

Does a Realisation-Based Capital Gains Tax Lead to More Wealth Accumulation than an Accrual-based Capital Gains Tax?

Bas Jacobs
Vrije Universiteit Amsterdam

May 16, 2026
Preliminary draft, comments welcome

Abstract

Does a realisation-based capital gains tax lead to more wealth accumulation than an accrual-based capital gains tax? This paper finds that wealth accumulation remains the same under both systems as long as tax revenue does not change in each path of realised asset returns and behavioural responses are absent. However, differential taxes on safe and risky assets have an ambiguous effect on risk-taking and consumption choices. Risk-taking increases due to the standard substitution effect as risky assets are taxed at lower rates under realisation-based capital gains taxation, which yields more wealth accumulation. In addition, taxes on risky assets under realisation-based tax systems are uncertain. Taxes on risky assets may hedge against investment risk (under low risk aversion), or exacerbate investment risk (under high risk aversion). In the former (latter) case risk-taking increases further (increases less or even decreases). Consumption profiles may change as well in response to changes in portfolio returns due to tax reforms, but quantitatively these effects are found to be minor. The net effect of all behavioural effects on wealth accumulation is found to be quantitatively small. With sufficient risk aversion, wealth accumulation may even decline under a realisation-based capital gains tax. A realisation-based capital gains tax always generates welfare losses compared to an accrual-based capital gains tax, because it generates portfolio distortions, which are absent under accrual-based capital gains taxation. These distortions are substantial and can reduce lifetime consumption with multiple percentage points for large tax-rate differentials.

1 Introduction

In the Netherlands, a heated debate takes place on the merits of introducing an accrual-based capital gains tax (ACGT), as proposed by the Dutch government ([Tweede Kamer, 2025](#)). Critics argue that a realisation-based tax (RCGT) would generate more wealth accumulation than an accrual-based capital gains tax. Indeed, if one were to apply the same tax rate in an ACGT and an RCGT, then the effective tax rate on risky assets (equities) would be lower under RCGT than ACGT thanks to the lock-in effect associated with postponing realisation of capital gains ([Jacobs, 2026b](#)). As a result of lower effective tax rates, wealth accumulation would naturally be larger.

However, this comparison between RCGT and ACGT is false, because expected government revenue would be lower under RCGT than under ACGT, due to the lower effective tax rates on capital income from risky assets. For any fair comparison between an RCGT and ACGT, the tax rate on risky assets needs to adjust to make sure that government revenue is the same when comparing both tax systems.

Moreover, in the Dutch policy discussion on box 3, there has been a debate on whether interest compounding boosts wealth accumulation (‘rente-op-rente effect’) ([VNO-NCW, 2026](#)). In particular, an investor would accumulate more wealth under an RCGT than an ACGT,

because he/she can re-invest that part of the returns that would otherwise be paid in taxes.¹ Nevertheless, it remains to be shown properly that an RCGT gives more capital accumulation than an ACGT. Multiple online commentators have made Excel-sheet calculations aiming to demonstrate that an ACGT results in lower wealth accumulation than an RCGT. This article verifies whether the conclusions from such calculations are correct, once properly embedded in a standard dynamic stochastic optimal portfolio-choice model.

This article explores a Samuelson-Merton dynamic stochastic portfolio choice model with safe and risky assets to analyse wealth accumulation, portfolio choice, consumption, and expected welfare. The ACGT is modelled as a uniform tax on safe and risky assets. The RCGT is modelled as a differential tax rate on safe and risky assets, where the tax rate on risky assets is lower than the tax rate on safe assets to reflect the lock-in effect. A representative household has a life-cycle of 30 years. It derives utility from consumption and bequests (terminal wealth). The bequest motive generates a motive for wealth accumulation. In each period of the life-cycle, the household optimizes consumption and portfolio choices. The household invests in safe and risky assets, where the safe return is constant and risky asset returns are independently distributed over time and drawn from a log-normal distribution.

The model is used to compare the economic effects of *budget-neutral* reforms of uniform taxation of risky and safe assets (ACGT) to differential taxation of safe and risky assets (RCGT). For each given increase in the tax on safe assets, the tax rate on risky assets is decreased under an RCGT, so as to keep revenue exactly the same on all 10,000 simulated paths of stochastic asset returns in the Monte Carlo simulations.² This introduces an important, new feature in the analysis: tax rates on risky assets are path-dependent under RCGT. An ACGT eliminates, by construction, path-dependence in the tax burden, since the same tax rate applies irrespective of the history of realised capital returns. An RCGT, conversely, always introduces path-dependence, since the tax burden depends on the timing and magnitude of return realisations. As a result, risk in the tax system under RCGT can both decrease and increase investment risk, which, in turn, affects portfolio choices.

The main conclusion of the quantitative analysis is that wealth accumulation *does not fundamentally change* after a revenue-neutral switch to lower tax on risky than risk-free assets. In the absence of any effects on portfolio choices, there is not a visible difference between an ACGT and an RCGT on wealth accumulation and consumption. Intuitively, portfolios and tax burdens remain approximately the same, and hence also consumption choices and wealth accumulation. However, differential taxes do affect risk-taking in two distinct ways.

First, risk taking increases due to the standard substitution effect as risky assets are taxed at lower rates with an RCGT than under an ACGT. For that reason, an RCGT yields more wealth accumulation – *ceteris paribus*.

Second, taxes on risky assets under realisation-based tax systems are risky themselves. Taxes on risky assets may therefore hedge against investment risk (under low risk aversion/low volatility), or exacerbate investment risk (under high risk aversion/high volatility). In the former case, risk taking increases and in the latter case, it decreases.

If overall risk-taking increases (decreases) wealth accumulation typically increases (decreases) – *ceteris paribus*. The reason is that risk-bearing assets yield higher returns. Moreover, consumption also responds to changes in net asset returns. Typically, when investors earn higher portfolio returns, consumption will be on average higher, and consumption is also tilted more towards the future. Higher consumption lowers wealth accumulation, and tilting consumption towards the future, increases wealth accumulation.

The net effect of all behavioural effects on wealth accumulation is found to be quantitatively

¹A serious economic error is made by VNO-NCW in that future government tax revenue is not discounted under an RCGT (Gerritsen, 2026).

²Although tax revenues are stochastic, this paper does not discuss how the government should deal with higher or lower realised revenues.

minor in all simulations. Moreover, with sufficiently large risk aversion, wealth accumulation may even *decline* despite the lower tax rate on risky than safe assets. A larger portfolio share then yields such a large exposure to tax-rate risk so that investors want to reduce their optimal portfolio share in risky assets.

Finally, differential taxation of safe and risky assets generates portfolio distortions. There is always a welfare loss under differential taxation of safe and risky assets, as households overinvest in risky assets. Even though they might reap higher returns, this is outweighed in welfare terms by higher financial risk. This welfare loss can be quantitatively substantial and increases to multiple percentage points of lifetime consumption for larger tax differentials on safe and risky assets.

This article thereby confirms the conjectures made by [van den Dool et al. \(2026\)](#) that expected wealth accumulation would be the same under ACGT and RCGT for the same government revenue. This paper demonstrates that this would indeed be the case in the absence of portfolio and consumption responses to taxation. However, even if these behavioural responses are allowed for, the quantitative effects are minor. Moreover, it confirms their claim that it is not socially desirable to move to an RCGT, since the latter generates larger distortions in portfolio choices, which can be avoided with an ACGT.

This article proceeds as follows. Section 2 introduces the model. Section 3 gives the model simulations. Section 4 concludes.

2 Model

This section presents a standard Merton-Samuelson life-cycle portfolio choice model with differential taxation of income from safe and risky assets ([Merton, 1969](#); [Samuelson, 1969](#)). The model is then simulated to study how revenue-neutral changes in the tax structure affect portfolio allocation, consumption, and wealth accumulation.

2.1 Environment

Time is discrete and indexed by $t = 1, \dots, T$, where $T = 30$ denotes the end of the household's life cycle. A representative household starts life with exogenous financial wealth W_0 . To generate a motive for wealth accumulation, the household has a bequest motive and derives utility from terminal wealth.³

In each period the household allocates savings between a safe asset and a risky asset. Let $\alpha_t \in [0, 1]$ denote the share of savings invested in the risky asset; the remaining share $1 - \alpha_t$ is invested in the safe asset.

The safe asset yields a deterministic gross return $R^f \equiv 1 + r^f$, where r^f is the constant, risk-free interest rate. The risky asset yields a stochastic gross return that is independently and identically distributed across periods according to a log-normal distribution:

$$R_{t+1}^r \equiv \exp(\mu + \sigma\theta_{t+1}), \quad \theta_{t+1} \stackrel{\text{i.i.d.}}{\sim} \mathcal{N}(0, 1), \quad (1)$$

where $\mu > 0$ is the mean and $\sigma > 0$ is the standard deviation of the log return. The expected gross risky return is $\mathbb{E}[R^r] = \exp(\mu + \frac{1}{2}\sigma^2)$. A history (or path) of return-shock realisations is denoted by $\Theta \equiv \{\theta_1, \theta_2, \dots, \theta_T\}$. The i.i.d. assumption implies that asset returns carry no information about future returns, so the relevant state variable for the household's problem is financial wealth alone.

³This setup allows us to generate a motive for wealth accumulation, while preserving the homothetic structure of the value function, which considerably simplifies the simulations. Alternatively, the household may save for retirement out of time-varying labour income. The latter, however, makes the model very complicated as the homothetic structure would be lost and portfolio shares would no longer be constant and become time-varying. Simulations of the model would then require numerically solving for all value functions on each simulated path of asset returns. This exercise is complicated and left for future research.

2.2 Preferences and budget constraints

The household maximizes expected lifetime utility over consumption c_t in year t and terminal wealth W_{T+1} :

$$U \equiv \mathbb{E} \left[\sum_{t=1}^T \beta^{t-1} u(c_t) + \beta^T \eta u(W_{T+1}) \right], \quad u(c_t) \equiv \frac{c_t^{1-\gamma}}{1-\gamma}, \quad \beta \in (0, 1), \quad \gamma, \eta > 0, \quad (2)$$

where β is the discount factor, γ is the coefficient of relative risk aversion (CRRA), and η is the preference to leave a bequest. Setting $\eta = 0$ eliminates the bequest motive.

The household enters period t with financial wealth W_t . Let $A_t \equiv W_t - c_t$ denote financial resources invested after consumption. After choosing consumption c_t , the remaining resources A_t are invested in the two assets.

The household earns safe capital income $(1 - \alpha_t)A_t(R^f - 1)$ and risky capital income $\alpha_t A_t(R_{t+1}^r - 1)$. Income from the safe asset is taxed at rate τ_s , and income from the risky asset is taxed at rate τ_r . In most of what follows, the tax on risky assets is contingent on the asset return history Θ .

Taxes are proportional and allow for full loss offsets, so tax payments can be negative in states with negative risky income. The household budget constraint can thus be written as:

$$W_{t+1} = A_t \left[1 + (1 - \tau_s)(1 - \alpha_t)(R^f - 1) + (1 - \tau_r)\alpha_t(R_{t+1}^r - 1) \right]. \quad (3)$$

Define the after-tax gross return on one unit of invested wealth as

$$R_{t+1}^a \equiv 1 + (1 - \tau_s)(1 - \alpha_t)(R^f - 1) + (1 - \tau_r)\alpha_t(R_{t+1}^r - 1). \quad (4)$$

Then, the law of motion of household wealth can be written compactly as

$$W_{t+1} = A_t R_{t+1}^a. \quad (5)$$

2.3 Optimal consumption and portfolio choice

The household optimally chooses consumption c_t^* and the risky portfolio share α_t^* . This completely standard finance problem can be solved using dynamic programming. Because asset returns are identically and independently distributed, financial wealth W_t is the only state variable. The household's problem can thus be written recursively.

Let $V_t(W_t)$ denote the value function at age t and wealth level W_t . The Bellman equation is then given by:

$$V_t(W_t) = \max_{c_t, \alpha_t} \{u(c_t) + \beta \mathbb{E}_t [V_{t+1}(W_{t+1})]\}, \quad \text{s.t. } \alpha_t \in [0, 1], \quad (6)$$

with the terminal condition $V_{T+1}(W) = \eta u(W)$ for all $W \geq 0$. The household is allowed to borrow, but it cannot go short as indicated by $\alpha_t \in [0, 1]$.

Substituting the dynamic household budget constraint (5), the Bellman equation becomes:

$$V_t(W_t) = \max_{c_t, \alpha_t} \{u(c_t) + \beta \mathbb{E}_t [V_{t+1}(A_t R_{t+1}^a)]\}. \quad (7)$$

The expectation $\mathbb{E}_t[\cdot]$ is taken over the distribution of the risky return R_{t+1}^r and, in the policy experiments, over the distribution of the path-contingent tax rate τ_r . The first-order conditions associated with the Bellman equation (7) characterize the jointly optimal consumption and portfolio choice.

The interior first-order condition with respect to consumption c_t yields the following stochastic Euler equation for consumption:

$$\begin{aligned} u'(c_t) &= \beta \mathbb{E}_t [V'_{t+1}(W_{t+1})R_{t+1}^a] = \beta \mathbb{E} [u'(c_{t+1})R_{t+1}^a] \\ 1 &= \beta \mathbb{E} \left[\left(\frac{c_{t+1}}{c_t} \right)^{-\gamma} R_{t+1}^a \right], \end{aligned} \quad (8)$$

where the second step employs the envelope theorem of the Bellman equation, $V'_t(W_t) = u'(c_t)$, and CRRA utility is employed in the second line.

If the solution is interior, the first-order condition with respect to the portfolio share α_t is given by:

$$\mathbb{E}_t \left[V'_{t+1}(W_{t+1}) \frac{\partial R_{t+1}^a}{\partial \alpha_t} \right] = 0. \quad (9)$$

Since

$$\frac{\partial R_{t+1}^a}{\partial \alpha_t} = (1 - \tau_r)(R_{t+1}^r - 1) - (1 - \tau_s)(R^f - 1), \quad (10)$$

and using the envelope theorem $V'_{t+1}(W_{t+1}) = u'(c_{t+1})$, the first-order condition for optimal portfolio choice can be rewritten as:

$$\mathbb{E}_t \left[u'(c_{t+1}) \left[(1 - \tau_r)(R_{t+1}^r - 1) - (1 - \tau_s)(R^f - 1) \right] \right] = 0. \quad (11)$$

This equation determines the optimal share of risky assets α_t^* .

The last equation can be rewritten as the standard consumption-based asset pricing equation. In particular, denote the risky return as $r_{t+1}^r \equiv R_{t+1}^r - 1$, and the risk premium as $\pi_{t+1} \equiv -\frac{\text{cov}[u'(c_{t+1}), (1 - \tau_r)r_{t+1}^r]}{\mathbb{E}[u'(c_{t+1})]}$, then we find:

$$\mathbb{E}_t[(1 - \tau_r)r_{t+1}^r(\Theta)] - \pi_{t+1} = (1 - \tau_s)r^f. \quad (12)$$

Clearly, a lower tax rate on risky assets relative to the tax rate on safe assets distorts portfolio choices. The optimal share of risky assets α_t^* will then be larger.

Importantly, the risk-premium π_{t+1} does not only depend on risk in asset returns, but potentially also on risk in tax rates. In particular, the risk premium is affected if tax rate $\tau_r(\Theta)$ is stochastic and correlated with investment returns, as is the case in the policy simulations of this paper. Indeed, only if tax rates are always constant, the covariance reduces to the standard Merton–Samuelson term.

To analyse this in more detail, the risk-premium can be decomposed into risk in asset returns and risk in taxes by using (suppressing function arguments)

$$\begin{aligned} \text{cov}(u', (1 - \tau_r)r_{t+1}^r) &= \mathbb{E}[1 - \tau_r] \text{cov}(u', r_{t+1}^r) + \mathbb{E}[r_{t+1}^r] \text{cov}(u', 1 - \tau_r) \\ &\quad + \mathbb{E}[(u' - \mathbb{E}[u']) (\mathbb{E}[\tau_r] - \tau_r) (r_{t+1}^r - \mathbb{E}[r_{t+1}^r])]. \end{aligned} \quad (13)$$

Hence, the risk premium can be written as:

$$\begin{aligned} \pi_{t+1} &= \underbrace{-\frac{(1 - \bar{\tau}_r) \text{cov}(u'(c_{t+1}), r_{t+1}^r)}{\mathbb{E}[u'(c_{t+1})]}}_{\equiv \pi_{t+1}^r} + \underbrace{\frac{\bar{r}^r \text{cov}(u'(c_{t+1}), \tau_r(\Theta))}{\mathbb{E}[u'(c_{t+1})]}}_{\equiv \pi_{t+1}^\tau} \\ &\quad + \underbrace{\frac{\mathbb{E}[u'(c_{t+1}) - \mathbb{E}[u'(c_{t+1})]] \mathbb{E}[\bar{\tau}_r - \tau_r(\Theta)] \mathbb{E}[r_{t+1}^r - \bar{r}^r]}{\mathbb{E}[u'(c_{t+1})]}}_{\equiv \pi_{t+1}^{r\tau}}, \end{aligned} \quad (14)$$

where $\bar{\tau}_r \equiv \mathbb{E}[\tau_r(\Theta)]$ and $\bar{r}^r \equiv \mathbb{E}[r_{t+1}^r]$. The first term is the standard return risk premium π_{t+1}^r , which corrects for the net-of-tax rate $(1 - \bar{\tau}_r)$, since only a part of the risky return is retained by the household. It is always positive and is present under all tax systems.

The second term π_{t+1}^{τ} is the *tax-risk premium* that is equal to zero under uniform taxation (where τ_r is a constant) and arises only under path-dependent taxation (where $\tau_r(\Theta)$ is path dependent). Its sign depends on the covariance of marginal utility and the tax rate, i.e., $\text{cov}(u', \tau_r)$. Intuitively, if high marginal-utility states coincide with high-tax states, then the tax risk premium is positive. Consequently, risk-averse investors demand a larger risk premium.

The third term is an *interaction premium* $\pi_{t+1}^{\tau r}$ capturing the third-order interactions between u' , τ_r , and r_{t+1}^r within the same investment period. The interpretation is not straightforward. In general, no predictions on its sign can be provided, as it depends on complex interactions. The quantitative simulations later in this paper suggest that this term is generally negative, i.e., reducing the risk-premium.

If taxes on safe and risky assets would always be the same, i.e., $\tau_r = \tau_s$, as is the case under ACGT, then optimal risk-taking is not distorted by taxation:

$$\mathbb{E}_t[r_{t+1}^r(\Theta)] - \pi_{t+1} = r^f, \quad (15)$$

where the risk-premium is now redefined over gross returns $\pi_{t+1} \equiv -\frac{\text{cov}[u'(c_{t+1}), r_{t+1}^r]}{\mathbb{E}[u'(c_{t+1})]}$. Intuitively, the opportunity cost of taking more risk – for given portfolio size – is to give up a net safe return, which is taxed at the same rate as the benefits of taking more risk, the risk-premium on risky assets. Since benefits and costs are equally affected by the tax rate, risk-taking is not distorted.

2.4 Homotheticity of the value function

In general, the policy function for the optimal portfolio share $\alpha_t^*(W_t)$ depends on both financial wealth W_t and time t . However, the portfolio share is constant over time, since the value function is homothetic in wealth due to the absence of labour income.⁴ To show this formally, define the *expected risk-adjusted return*

$$ER \equiv \mathbb{E}[(R^a)^{1-\gamma}]. \quad (16)$$

ER summarises the distribution of after-tax returns relevant for saving and portfolio decisions under CRRA utility. The next proposition formally demonstrates that the value function is homothetic.

Proposition 1 *Assuming CRRA utility (2) and taking policy $\{\tau_s, \tau_r(\Theta)\}$ on each path Θ as given, there exist deterministic scalars $\{A_t\}_{t=1}^T$ such that the value function satisfies*

$$V_t(W_t) = A_t \frac{W_t^{1-\gamma}}{1-\gamma}, \quad \forall t = 1, \dots, T, \quad (17)$$

so that the optimal portfolio share α^* is constant across all periods and wealth levels and follows from equation (11).

Proof. We proceed by backward induction.

Base step ($t = T$). The final-period value function is $V_{T+1}(W) = \eta W^{1-\gamma}/(1-\gamma)$, which follows from equation (17) with $A_{T+1} = \eta$. Substituting into the Bellman equation at T :

$$V_T(W_T) = \max_{c_T, \alpha} \left\{ \frac{c_T^{1-\gamma}}{1-\gamma} + \beta \eta \mathbb{E} \left[\frac{(A_T R_T^a)^{1-\gamma}}{1-\gamma} \right] \right\}. \quad (18)$$

⁴An upward sloping earnings profile to allow for saving for retirement breaks the homotheticity, and the portfolio share would be declining over the life-cycle. Intuitively, the present value of human wealth at each time t declines over time. That is, the deterministic present value of remaining lifetime labour earnings H_t declines over time. Human wealth is economically equivalent to holding an amount of safe assets. Hence, younger households have a large exposure to the safe asset through their human capital. They optimally tilt their financial portfolio towards equities. As the household ages, the optimal portfolio share falls over the working life.

Since R_T^a does not depend on W_T , the portfolio FOC (11) pins down α^* independently of W_T . Factoring $A_T^{1-\gamma}$ out yields:

$$V_T(W_T) = \max_{c_T} \left\{ \frac{c_T^{1-\gamma}}{1-\gamma} + \beta\eta ER \frac{(W_T - c_T)^{1-\gamma}}{1-\gamma} \right\}, \quad (19)$$

where $ER = \mathbb{E}[(R_T^a)^{1-\gamma}]$ evaluated at the optimal α^* . The FOC for c_T is

$$c_T^{-\gamma} = \beta\eta ER (W_T - c_T)^{-\gamma}. \quad (20)$$

Setting $\psi_T \equiv c_T/(W_T - c_T) = c_T/A_T$ and rearranging gives:

$$\psi_T = (\beta\eta ER)^{-1/\gamma}. \quad (21)$$

Using $c_T + A_T = W_T$:

$$c_T = m_T W_T, \quad m_T = \frac{\psi_T}{1 + \psi_T}. \quad (22)$$

The optimized value function at T is therefore

$$\begin{aligned} V_T(W_T) &= \frac{(m_T W_T)^{1-\gamma}}{1-\gamma} + \beta\eta ER \frac{((1 - m_T)W_T)^{1-\gamma}}{1-\gamma} \\ &= \underbrace{\left[m_T^{1-\gamma} + \beta\eta ER (1 - m_T)^{1-\gamma} \right]}_{A_T} \frac{W_T^{1-\gamma}}{1-\gamma}, \end{aligned} \quad (23)$$

which is homothetic in W_T .

Inductive step. Suppose $V_{t+1}(W) = A_{t+1} W^{1-\gamma}/(1-\gamma)$ for some $A_{t+1} > 0$. Then:

$$\mathbb{E}_t [V_{t+1}(A_t c)] = A_{t+1} \frac{A_t^{1-\gamma}}{1-\gamma} \mathbb{E} [(R_T^a)^{1-\gamma}] = A_{t+1} ER \frac{A_t^{1-\gamma}}{1-\gamma}. \quad (24)$$

The portfolio FOC (11) becomes

$$\mathbb{E} \left[(R_T^a)^{-\gamma} ((1 - \tau_r)(R^r - 1) - (1 - \tau_s)(R^f - 1)) \right] = 0, \quad (25)$$

which is independent of t , W_t , and A_{t+1} . Hence the optimal portfolio share α^* is the same in every period and at every wealth level (the Merton–Samuelson result). Define $B_t \equiv \beta A_{t+1} ER$. The Bellman equation at t reduces to

$$V_t(W_t) = \max_{c_t} \left\{ \frac{c_t^{1-\gamma}}{1-\gamma} + B_t \frac{(W_t - c_t)^{1-\gamma}}{1-\gamma} \right\}. \quad (26)$$

The FOC for c_t gives

$$c_t^{-\gamma} = B_t (W_t - c_t)^{-\gamma}, \quad (27)$$

so $c_t/A_t = B_t^{-1/\gamma}$ and

$$m_t = \frac{1}{1 + B_t^{1/\gamma}}. \quad (28)$$

Substituting back:

$$V_t(W_t) = \underbrace{\left[m_t^{1-\gamma} + B_t (1 - m_t)^{1-\gamma} \right]}_{A_t} \frac{W_t^{1-\gamma}}{1-\gamma}, \quad (29)$$

which preserves the homothetic form. By induction, (17) holds for all $t = 1, \dots, T$, and α^* is constant throughout. ■

Proposition 1 immediately delivers an exact, closed-form solution for the optimal consumption policy rule as Corollary 1 demonstrates.

Corollary 1 (Exact MPC recursion) *The optimal consumption policy is $c_t = m_t W_t$ for all t , where the optimal marginal propensity to consume m_t satisfies the exact backward recursion*

$$B_t = \beta A_{t+1} ER, \quad m_t = \frac{1}{1 + B_t^{1/\gamma}}, \quad (30)$$

$$A_t = m_t^{1-\gamma} + B_t (1 - m_t)^{1-\gamma}, \quad (31)$$

for $t = T - 1, T - 2, \dots, 1$, with terminal condition

$$\psi_T = (\beta \eta ER)^{-1/\gamma}, \quad m_T = \frac{\psi_T}{1 + \psi_T}, \quad A_T = m_T^{1-\gamma} + \beta \eta ER (1 - m_T)^{1-\gamma}. \quad (32)$$

When $\eta = 0$ (no bequest), $\psi_T \rightarrow \infty$ and $m_T = 1$, $A_T = 1$: the household consumes all remaining wealth in the last period.

Proof. Equations (30)–(31) follow directly from the inductive step in the proof of Proposition 1. The terminal condition (32) follows from the base step. ■

$ER = \mathbb{E}[(R^a)^{1-\gamma}]$ enters the recursion because it is the only moment of the return distribution that is relevant for the saving decision under CRRA utility. The recursion (30)–(31) is identical to Samuelson (1969) and Merton (1969), which is extended to allow for taxes and a bequest motive.

The time-invariant portfolio share α^* is characterised by the exact first-order condition (11). A closed-form approximation for the optimal portfolio share can be obtained if capital income taxes are uniform: $\tau_s = \tau_r = \bar{\tau}$. In particular, with equal taxes $(1 - \bar{\tau})$ cancels out, reducing the optimality condition for α^* to

$$\mathbb{E}\left[(R^a)^{-\gamma}(R^r - R^f)\right] = 0, \quad (33)$$

where $R^a = 1 + (1 - \bar{\tau})[(1 - \alpha)(R^f - 1) + \alpha(R^r - 1)]$. Expanding (33) to first order in α around $\alpha = 0$, using $\log R^r \sim \mathcal{N}(\mu, \sigma^2)$ and the approximation $\mathbb{E}[R^r - R^f] \approx \mu - r_f + \frac{1}{2}\sigma^2$ for small $r_f \equiv \log R^f$ and σ , yields

$$\alpha^* \approx \frac{\mu - r_f + \frac{1}{2}\sigma^2}{\gamma(1 - \bar{\tau})\sigma^2}. \quad (34)$$

This is the Merton-Samuelson formula adjusted for uniform taxes on safe and risky assets. The numerator $\mu - r_f + \frac{1}{2}\sigma^2 = \log(\mathbb{E}[R^r]/R^f)$ is the Jensen-corrected log excess return. The $(1 - \bar{\tau})$ in the denominator reflects the variance-reducing effect of taxes on capital income on the net, after-tax risky return: taxes on capital income reduce the variance in after-tax returns by $(1 - \bar{\tau})^2$, while reducing the excess return only by $(1 - \bar{\tau})$, so the net effect raises the optimal portfolio share relative to the no-tax benchmark $\alpha_0^* = (\mu - r_f + \frac{1}{2}\sigma^2)/(\gamma\sigma^2)$.⁵

2.5 Government revenue and revenue-neutral tax reforms

In all policy experiments, the government raises revenue by taxing safe and risky capital incomes. The simulations compare various tax systems that yield the same revenue on each path Θ of realised capital returns.

Importantly, all financial risk is aggregate risk in this model. Hence, the government cannot insure these financial risks by pooling risks across paths of capital returns. Indeed, if risk were fully idiosyncratic, one could pool these risks at the level of the government and one would obtain deterministic government revenues. However, if risk is aggregate, the intertemporal government budget constraint must hold on every simulated path Θ of capital returns.

⁵For the baseline calibration ($\mu = 0.07$, $\sigma = 0.18$, $r_f \approx 0.0198$, $\gamma = 5$, $\bar{\tau} = 0.36$), formula (34) gives $\alpha^* \approx 0.640$, against an exact numerical solution of 0.639 – an approximation error of less than 0.2 percentage points.

A more general model would also specify how the government responds to revenue risk, e.g. through adjustments to other taxes, through spending cuts, or through borrowing. This raises a host of issues as earlier literature has shown, see e.g., [Kaplow \(1994\)](#) and [Schindler \(2008\)](#). If such future tax adjustments are anticipated, an ACGT also exposes the household to some form of fiscal risk. The model sidesteps this issue by treating revenue as exogenous in all tax regimes, across all paths of return realisations. This can be seen as a standard partial-equilibrium assumption. Moreover, it is internally consistent. The RCGT is revenue-neutral on every path precisely to prevent any cross-path redistribution by the government. Hence, the government is not able to pool aggregate risks.

The present value of tax revenue $\mathcal{R}(\tau_r(\Theta), \tau_s, \Theta)$ on each path of asset returns Θ is thus defined as:

$$\mathcal{R}(\tau_r(\Theta), \tau_s, \Theta) \equiv \sum_{t=1}^T \frac{T_t^s(\Theta) + T_t^r(\Theta)}{(R^f)^{t-1}}, \quad \forall \Theta, \quad (35)$$

where risky and safe tax revenues for each Θ are given by:

$$T_t^s(\Theta) \equiv \tau_s(1 - \alpha)A_t(\Theta)(R^f - 1), \quad (36)$$

$$T_t^r(\Theta) \equiv \tau_r(\Theta)\alpha A_t(\Theta)(R_{t+1}^r(\Theta) - 1). \quad (37)$$

As a benchmark, define the uniform-tax system, which taxes safe and risky assets symmetrically at 36 percent at all dates and in all states: $\tau_s = \tau_r = 0.36$. This tax system corresponds to an ACGT. 36 percent is the statutory rate in box 3 of the current Dutch tax system, where portfolio investments are taxed. The revenue target in each policy experiment is equal to the present value of tax revenues under uniform tax rates (ACGT):

$$\mathcal{R}(\tau_s = \tau_r; \Theta) \equiv \sum_{t=1}^T \frac{T_t^s(\Theta) + T_t^r(\Theta)}{(R^f)^{t-1}} \Big|_{\tau_s = \tau_r = 0.36}, \quad \forall \Theta. \quad (38)$$

All tax revenue is discounted by the safe rate of return. This warrants an explanation. If tax revenue is risky, then the stochastic pricing kernel or a risk-adjusted discount rate should be used to discount all uncertain future revenues from taxing risky assets. However, in the policy experiments of this model, tax revenue on each path of realised returns is certain. Indeed, the tax rate on risky assets is stochastic to fix tax revenue on the given, path-dependent revenue target. Hence, the safe rate is used to discount government revenue.

The quantitative analysis considers a set of alternative tax systems that emulate an RCGT by reducing the tax rate on risky assets below the tax rate on safe assets. In particular, the tax rate on safe assets is fixed exogenously at $\tau_s \in \mathcal{T} \equiv \{0.36, 0.41, 0.46, 0.51, 0.56, 0.61, 0.66\}$. This grid is sufficiently wide to capture all reasonable differences in effective tax rates on safe and risky assets that are practically feasible. [Jacobs \(2026a\)](#) shows that effective tax rate differentials on safe and risky assets are generally below 30 percentage points for empirically reasonable returns on stocks and for very long holding periods (up to 30 years). The path-contingent tax rate on risky assets $\tau_r(\Theta)$ is computed residually, so that the present value of revenue on each simulated path Θ remains the same as in the baseline tax system with uniform taxes:⁶

$$\mathcal{R}(\tau_s, \tau_r(\Theta); \Theta) = \mathcal{R}(\tau_s = \tau_r; \Theta), \quad \forall \Theta. \quad (39)$$

Since the residual rate $\tau_r(\Theta)$ is pinned down path-by-path to close the government budget, it is path-contingent: it takes a different value on every realisation of the stochastic return sequence.

The specification of the government budget constraint avoids introducing money machines as in [VNO-NCW \(2026\)](#). Future tax revenues are discounted at the safe rate. Moreover, it avoids

⁶For some paths Θ , no feasible $\tau_r(\Theta) \in [-1, 1]$ may exist that meets the revenue target. These cases are treated as infeasible in the simulations.

unfair comparisons between ACGT and RCGT because tax revenue is kept the same, i.e., tax burdens remain constant, across policy scenarios.

This specification of the government budget constraint is conceptually different from other analyses of taxation and risk taking with aggregate risk and state-contingent taxes on risky assets. For example, [Gordon \(1985\)](#) and [Kaplow \(1994\)](#) show that, if taxes are state contingent, and all stochastic government revenue is returned to the household, then taxation does not affect risk-taking. Indeed, a tax on risky asset returns yields a constant amount of revenue (possibly zero) regardless of the state of the world. A state-contingent tax on risky assets, then acts like a non-distortionary lump-sum tax. This is not the case in this model. The reason is that the net present value of tax revenues *differs* for each simulated path Θ depending on the realisation of capital returns. Hence, even though the tax rate on risky assets is state-contingent, it does not make sure that the same amount of revenue (possibly zero) is raised for each realised path of capital returns. It only ensures that, on each path, the same amount of revenue is raised as in a tax system with uniform taxes.

2.6 Equilibrium

To find the model's equilibrium requires careful treatment. On the one hand, household choices for consumption and portfolio shares are determined by rational expectations over taxes on risky assets on each path of return realisations. On the other hand, the government budget constraint should hold for all model paths, which again depend on household choices. The model's equilibrium definition thus requires that household expectations of risky tax rates and the government budget constraint be mutually consistent. The following definition formalises the equilibrium concept.

Definition 1 (Equilibrium) *An equilibrium for a given safe tax rate τ_s is a triple $\{\alpha^*, \{m_t^*\}_{t=1}^T, \tau_r^*(\Theta)\}$ for all Θ such that:*

1. **Optimality.** *Given the distribution of path-dependent tax rates on risky assets $\{\tau_r^*(\Theta)\}$, α^* solves the portfolio FOC (11) and $\{m_t^*\}$ satisfies the MPC recursion (31)–(32).*
2. **Path-dependent budget balance.** *For every realised path Θ , revenue with differential capital taxes is the same as revenue under uniform taxes:*

$$\mathcal{R}(\tau_s, \tau_r^*(\Theta); \Theta) = \mathcal{R}(\tau_s = \tau_r; \Theta). \quad (40)$$

3. **Expectations consistency.** *The expectation ER is evaluated under optimal choices and equilibrium taxes: $(\alpha^*, \tau_s, \{\tau_r^*(\Theta)\})$.*

To analyse the underlying reasons why wealth accumulation changes in response to tax policy, the following statistics are calculated: the expected after-tax portfolio return ($\mathbb{E}[R_{t+1}^a]$), and the *certainty equivalent* of portfolio returns ($R^{CE} \equiv (\mathbb{E}[R^{1-\gamma}])^{1/(1-\gamma)}$).

2.7 Welfare measurement

Finally, the change in welfare is computed for each tax policy change. In particular, the simulations calculate the percentage change in expected lifetime consumption under differential taxation that would yield the same welfare as in the baseline with uniform taxation.

For each pair of taxes $\{\tau_s, \mathbb{E}[\tau_r(\Theta)]\}$, social welfare $U(\tau_s, \mathbb{E}[\tau_r(\Theta)])$ is calculated using expected lifetime utility. Welfare effects associated with each pair of (expected) risky and safe taxes are computed using the consumption-equivalent variation $CEV(\tau_s, \mathbb{E}[\tau_r(\Theta)])$ relative to the baseline with equal taxes on risky and safe assets:

$$CEV(\tau_s, \mathbb{E}[\tau_r(\Theta)]) = \left(\frac{U(\tau_s, \mathbb{E}[\tau_r(\Theta)])}{U(\tau_s = \tau_r)} \right)^{\frac{1}{1-\gamma}} - 1, \quad (41)$$

where $U(\tau_s = \tau_r)$ is utility in the baseline scenario with equal taxes on safe and risky assets.

The CEV measures how much consumption would need to change in the baseline scenario to make the household indifferent to implementing a policy of differentiated tax rates. A positive CEV indicates a welfare gain.

2.8 Simulation algorithm

This section summarises the numerical algorithm to simulate the model.⁷ The equilibrium of Definition 1 is computed by a damped fixed-point iteration over the tax vector $\boldsymbol{\tau}_r = (\tau_r(\Theta_1), \dots, \tau_r(\Theta_M)) \in \mathbb{R}^M$ for each RCGT scenario, where $M = 10,000$ Monte Carlo paths are used. The algorithm can be summarised as follows.

Pre-computation (baseline).

1. Draw $M \times T$ standard normal shocks and construct the lognormal return matrix $R_{t+1}^r(\Theta)$ for all paths Θ and periods t .
2. Solve for the equilibrium under uniform taxation: find α^* from the portfolio FOC (11) at $\tau_s = \tau_r = \bar{\tau}$, compute the MPC sequence $\{m_t\}$ from (31)–(32), and simulate M life-cycle paths forward using equation (5).
3. For each path Θ , record the baseline revenue target $\mathcal{R}(\tau_s = \tau_r; \Theta)$.

Fixed-point iteration (each policy scenario).

1. *Initialize tax rate on risky assets.* Given a safe tax rate τ_s , compute a uniform starting value for $\tau_r^{(0)}$ by bisection on the expected tax revenue $\mathbb{E}[\mathcal{R}(\tau_s, \tau_r; \Theta)] - \mathbb{E}[\mathcal{R}(\tau_s = \tau_r; \Theta)] = 0$, treating τ_r as constant across paths. Set $\boldsymbol{\tau}_r^{(0)} = \tau_r^{(0)} \mathbf{1}_M$.
2. *Portfolio and MPC update.* Given $\boldsymbol{\tau}_r^{(k)}$, solve the portfolio FOC (25) for $\alpha^{(k)}$ and compute the MPC sequence $\{m_t^{(k)}\}$ from (31)–(32), where

$$ER^{(k)} = \frac{1}{M} \sum_{\Theta=1}^M \frac{1}{T} \sum_{t=1}^T \left(R_t^a(\alpha^{(k)}, \tau_s, \tau_r^{(k)}(\Theta)) \right)^{1-\gamma}. \quad (42)$$

3. *Path-level bisection.* For each path $\Theta = 1, \dots, M$, holding $(\alpha^{(k)}, \{m_t^{(k)}\})$ fixed, find $\tilde{\tau}_r(\Theta) \in [-1, 1]$ by bisection on

$$\mathcal{R}(\tau_s, \tilde{\tau}_r(\Theta); \Theta) - \mathcal{R}(\tau_s = \tau_r; \Theta) = 0. \quad (43)$$

A 40-point coarse grid over $[-1, 1]$ is first scanned to locate all sign-change brackets (the gap function can be non-monotone on high-return paths). Bisection then resolves the root within the bracket closest to $\tau_r^{(k)}(\Theta)$ to within a bracket width of 10^{-10} . If no sign change is found, the path is declared infeasible and assigned the grid point with the smallest absolute gap.

4. *Damped update.* Set

$$\tau_r^{(k+1)}(\Theta) = \lambda \tilde{\tau}_r(\Theta) + (1 - \lambda) \tau_r^{(k)}(\Theta), \quad \lambda = 0.5. \quad (44)$$

5. *Convergence check.* Stop when $\max_{\Theta} |\tilde{\tau}_r(\Theta) - \tau_r^{(k+1)}(\Theta)| < 10^{-6}$.

⁷The appendix describes in detail the Matlab code to simulate the model. All codes are available upon request from the author.

Final consistency pass

After convergence to τ_r^* , α^* and $\{m_t^*\}$ are re-computed for τ_r^* . The path bisection (step 3) is then run once more under this final $(\alpha^*, \{m_t^*\})$ to ensure exact consistency between taxes and the final policy functions before the forward simulation is run. This eliminates any residual mismatch from the last inner iteration.

Budget diagnostics

An ex-post check verifies that $|\mathcal{R}(\tau_s, \tau_r^*(\Theta); \Theta) - \mathcal{R}(\tau_s = \tau_r; \Theta)| \leq 10^{-4}$ for each path Θ . Paths on which no root exists in $[-1, 1]$ are flagged as *infeasible*: these are paths on which risky capital income is so deeply negative (severe return shortfalls) that even a 100% rebate on risky losses cannot recover enough revenue to offset the higher tax on safe assets. The fraction of such paths is reported separately and grows with τ_s , as expected.

2.9 Calibration parameters

Table 1 summarises all calibration parameters. The model assumes that the life-cycle lasts 30 periods ($T = 30$). In the baseline, capital income taxes are uniform and set at 36%.

Preference parameters are standard in the portfolio literature. The coefficient of relative risk aversion is set at $\gamma = 5$. The bequest parameter is set at $\eta = 1000$.

The risk-free interest rate is set at $r = 0.02$ annually. The log of risky returns follows a normal distribution with mean $\mu = 0.07$ and standard deviation $\sigma = 0.18$: $R_{t+1}^r = \exp(\mu + \sigma\theta_{t+1})$, where $\theta_{t+1} \sim \mathcal{N}(0, 1)$. These numbers correspond quite closely to historical averages of the stock returns and their volatility in the AEX Index of the Amsterdam stock exchange. The stochastic return process for the risky asset is simulated using Monte Carlo methods. 10,000 independent return histories are generated in each simulation. Initial wealth is normalised to 1.

Table 1: Simulation parameters

		Value	Source / Notes
β	Discount factor	0.96	Standard
γ	CRRA coefficient	5	Standard
η	Bequest parameter	1000	Calibrated
T	Number of periods	30	
W_0	Initial wealth (normalisation)	1.0	Scale-free
r_f	Safe return	0.02	
μ	Log-mean of risky return	0.07	AEX calibration
σ	Log-std of risky return	0.18	AEX calibration
$\mathbb{E}[R^r]$	Expected gross risky return	1.089	Lognormal
M	Number of simulated paths	10,000	

Given $\{\tau_s, \tau_r(\Theta)\}$ and the time-invariant optimal portfolio share α^* , the wealth dynamics are simulated forward on each path Θ :

$$W_{t+1}(\Theta) = A_t(\Theta) + (1 - \tau_s)(1 - \alpha^*)A_t(\Theta)(R^f - 1) + (1 - \tau_r(\Theta))\alpha^*A_t(\Theta)(R_{t+1}^r(\Theta) - 1). \quad (45)$$

Expected wealth paths are computed by averaging across simulated histories:

$$\mathbb{E}[W_t] = \frac{1}{M} \sum_{\Theta=1}^M W(\Theta). \quad (46)$$

Figure 1: Expected taxes on risky assets for given taxes on safe assets

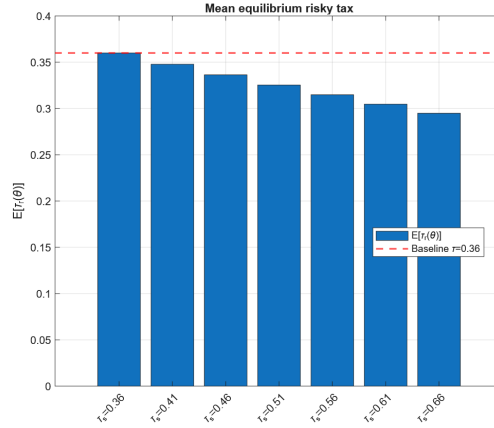
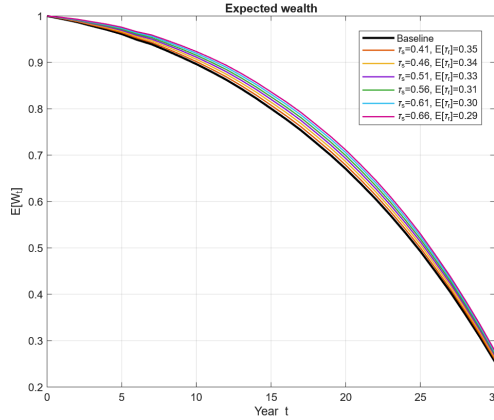


Figure 2: Expected wealth paths



Similarly, expected paths of consumption are computed by using $m_t = [1 + (\beta A_{t+1} ER)^{1/\gamma}]^{-1}$ and $c_t = m_t W_t$ and averaging across simulated histories:

$$\mathbb{E}[c_t] = \frac{1}{M} \sum_{\Theta=1}^M c_t(\Theta). \quad (47)$$

Figure 1 plots the expected taxes on risky assets for each simulation. Clearly, when the safe rate is increased, the expected tax on risky assets goes down.

3 Simulation outcomes

Figure 2 plots the expected wealth paths under different tax treatments of safe and risky assets. Wealth paths are generally declining over the life-cycle. Terminal wealth is positive, since there are bequests.

From Figure 2 follows the main conclusion of this article: expected wealth accumulation is fundamentally the same for higher/lower levels of taxation of safe/risky returns.

The intuition is threefold. First, when taxes are raised on safe assets, and, thus, decreased on risky assets to maintain revenue neutrality, the household ultimately pays the same taxes for each

history of return realisations. Figure 10 shows that wealth accumulation would basically remain the same if there would be no behavioural responses in portfolio and consumption choices. This figure is derived under the assumption that both the portfolio share and the marginal propensity to consume are held fixed at their baseline values ($\alpha_{\text{base}}, \{m_t^{\text{base}}\}$), while the tax structure changes to $\{\tau_s, \tau_r(\Theta)\}$ to raise exactly the same revenue on every simulated path. One might, then, conjecture that the entire difference between policy scenarios, in both wealth accumulation and welfare, originates solely from behavioural responses in portfolio and consumption choices.

This conjecture is, indeed, correct to an approximation. With fixed α_{base} , the period- t after-tax gross return on path Θ under differential taxation is

$$R_t^a(\Theta) = R_{t,\text{base}}^a + (\bar{\tau} - \tau_s)(1 - \alpha_{\text{base}})(R^f - 1) + (\bar{\tau} - \tau_r^*(\Theta)) \alpha_{\text{base}}(R_t^r - 1), \quad (48)$$

where $R_{t,\text{base}}^a = 1 + (1 - \bar{\tau})[(1 - \alpha_{\text{base}})(R^f - 1) + \alpha_{\text{base}}(R_t^r - 1)]$ is the baseline after-tax return with uniform taxation ($\bar{\tau} = \tau_s = \tau_r$). The second term in equation (48) is negative if $\tau_s > \bar{\tau}$ (safe income is taxed more heavily), while the third term is positive on good paths where $\tau_r^*(\Theta) < \bar{\tau}$ and the period return is favourable. Revenue neutrality on path Θ requires that the present value of these two deviations sums to zero:

$$\sum_{t=1}^T \frac{A_t(\Theta)}{(R^f)^{t-1}} \left[(\tau_s - \bar{\tau})(1 - \alpha_{\text{base}})(R^f - 1) + (\tau_r^*(\Theta) - \bar{\tau}) \alpha_{\text{base}}(R_t^r - 1) \right] = 0. \quad (49)$$

Taking expectations over paths and periods and using the law of iterated expectations, the average deviation in R_t^a is approximately zero: $\mathbb{E}[R_t^a(\Theta)] \approx \mathbb{E}[R_{t,\text{base}}^a]$. Since wealth evolves as $W_{t+1} = (1 - m_t^{\text{base}})W_t R_t^a$, the expected per-period growth rate is approximately unchanged, and consequently expected wealth is the same for all t . The conjecture is therefore approximately correct for expected wealth and consumption paths.⁸ However, behavioural responses cannot be ignored, which explains why the wealth and consumption paths under differential taxation differ from the baseline.

Second, the investor raises the share of risky assets in the portfolio, as Figure 3 shows. If τ_s is raised, the after-tax safe return $(1 - \tau_s)r^f$ increases, making the risky asset relatively more attractive. However, in our framework tax rates are also risky, which affects the risk premium, and thereby the optimal portfolio share.

Figure 4 gives the decomposition of the risk premium into the standard risk premium (π^r), the tax-risk premium because tax rates are uncertain (π^τ) and the interaction premium because risks in returns and taxes interact ($\pi^{r\tau}$) – see also equation (14).

For the baseline level of risk aversion ($\gamma = 5$), the sign of $\text{cov}(u', \tau_r)$ is negative, hence tax uncertainty acts as a *hedge* to risky asset returns. Intuitively, on paths with on average low realisations of asset returns, consumption is low so marginal utility u' is high. Hence, on such bad paths the tax rate $\tau_r(\Theta)$ is also high, since a large tax rate on risky assets is required to

⁸The conjecture fails to hold exactly for two distinct reasons. First, revenue neutrality is a *present-value* constraint on each path, not a period-by-period constraint. Even on a given path Θ with a fixed $\tau_r^*(\Theta)$, the per-period deviation in R_t^a need not be zero in any individual period. Safe income bears a higher tax in every period (since $\tau_s > \bar{\tau}$), while the offsetting risky tax relief depends on the realised return R_t^r and is therefore not a constant. When $R_t^r > 1$ the risky benefit materializes and partly offsets the safe loss; when $R_t^r < 1$ both effects reduce the after-tax return relative to the baseline. These per-period deviations average out in present value across all T periods, but they do not average out within each period, and deviations in early periods reduce the wealth available for compounding in later periods.

Second, the product structure of wealth accumulation means that the expected product of returns exceeds the product of expected returns through Jensen's inequality: $\mathbb{E}[\prod_t R_t^a] \neq \prod_t \mathbb{E}[R_t^a]$. Even if the expected per-period deviation is zero at every t separately, the variance introduced by the correlation between $\tau_r^*(\Theta)$ and R_t^r generates a second-order gap between the two wealth paths when compounding over $T = 30$ periods.

Quantitatively, the simulations confirm that these timing and compounding effects are very small, but not completely negligible. At $\tau_s = 0.56$ expected terminal wealth under the no-behavioural-response counterfactual deviates from the baseline by less than one percent. At $\tau_s = 0.96$ the deviation reaches approximately two percent.

Figure 3: Portfolio shares

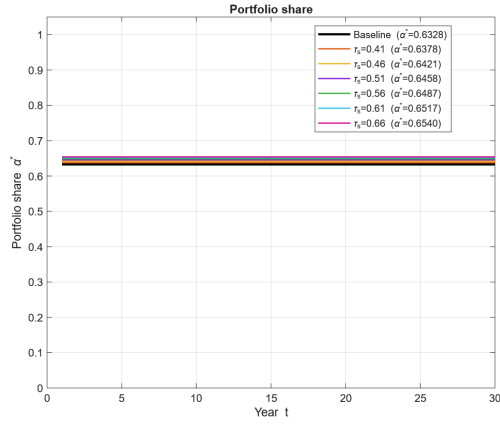


Figure 4: Decomposition of the risk premium

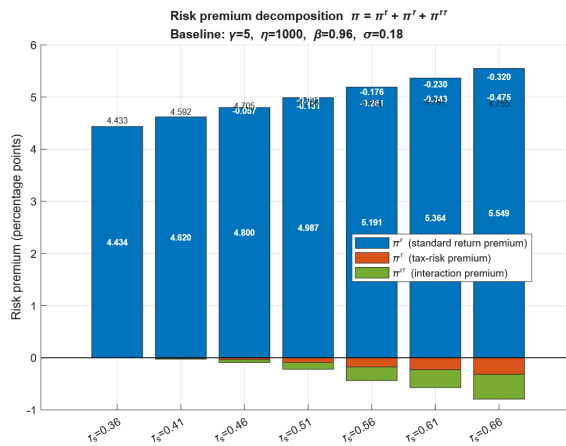


Figure 5: Expected portfolio returns

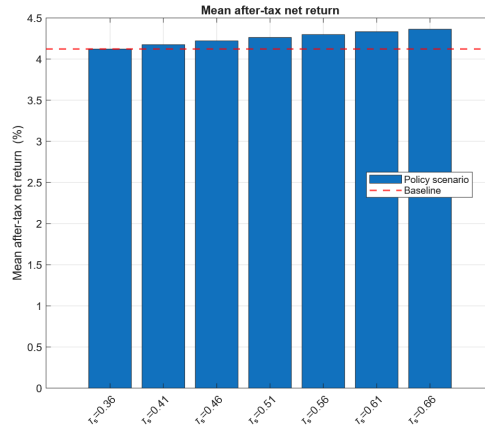
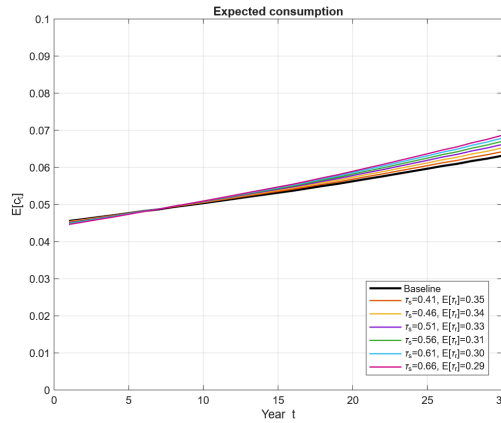


Figure 6: Expected consumption paths

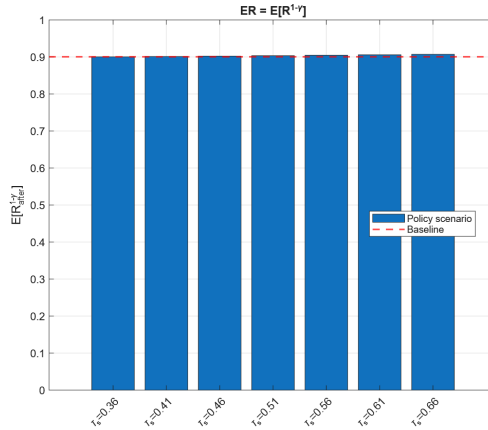


meet the revenue target when risky asset returns are low on that path. Given that the household has perfect loss-offsets, it now receives partial insurance precisely when it needs it most. The path-contingent tax rate on risky assets *reduces* the required risk premium relative to a constant tax rate. As a result, at the baseline ($\gamma = 5$), both the standard substitution effect and the lower tax risk-premium push the optimal portfolio share α^* upward under differential taxation.

Third, differential taxation of safe and risky assets gives behavioural changes in consumption and bequests. This is shown in Figure 6, which plots the expected consumption profiles. Expected consumption profiles slightly tilt towards the future. The driving force behind the rotation of the consumption profile is the change in ER , which is plotted in Figure 7. With differential taxation of asset returns, ER increases because households raise their portfolio share in risky assets. Hence, the price of current consumption in terms of future consumption increases. Moreover, consumption increases as a result of higher investment returns on portfolios. However, larger consumption typically *lowers* wealth accumulation. All effects together largely cancel out as the differences in wealth accumulation paths are very close across very different policy scenarios.

Furthermore, it would be incorrect to conclude that more consumption and wealth accumulation are desirable in welfare terms. Figure 8 plots the compensating variations of policies with differentiated tax rates. Moreover, the figure splits the difference in portfolio and consumption

Figure 7: Expected risk-adjusted returns



distortions. Clearly, portfolio distortions are the most dominant driver of welfare losses under differential taxation. The reason is mainly that portfolio choices are distorted. A tax system with lower rates on risky investment gives incentives to investors to invest more than the socially optimal amount in risky assets. Higher expected consumption raises welfare, but higher risk in consumption lowers welfare, and the latter effect dominates if risky assets are taxed at lower rates than safe assets. This is illustrated in Figure 9, which plots the *certainty equivalent* of portfolio returns. The certainty equivalent of portfolio returns is calculated as $R^{CE} = (\mathbb{E}[R^{1-\gamma}])^{1/(1-\gamma)}$. The certainty equivalent of investment returns monotonically decreases with tax rate differentiation. Corrected for risk, the investor loses from overinvesting in risky assets. Further, the consumption profile tilts because $ER \equiv \mathbb{E}[R^{1-\gamma}]$ slightly increases. The effect is tiny, however. Hence, the marginal propensity to consume out of wealth therefore increases a bit over the lifecycle – see, again, the consumption profiles. The contribution of consumption distortions to the total welfare losses is, nevertheless, nearly negligible. Therefore, the welfare losses of tax differentiation of safe and risky assets are nearly exclusively driven by portfolio distortions. These become very large and easily approach multiple percentage points of lifetime consumption at higher levels of tax-rate differentiation on safe and risky assets.

To conclude, our baseline results imply that it is not correct to presume that wealth accumulation will increase under a realisation-based capital gains tax. Moreover, it demonstrates that social welfare can be seriously reduced.

3.1 Robustness checks

This subsection discusses the robustness of the model simulations with respect to changes in risk aversion γ , volatility in investment returns σ , discount rates β , and bequest preferences η . The risk aversion parameter and the volatility parameter are most crucial for the model simulations. It should be noted that robustness checks for initial wealth are superfluous, since all model outcomes are proportionately related to or independent of initial wealth.

3.1.1 Risk aversion γ

Figure 11 shows the simulation outcomes for $\gamma = 3$ and $\gamma = 10$. The outcomes for $\gamma = 3$ show that risk aversion is so low that investors choose a corner solution in which they invest all their wealth in risky assets. Consequently, welfare losses of differential taxes are absent. If individuals choose a corner, behavioural responses in portfolio choice are absent. The path of expected wealth is indistinguishable under uniform and differential taxation. Moreover, consumption

Figure 8: Compensating variations

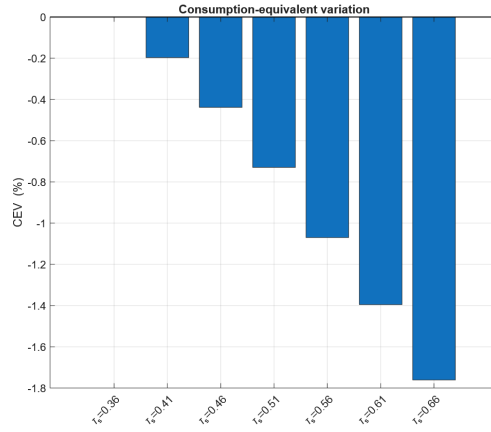


Figure 9: Certainty equivalent expected returns

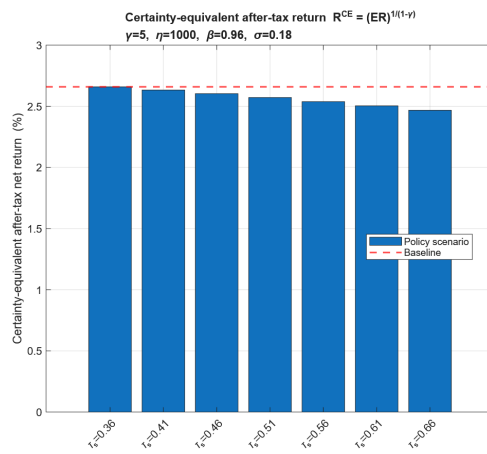


Figure 10: Exogenous portfolio choice and marginal propensity to consume

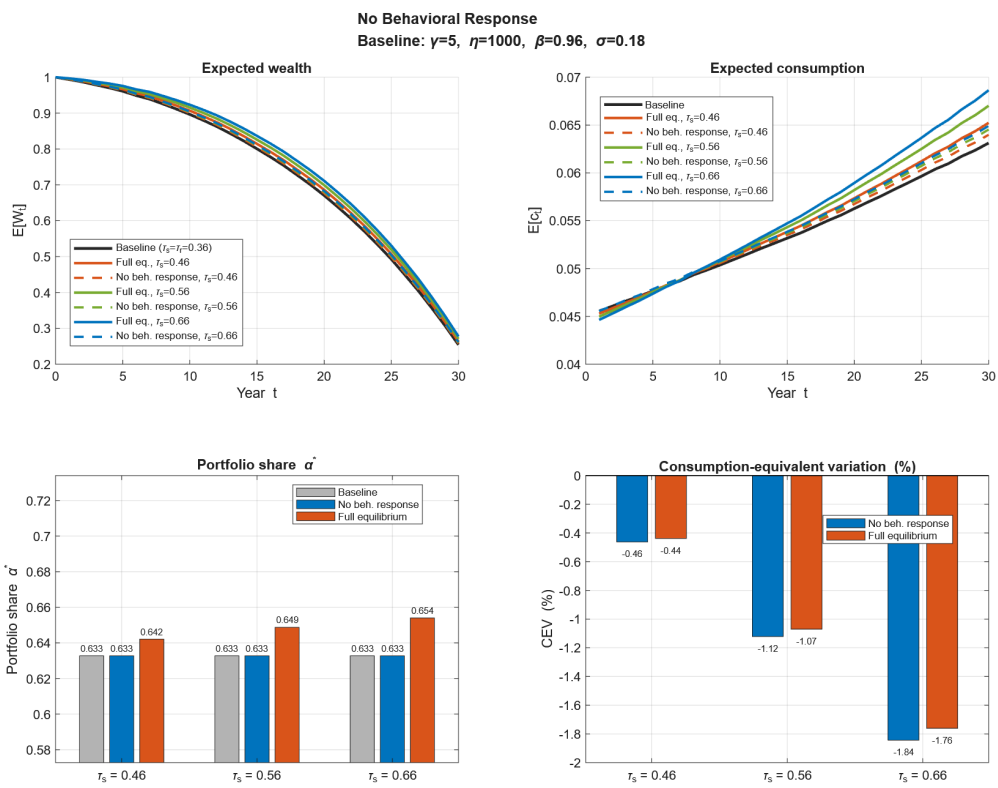
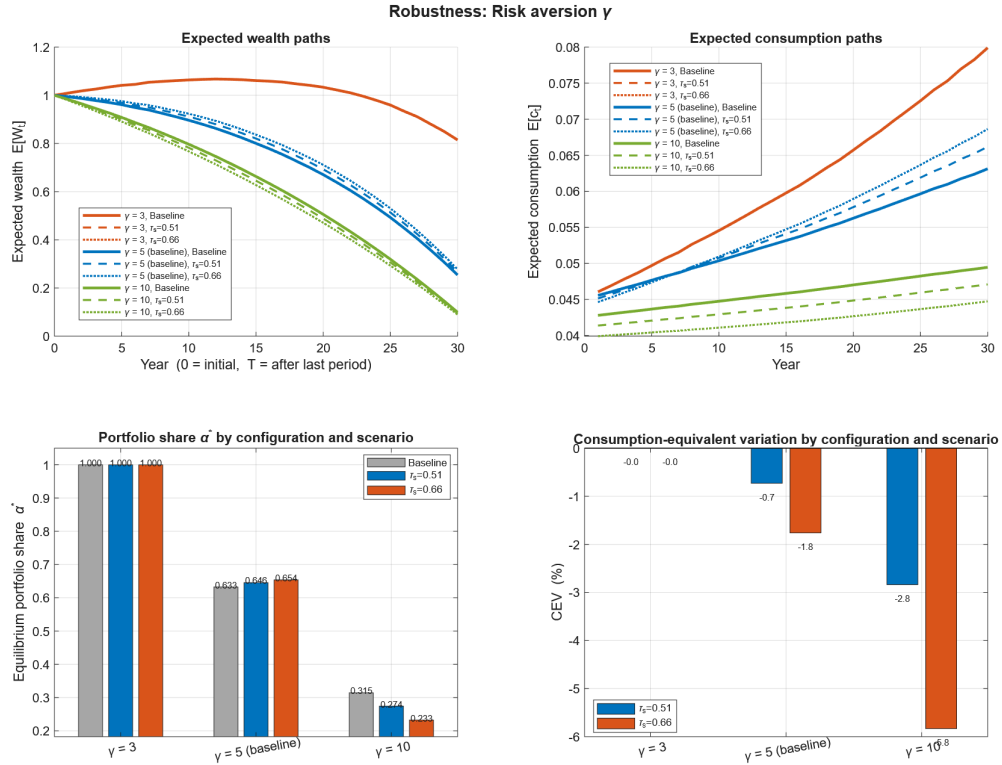


Figure 11: Robustness checks risk-aversion γ



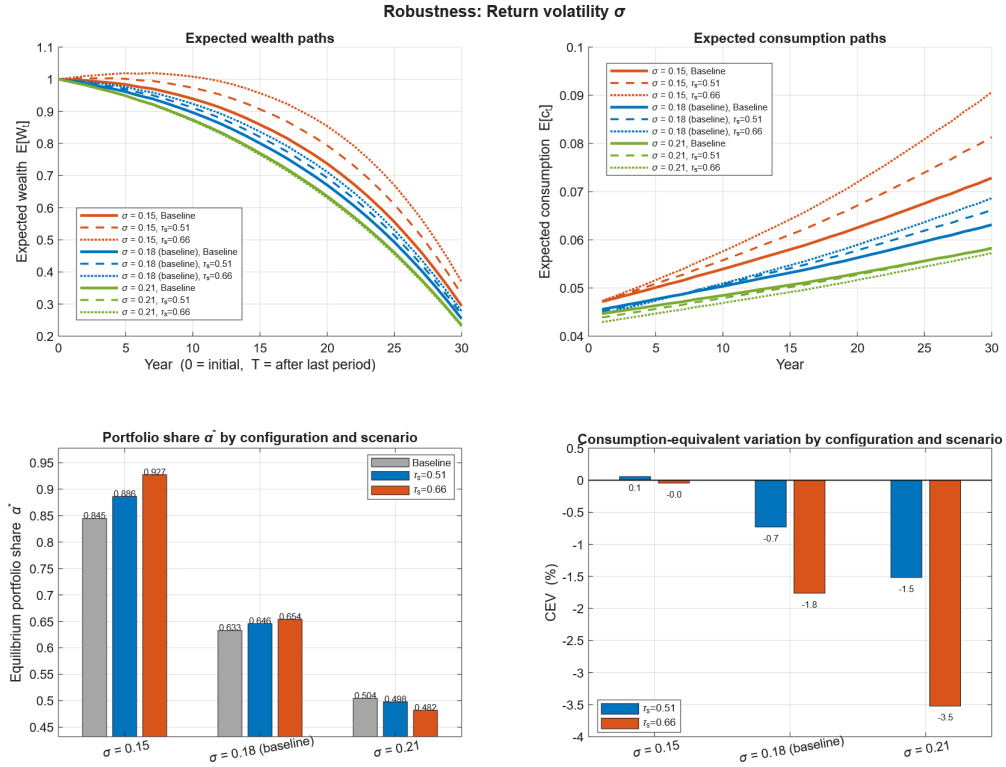
effects are negligible. This case thus very much resembles the case without any behavioural responses. See the discussion above.

Compared with the baseline, at a higher level of risk aversion ($\gamma = 10$) differential taxation of safe and risky assets now *reduces* wealth accumulation, *reduces* the optimal portfolio share, and increases welfare losses of differential taxation even further. The intuition for these seemingly paradoxical findings lies in the effect of risky taxes on the required risk-premium – see also the theoretical section above.

As discussed before, the substitution effect of lower taxes on risky assets and higher taxes on safe assets yields higher portfolio shares of risky assets. However, the impact of tax-risk on the risk premium reverses at higher levels of risk aversion, because the sign of $\text{cov}(u', \tau_r)$ flips from negative to positive. This means that the household's marginal utility is highest in states where the tax rate is lowest, because then the investment loss has the biggest impact on marginal utility. Therefore, critical states are not bad paths in their entirety, but specifically *bad periods within good paths*. On a good overall path, the tax rate on risky assets $\tau_r(\Theta)$ is low. Hence, loss-offsets are correspondingly low, so the household bears almost the entire loss in any period with a low return. At the same time, a high tax rate on safe assets on such paths reduces the buffer from safe capital income. As a result, tax rate uncertainty raises the risk premium, and it increases with γ . The household thus responds by optimally *reducing* the optimal portfolio share α^* . At high levels of γ , this effect can be so strong that it offsets the substitution effect of differential taxation on risk-taking. This is the reason that risk taking decreases in Figure 11. This also explains why wealth accumulation and consumption both go down relative to the baseline.

This case demonstrates that the effects of differential taxation on wealth accumulation are not

Figure 12: Robustness checks return volatility σ



robust with respect to risk aversion. With sufficiently large risk aversion, wealth accumulation and consumption can even fall under differential taxation. Still, the effects are quantitatively small. What is robust, however, are the welfare losses of differential taxes. With higher risk aversion, the welfare losses are even larger than in the baseline.

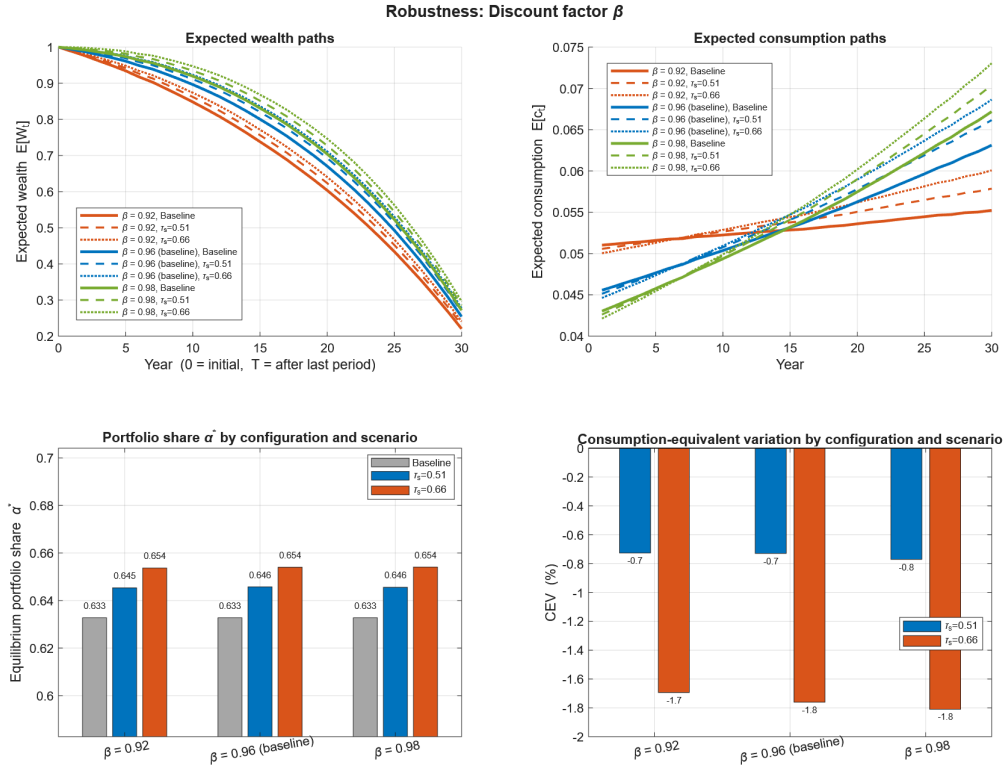
3.1.2 Volatility of investment returns σ

Figure 12 shows how robust the findings of the baseline are with respect to changing the volatility in investment returns σ . With lower volatility the optimal portfolio share goes up. In one case, with low return volatility ($\sigma = 0.15$), and very low taxes on risky assets, the household chooses a corner and sets the portfolio share in risky assets to 1. Wealth and consumption paths shift upwards as well if taxes on risky assets are reduced. Welfare losses of tax-rate differentiation on safe and risky assets decrease compared to the baseline. The reverse is true with higher volatility ($\sigma = 0.21$). All effects of tax-rate differentiation on portfolio choices, consumption and wealth paths, and welfare losses are now more pronounced than in the baseline.

3.1.3 Discount rate β and bequest preference η

Changes in the discount rate or bequest preference do not change any conclusion. See also Figures 13 and 14. A change in the discount rate or bequest preference has no effect on optimal portfolio choices. A larger (smaller) discount rate or bequest preference increases (decreases) wealth accumulation. A change in the discount rate tilts the consumption profile, while a change in the bequest preference only shifts the consumption profile. The welfare effects of differentiated

Figure 13: Robustness checks discount rate β



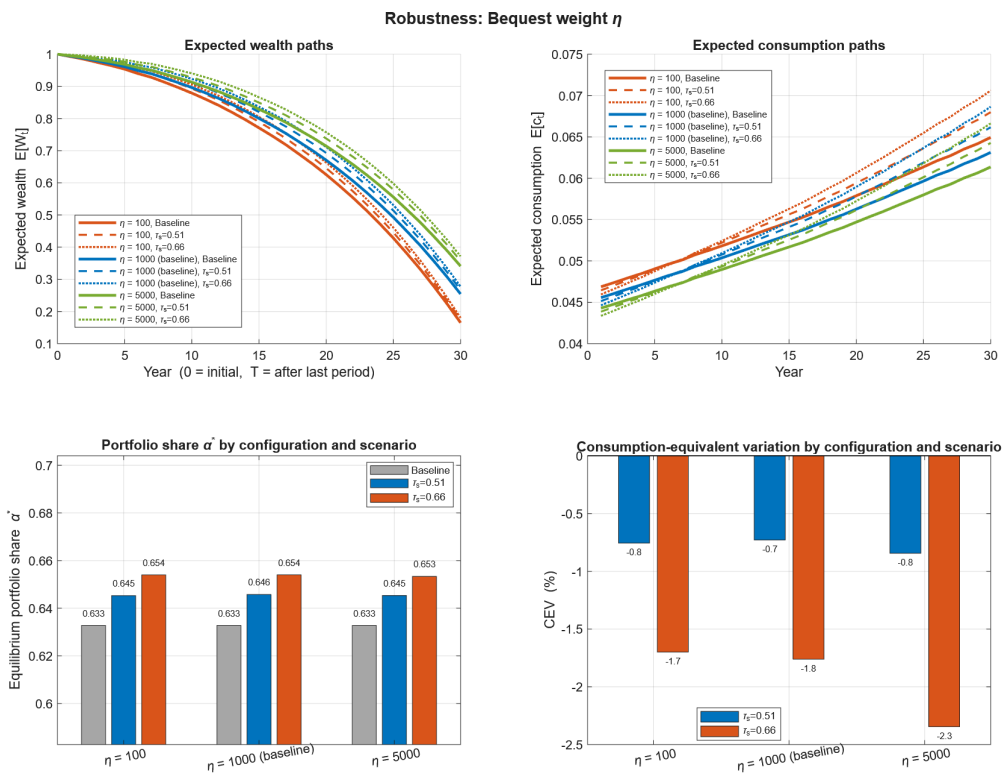
taxes are nearly identical to those of the baseline.

4 Conclusion

This paper asked the question: Does a realisation-based capital gains tax lead to more wealth accumulation than an accrual-based capital gains tax? The answer is negative, as wealth accumulation remains virtually unchanged. The reason is threefold. First, expected taxes remain the same for each revenue-neutral switch from taxes on risky to safe assets, and therefore wealth accumulation is approximately unaffected by variations in tax burdens – ceteris paribus behavioural effects on portfolio and consumption choices. Second, under realisation-based capital gains taxation investors will change their exposure to higher-yielding risky assets. This depends on the substitution effect as lower taxes on risky assets and higher taxes on safe assets raise portfolio shares of risky assets. However, taxes are also risky and they may interact with asset returns. Depending on the degree of risk-aversion, investors may increase portfolio shares of risky assets further (low risk aversion) or actually reduce portfolio shares of risky assets if risk-aversion is so high that it overturns the substitution effect. If portfolio shares increase (decrease), wealth accumulation rises (declines) – ceteris paribus. However, this behavioural response also implies that households consume more (less) on average – resulting in less (more) wealth accumulation over the life-cycle – ceteris paribus. Third, a move towards realisation-based capital gains taxes might tilt the consumption profile a bit more (less) towards the future. The net effect of all these effects on wealth accumulation is found to be quantitatively small.

The welfare effects, however, are unambiguous. The move towards a realisation-based capital

Figure 14: Robustness checks bequest preference η



gains tax always lowers social welfare because of larger portfolio distortions. The quantitative evidence presented in this paper demonstrated that portfolio distortions are substantial and grow to multiple percentage points of lifetime consumption with larger rate differentiation on safe and risky assets. Hence, the move towards an ACGT would be welfare-superior compared to an RCGT.

References

- Aart Gerritsen. Commentaar op LinkedIn. <https://www.linkedin.com/feed/update/urn:li:activity:7419743363832393728/>, 2026.
- Roger H. Gordon. Taxation of corporate capital income: Tax revenues versus tax distortions. *Quarterly Journal of Economics*, 100(1):1–27, 1985.
- Bas Jacobs. The tax benefit of deferred realisation under a capital gains tax and the budgetary effects of accrual-based and realisation-based taxes on capital gains. mimeo, Vrije Universiteit Amsterdam, 2026a.
- Bas Jacobs. Brengt een vermogenswinstbelasting meer opbrengsten op dan een vermogensaanwasbelasting? Nee. Memo, Vrije Universiteit Amsterdam, 2026b.
- Louis Kaplow. Taxation and risk taking: A general equilibrium perspective. *National Tax Journal*, 47(4):789–798, 1994.
- Robert C. Merton. Lifetime portfolio selection under uncertainty: The continuous-time case. *Review of Economics and Statistics*, 51(3):247–257, 1969.
- Paul A. Samuelson. Lifetime portfolio selection by dynamic stochastic programming. *Review of Economics and Statistics*, 51(3):239–246, 1969.
- Dirk Schindler. Taxing risky capital income—a commodity taxation approach. *FinanzArchiv: Public Finance Analysis*, 64(3):311–333, 2008.
- Tweede Kamer. Wijziging van de wet inkomstenbelasting 2001 om werkelijke inkomsten uit bezittingen en schulden in box 3 te belasten (wet werkelijkrendement box 3). Kamerstuk vergaderjaar 2025–2026, 36748, nr. 45, Den Haag: Tweede Kamer der Staten Generaal, 2025.
- Ruud van den Dool, Aart Gerritsen, and Bas Jacobs. De vermogensaanwasbelasting krijgt veel kritiek, maar is beste keuze voor box 3. *Het Financieele Dagblad*, februari 26 2026.
- VNO-NCW. Notitie over diverse aspecten van een vermogenswinst- en een vermogensaanwasbelasting. Niet gepubliceerd, Den Haag: VNO-NCW, 2026.