaining their clients' bequest intentions, before advising them about RMD strategies. Our conclusions will also interest professional financial planners guiding clients as they make retirement payout choices.[11] Finally, our results can inform policymakers proposing legislation to raise and/or eliminate the RMD age. For instance in October of 2020, House Ways and Means Committee Chairman Richard Neal (D-MA) and Ranking Member Kevin Brady (R-TX) introduced the "Securing a Strong Retirement Act of 2020," boosting the RMD age to 75. The previous year, key members of the Senate Finance Committee, Sens Rob Portman (R-Ohio) and Ben Cardin (D-Md.) offered the Retirement Security and Savings Act of 2019," which would have eliminated the RMD age for retirees having retirement assets worth less than $100,000 in aggregate.[12] This latter approach, dubbed a "progressive RMD approach," would clearly mitigate the revenue impacts estimated by the Joint Committee on Taxation.

Naturally our quantitative results regarding tax revenues must be interpreted with caution, since our microeconomic lifecycle model for one generation does not take into account potential macroeconomic effects on overlapping generations. Moreover, our model does not endogenize the impact of changes in RMD rules on the labor, financial, and goods markets. Nevertheless, since individual behaviors transfer to the macroeconomic level, our results *mutatis mutandis* indicate the direction of how changing RMD rules could affect the federal budget.We also recognize that our model posits that households make rational economic decisions, even though behavioral economists show they sometimes do not. We leave this to future research, as there is no clear consensus regarding which behavioral aspects should be implemented in normative models and how. Accordingly,

[11] Moreover, in our other work (Horneff 2020b), we have identified key ways in which deferred annuities can further lower retirees' RMD payout obligations.

[12] S.1431 - Retirement Security and Savings Act of 2019, 116th Congress (2019-2020). See https://www.congress.gov/bill/116th-congress/senate-bill/1431/text#toc-HF935525E46F14165887066E18B94649A

our contribution is to simultaneously demonstrate the impact of a RMD policy change on key household behaviors including consumption, work hours, saving, labor input, and benefits claiming.

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