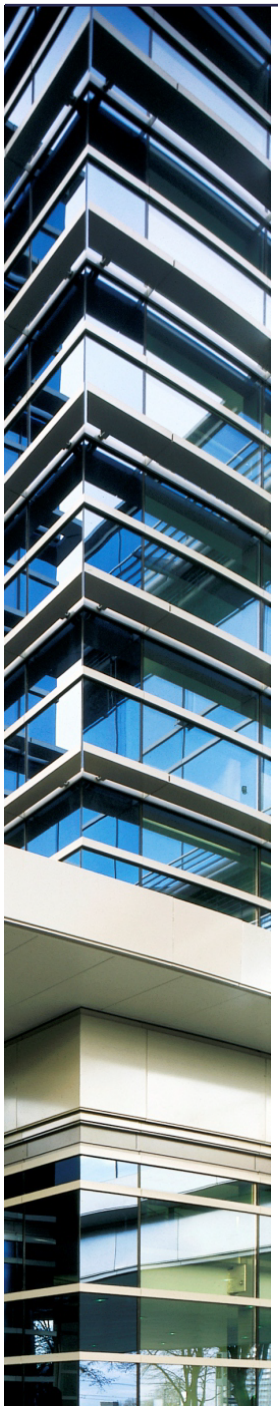
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How Tax Incentives Shape Participation and Contributions in Tax-Favoured Saving Schemes: Evidence from Latvia's 2017–2018 Reforms

Ludmila Fadejeva[*], Oļegs Tkačevs[†]

November 9, 2026

Abstract

This paper analyses the impact of the 2017–2018 personal income tax reforms in Latvia on long-term voluntary saving behaviour in tax-favoured instruments, namely the third pension pillar and life insurance policies with a savings component. Using rich administrative microdata from personal income tax declarations covering the period 2010–2023, we study behavioural responses along both the extensive margin (entry and exit) and the intensive margin (contribution levels and income elasticity). We find that the 2017 reform substantially reduced short-term tax optimisation among older individuals, while the 2018 reform primarily affected those who had previously made extensive use of the available tax advantages, particularly high-income individuals and contributors close to the tax-deductible limits. Entry responses were considerably stronger than exit responses, highlighting pronounced behavioural inertia. We also find that contributions increase with income and participation duration, while income elasticity declined following the 2018 reform. The findings highlight the importance of designing tax incentives that balance fiscal costs with the objective of encouraging broad and sustained participation in voluntary retirement saving schemes.

Keywords: tax incentives, retirement savings, behavioural responses, administrative data

JEL Codes: D14, H24, H31, J26

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1 Introduction

Tax incentives are a widely used policy instrument to encourage voluntary long-term saving for retirement, particularly in countries where public pension systems provide only partial income replacement. However, the effectiveness of such incentives depends on how individuals respond to them. Responses may occur through increased participation, higher contribution levels, or substitution across saving vehicles. Moreover, behavioural frictions such as inertia and limited attention may substantially shape the outcomes observed.

This paper studies the case of Latvia, where 2017-2018 personal income tax reforms tightened eligibility conditions for tax refunds. These reforms were motivated by concerns that parts of the system were being used primarily for short-term tax optimization rather than genuine retirement saving.

Latvia offers a particularly suitable institutional setting. Following a transition from a pay-as-you-go pension system to a three-pillar model, voluntary private savings have become increasingly important for ensuring adequate income in old age. At the same time, participation in voluntary schemes has historically been uneven across income and age groups. Against this background, the reforms provide a setting to assess how individuals adjust their saving behaviour when tax incentives are restricted.

Using administrative income declaration data covering more than a decade, the paper addresses three main research questions. First, how did the reforms affect participation in tax-favoured saving schemes, including entry and exit dynamics? Second, how did contribution levels and opportunity-seeking behaviour respond? Third, has the income elasticity of contributions changed following the reforms? By answering these questions, the paper contributes to both the academic literature and ongoing policy debates on the optimal design of retirement saving incentives.

We find that changes in tax incentives primarily affect long-term tax-favoured saving behaviour through participation decisions, especially entry, rather than through widespread exits or the immediate adjustment of contributions. The 2017 reform, which eliminated short-term withdrawal opportunities for individuals aged 55 and over, was associated with a sharp decline in entry and high-intensity contribution behaviour among older individuals, while exit responses were comparatively modest. This is consistent with strong behavioural inertia and with responses concentrated on the margins requiring active decision-making. The 2018 reform, which tightened incentives

economy-wide through a joint contribution cap and longer minimum holding periods, coincided with a persistent reduction in entry into tax-favoured saving schemes, with particularly strong responses among high-income individuals and those in early-to-mid working careers, while exit behaviour remained largely unchanged. Finally, contribution behaviour among participants exhibits gradual adjustment and substantial heterogeneity: contributions rise less than proportionally with income, income elasticity is higher among contributors close to the tax-deductible contribution limit and declines with age. New entrants initially contribute less and converge only slowly over time. Following 2018, income responsiveness declined and behavioural differences across contributor types narrowed, particularly at the upper end of the income distribution.

These findings contribute to the literature in several ways. First, they reinforce evidence from other European countries that tax-favoured saving schemes are particularly prone to opportunity-seeking behaviour among high-income and financially sophisticated individuals, and that such behaviour can be curtailed through targeted changes in the legislation. Second, they underscore the central role of behavioural frictions: participation decisions, especially entry, are far more responsive to policy changes than exit or immediate contribution adjustments. Third, by combining participation analysis with evidence on income elasticity and contribution dynamics, the paper highlights the importance of entry. It has potentially long-lasting effects on aggregate saving, because contribution intensity among new participants increases gradually over time.

From a policy perspective, the results suggest that the tightening of tax incentives primarily affected individuals who previously benefited most from the tax incentives. The 2018 reform was associated with a pronounced reduction in entry and contribution amounts among high-income individuals and those previously contributing close to the tax-deductible limits. However, due to a pronounced decline in participation, these findings should not necessarily be interpreted as evidence of an improvement in the overall effectiveness of the retirement saving policy. The gradual increase in contributions with participation duration highlights the importance of encouraging initial participation for the long-term development of voluntary retirement saving. These findings suggest that the design of tax incentives should consider their fiscal cost, susceptibility to tax optimisation, as well as their effectiveness in promoting broad and sustained participation.

An important limitation of this study concerns the scope of the outcomes examined. The analysis focuses on participation in and contributions to tax-favoured long-term saving instruments, rather than on total household saving. Individuals discouraged from participating in these schemes may

redirect funds towards other assets, including deposits, stocks, bonds, or exchange-traded funds. Consequently, a decline in participation or contributions need not imply a corresponding reduction in total saving. Assessing such substitution is beyond the scope of this study, as the administrative data do not provide information on individuals' broader asset holdings or saving flows outside the tax-favoured instruments. Although the Household Finance and Consumption Survey (HFCS) provides information on household wealth, the Latvian households surveyed in 2017 and 2020 differ, preventing us from tracking changes in the portfolios of the same households around the reforms. Moreover, only a very small share of individuals in Latvia actively invest in financial assets other than bank deposits outside these tax-favoured schemes.

The remainder of the paper is structured as follows. Section 2 reviews the related literature. Section 3 provides the institutional background, describes the dataset, and presents summary statistics. Section 4 outlines the econometric methodology and presents the results for each component of the reform package, examining the effects of tax legislation changes on entry, exit, and contribution amounts among continuing participants. Section 5 focuses on the intensive margin and analyses the income elasticity of contributions, with particular attention to differences before and after the reform. Finally, Section 6 concludes.

2 Related Literature

This paper relates to research on how tax incentives shape participation in and contributions to tax-favoured saving schemes. Three closely related issues are particularly relevant: (i) adjustment along the extensive (participation/entry) and intensive (contribution levels) margins, (ii) heterogeneity in responses across individuals, and (iii) the role of incentive design, including contribution limits and eligibility conditions. Additionally, the literature on whether tax-favoured saving vehicles generate new private saving or merely reallocate portfolios provides an important qualification for interpreting our findings: changes in contributions to tax-favoured instruments need not translate into corresponding changes in total household saving.

A central strand of the literature examines savings responses to tax incentives, particularly the distinction between participation decisions (extensive margin) and contribution levels (intensive margin). Using Danish administrative data and exploiting a reform that reduced subsidies for high-income individuals, Chetty et al. (2014) show that contributions to subsidised pension accounts

fall sharply. However, the underlying behavioural pattern is crucial: the effect is stronger on the probability of contributions by new contributors rather than on the contribution amounts made by the existing participants. Chetty et al. (2014) also highlight that individuals who are wealthier, older and those who actively changed their pension contributions in previous years are more responsive to changes in tax incentives. Evidence from Spain, provided by Ayuso et al. (2019), similarly stresses heterogeneity by age and proximity to retirement. They find that responses to the introduction of tax incentives differ substantially across age groups and are particularly strong among individuals closer to retirement age. These considerations are relevant for Latvia, where access to third pillar pension savings is age-dependent and the 2017 reform restricted opportunities for short-term tax optimisation among older individuals.

Another closely related strand examines contribution limits and their implications for saving behaviour. Christensen and Ellegaard (2023) examine a Danish reform that reduced contribution limits and document declines in contributions among affected middle-income workers. Their findings indicate that responses to tighter limits are not confined to the highest-income contributors. Chan et al. (2022) show that higher contribution caps can substantially increase retirement contributions, with part of the response financed through higher earnings associated with labour supply adjustments. Their findings suggest that changes in contribution limits can affect both saving behaviour and taxable income. This suggests that reforms changing caps can affect both savings behaviour and, indirectly, taxable income. The contribution-limit literature is directly relevant to Latvia's 2018 reform, which replaced separate limits for pension and life insurance contributions with a joint cap and introduced an absolute annual ceiling.

Research on life insurance provides a complementary perspective on responses to tax incentives. Sauter et al. (2015) document an increase in life insurance ownership in Germany following more favourable tax treatment. In contrast, Jappelli and Pistaferri (2003) find no evidence that reduced tax incentives affected life insurance demand in Italy. Hecht and Hanewald (2012) emphasise heterogeneity in responses to life insurance tax reforms, including differences associated with education and income. They show stronger reactions among better-educated and higher-income households. Together, these studies suggest that institutional arrangements, product characteristics, and individual circumstances can shape adjustment to tax changes. This literature is relevant to our setting because the 2018 reform increased the minimum duration of new life insurance contracts eligible for tax relief. However, our administrative data combine pension and life insurance contributions,

preventing us from identifying responses separately for the two products or isolating the effects of individual components of the reform.

A related but distinct literature asks whether tax-favoured saving generates additional household saving or induces substitution across assets. Studies including Venti and Wise (1986), Venti and Wise (1990), Poterba et al. (1995), Poterba et al. (1996), and Gelber (2011) provide evidence in favour of additional saving, whereas Engen et al. (1994), Gale and Scholz (1994), and Attanasio and DeLeire (1994) report virtually no effect on total savings. For Latvia, Fadejeva and Tkacevs (2022) provide evidence consistent with substantial substitution between tax-favoured saving and other assets. This distinction matters for interpreting our results: reductions in participation or contributions within subsidised schemes need not imply equivalent reductions in total saving. The present paper does not estimate such substitution and therefore does not establish the effects of the reforms on total household saving.

Overall, the literature provides several insights relevant to our study. First, behavioural frictions can generate different responses across entry, exit, and contribution decisions, motivating a separate analysis of these margins. Second, responsiveness to tax incentives varies across age and income groups. Third, product-specific features, including contribution caps, minimum contract durations, and withdrawal conditions, shape the incentives faced by different contributors. Finally, potential substitution across assets means that changes in contributions to tax-favoured schemes cannot, on their own, establish changes in total household saving.

This paper contributes to the literature by examining participation and contribution responses to two successive reforms in Latvia that altered different dimensions of tax incentives: opportunities for short-term tax optimisation in 2017 and the generosity and flexibility of incentives in 2018. Using administrative tax declaration data, we examine entry, exit, and contribution amounts, with particular attention to heterogeneity across age, income, and contribution patterns. We complement this analysis with evidence on the income elasticity of contributions and their evolution with participation duration. Whereas Fadejeva and Tkacevs (2022) examine substitution between tax-favoured saving and other assets in Latvia, our focus is on adjustment within the tax-favoured schemes.

3 Data and Institutional background

3.1 Long-term saving instruments and the 2017–2018 reform

Latvia provides tax incentives for voluntary contributions to two long-term saving instruments: the third pension pillar (P3) and investment-linked life insurance policies with a savings component. Contributions to these instruments are deductible from taxable income, subject to statutory limits. Access to accumulated funds is restricted until a person reaches the age of 55 for the pension pillar or until contract maturity for the life insurance, while also meeting minimum duration requirements.

Prior to 2017, the tax framework allowed individuals aged 55 and over to contribute to these schemes late in the calendar year and withdraw funds shortly thereafter, effectively using the instruments as short-term tax shelters. The 2017 reform eliminated this possibility by tightening withdrawal conditions for older individuals. Under the new rules, contributions cannot be withdrawn for at least two tax years to retain eligibility for the personal income tax refund. This change was explicitly aimed at curbing opportunity-seeking behaviour.

In 2018, a broader reform was implemented. The previously separate contribution limits of 10% of annual gross income for pension and life insurance products were replaced by a single joint cap of 10% of gross income, subject to an overall annual ceiling of EUR 4,000. In addition, the minimum duration of new life insurance contracts eligible for tax refunds was increased from five to ten years. The government also introduced a progressive personal income tax schedule, replacing the flat rate of 23% applicable in 2017 with three rates: 20%, 23%, and 31.4%. However, the tax refund rate for eligible contributions to both saving instruments was reduced from 23% to a uniform 20%, irrespective of the contributor's income bracket and conditional on sufficient personal income tax having been paid. Together, these changes reduced the generosity and flexibility of tax incentives. While the reduction in the refund rate applied across income groups, the tighter contribution limits were expected to strongly affect high-income individuals and those contributing close to the deductible ceiling.

3.2 Data sets

The analysis uses annual administrative records from personal income tax declarations submitted in Latvia between 2010 and 2023. The submission of declarations is voluntary, implying that the data cover individuals who actively engage with the tax system and claim deductions. This feature

is relevant for studying decisions to join voluntary saving schemes and contribution amounts.

The dataset includes information on declared contributions to tax-favoured saving instruments, taxable income, age, gender. Contributions made by employers are excluded, as they are subject to a different tax regime and are not observed in the income declarations. A limitation of the data is that contributions to pension funds and life-insurance cannot be distinguished, as these are recorded as a single item in declarations. However, the reforms affected both instruments simultaneously, making the combined analysis appropriate.

The reasons for submitting personal income declarations are not limited to claiming deductions from personal income tax. Individuals can claim tax relief for medical and education expenses, as well as, a tax refund for higher income tax paid due to the progressive non-taxable minimum (from 2016 to 2024). This ensures that the sample of people who submit declarations is broadly similar to the overall income-earning population.

For analysis purposes, we aggregate the age variable into age groups: 18-24, 25-34, 35-44, 45-54, 55-64, 65+ and taxable income into ten income groups (deciles).[1] We define *participation* as having a positive declared contribution to private pension or life-insurance in a given year. *New entrants* are individuals who contribute for the first time, while *exiters* are those who stop contributing for at least two consecutive years (e.g., no contribution in the current year and the following year). We define *maximizers* as individuals contributing at least 9% of taxable income or at least EUR 3,500 in a given year (i.e. close but not necessarily precisely at the tax-deductible threshold). The data used to estimate the probability of entry in a corresponding year is restricted to individuals who have not yet contributed to a private pension scheme or an investment-linked life insurance instrument (since 2010 up to a defined year) as well as to the new entrants. To estimate the probability of exit in a corresponding year, the dataset is restricted to those who contributed in the previous year.

3.3 Descriptive Evidence

This section provides descriptive evidence on participation, entry and exit dynamics, and contribution amounts in tax-favoured long-term saving schemes. Figure 1 plots the absolute number of personal income tax declarations reporting positive contributions to both schemes over the period 2010–2023, disaggregated by income decile (left panel) and age group (right panel).

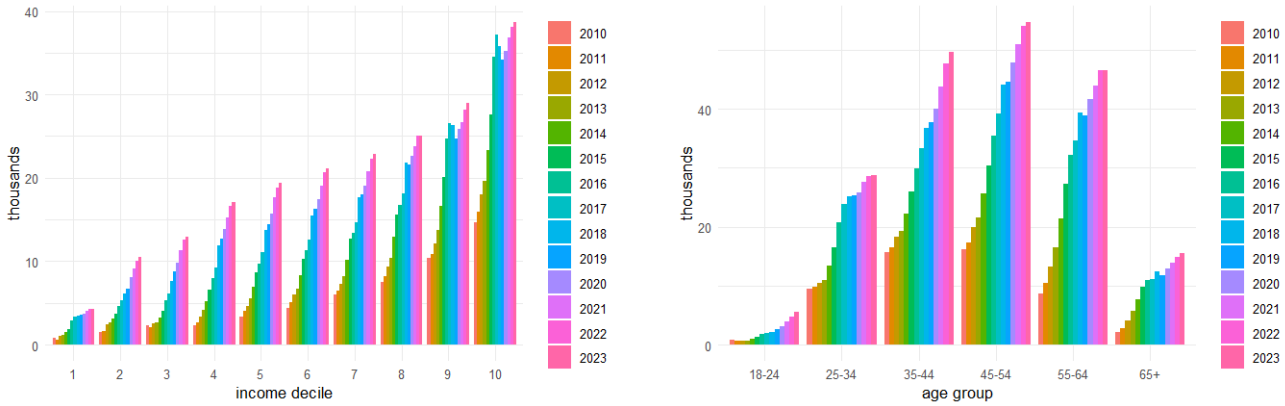
Participation in private pension plans and life-insurance schemes increased steadily over time,

[1] Income and age groups are year-specific, allowing the same individual to belong to different categories over time.

Figure 1: Number of income tax declarations with non-zero contributions to tax-favoured saving schemes

(a) by income deciles

(b) by age groups



Source: Authors' estimations based on individual personal income tax declarations

reflecting rising awareness of tax-favoured saving instruments. Growth is visible across the entire income distribution and across most age groups. Regarding income distribution, lower and middle income deciles exhibit sustained increases throughout the sample period, whereas participation among top-income individuals begins to plateau toward the end of the sample. This flattening suggests that participation among high earners reaches saturation earlier, that is individuals with higher income and greater financial sophistication tend to enter tax-favoured schemes sooner and exhaust the pool of potential new participants more quickly. A similar pattern emerges across age groups. Participation rises strongly among individuals aged 35-54, who represent the core group engaging with long-term saving instruments. In contrast, participation among older cohorts grows more slowly and stabilises earlier, consistent with shorter remaining saving horizons and the tightening of tax incentives implemented in 2017.

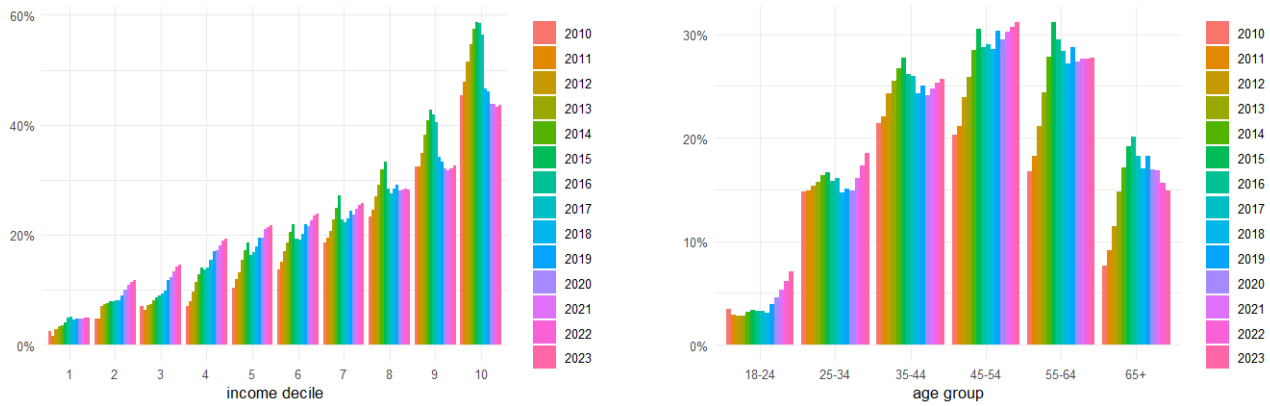
Figure 2 depicts the proportion of personal income tax declarations reporting positive contributions to tax-favoured schemes, again disaggregated by income decile (left panel) and age group (right panel). In line with the pattern already observed in Figure 1, participation among lower-income deciles and among people aged 45 to 54 years increased throughout the period, despite the tightening of tax incentives in 2017–2018. By contrast, participation among young individuals in their 20s and early 30s remains low, likely reflecting the long minimum holding periods associated with these saving instruments.

Looking at the evolution of the absolute number of newcomers and exiters in tax-favoured

Figure 2: Proportion of income tax declarations with non-zero contributions to tax-favoured saving schemes from all declarations

(a) by income deciles

(b) by age groups



Source: Authors' estimations based on individual personal income tax declarations

long-term saving schemes over time (Figure 3), two developments stand out. First, the number of newcomers declines sharply after 2018. Prior to the reform, entry into tax-favoured saving schemes was substantial and increasing, reflecting continued expansion of participation. From 2018 onwards, however, the number of newcomers declines markedly and remains persistently lower in the subsequent years, stabilizing at around 2,000 new participants per year across most income deciles. The only exception is the lowest income decile, where the number of new entrants is approximately 1,000 per year. Second, the number of exiters increases after 2018, but the magnitude and persistence of this response differ from the entry margin. While exits rise in the immediate post-reform period, the increase (in thousands of people) is considerably smaller than the contemporaneous decline in entry. As a result, changes in participation dynamics after 2018 are driven primarily by reduced inflows rather than by large or persistent outflows.

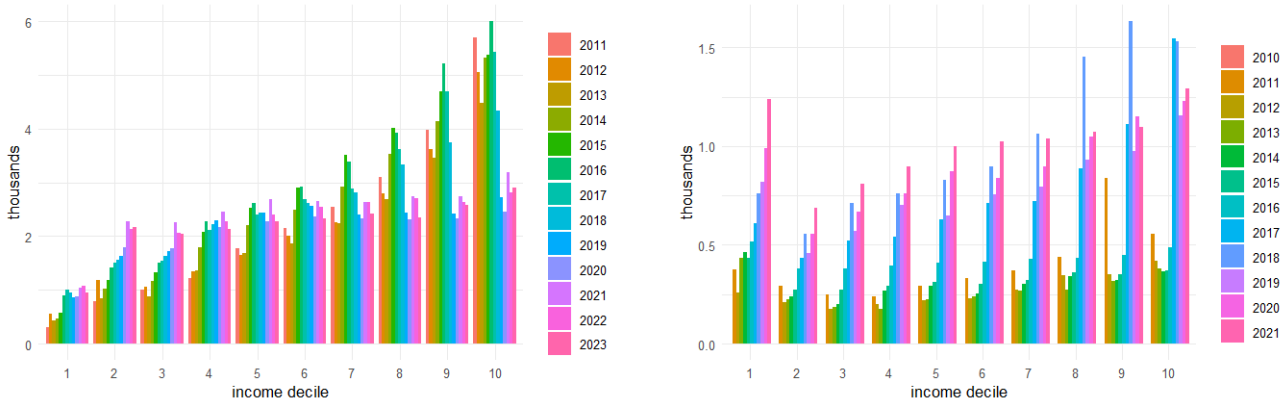
Disaggregation by income decile indicates that, before the reform, entry was more concentrated among higher-income individuals, whereas after 2018 the remaining entrants are more evenly distributed across the income distribution. Exit patterns, by contrast, show less pronounced income heterogeneity, suggesting that income plays a smaller role in the decision to stop contributing than in the decision to enter.

Turning to the evolution of contribution amounts, Figure 4 illustrates that average contributions to tax-favoured saving schemes increased steadily over time, reflecting both rising incomes and the gradual deepening of engagement among existing participants. While most contributors make

Figure 3: Number of new entrants and exiters in tax-favoured saving schemes

(a) new entrants

(b) exiters



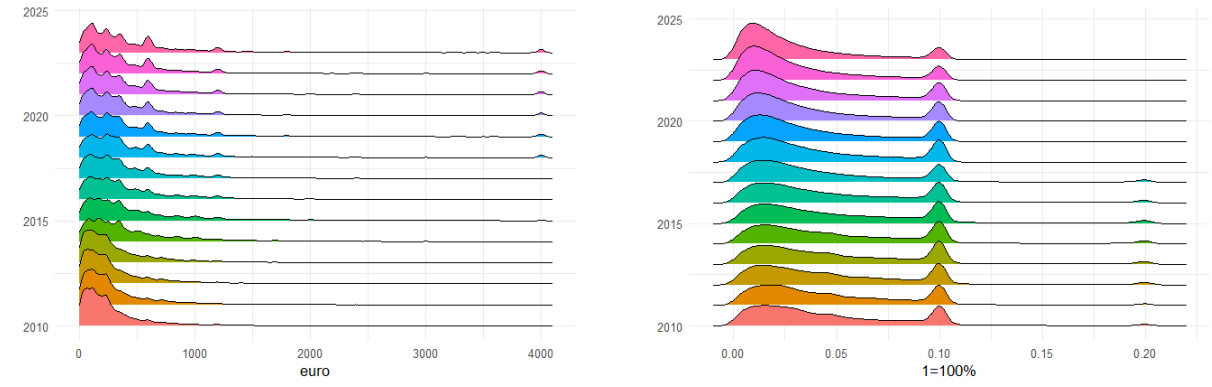
Source: Authors' estimations based on individual personal income tax declarations

relatively modest payments, a non-negligible share of individuals consistently contributes amounts close to the maximum eligible for tax refunds (2.5% of contributors in 2023). The concentration of contributions at or near the statutory tax-deductible threshold is particularly pronounced prior to the 2017 and 2018 reforms. During this period, some individuals contributed up to 10% of taxable income to *each* long-term saving instrument, an option that was eliminated with the introduction of the joint contribution cap in 2018.

Figure 4: Distribution of annual contribution amounts to tax-favoured saving schemes

(a) euro

(b) share of taxable income



Source: authors' estimations

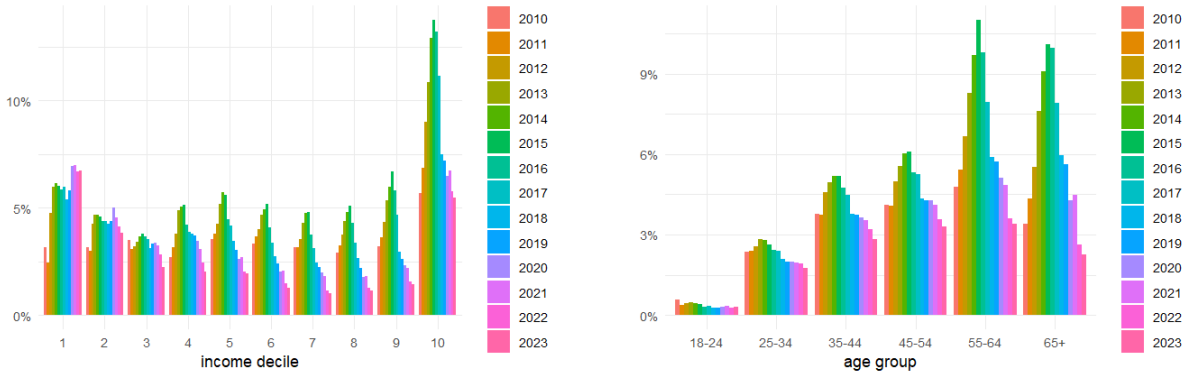
Maximizer behaviour is strongly related to income (Figure 5). The share of contributors contributing at the tax-deductible threshold is highest among individuals in the top income decile (5% of contributors in 2023). Interestingly, the share of maximizers also increases at the very bottom of the income distribution. This pattern may indicate that some individuals in the lowest income

group are able and willing to finance relatively high contributions (as a percentage of taxable income) despite low declared income, potentially reflecting income underreporting or participation in the shadow economy. In 2023, the share of maximizers in the bottom income group exceeds the one observed in the top decile.

Figure 5: Share of maximizers contributing at the tax-deductible threshold by income decile and age group

(a) income decile

(b) age group



Source: Authors' estimations based on individual personal income tax declarations
Note: maximizers are people who contribute at least 9% or 3500 euro (or more) of taxable income to tax-favoured saving schemes.

Maximizer behaviour also varies systematically across age groups and over time. Prior to the 2017–2018 reforms, older individuals, particularly those aged 55 and over, were substantially more likely to contribute at the tax-deductible threshold than younger contributors (Figure 5). This age effect largely disappears after the reform, and in the post-reform period differences in the share of maximizers across age groups become considerably smaller.

Focusing on the distribution of contributors by income decile in 2023 (Figure 6), the statutory cap of EUR 4,000 introduced in 2018 appears to be binding for individuals in the top income decile. As a result, maximizers in this group contribute less than 10% of their gross income, despite having contributed at higher relative rates prior to the reform.

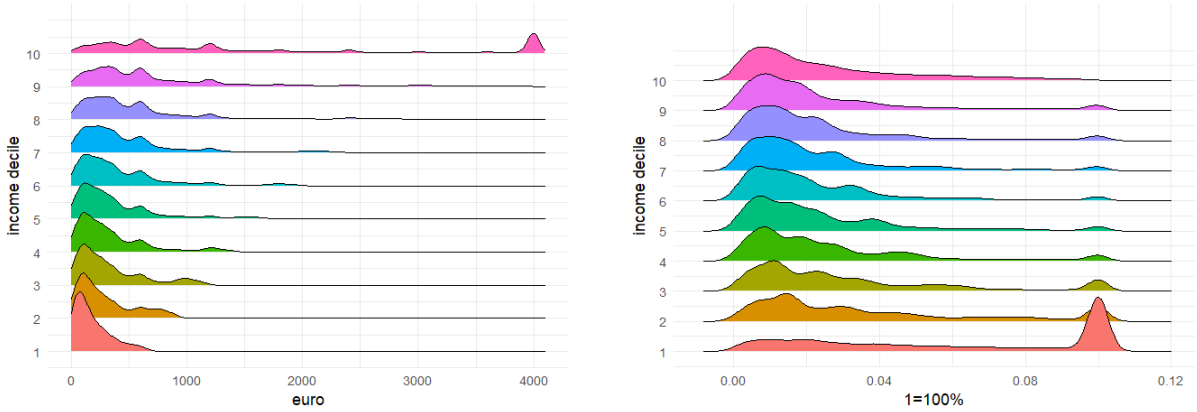
4 Behavioural Responses to the 2017–2018 Tax Reforms

4.1 The 2017 Reform and Opportunity-Seeking Behaviour among Older Individuals

Empirical strategy

Figure 6: Distribution of contributions to tax-favoured saving schemes in 2023 by income decile

(a) euro (b) 1=100%



Source: Authors' estimations based on individual personal income tax declarations

To evaluate the impact of the 2017 reform, which curtailed short-term tax optimization opportunities for individuals aged 55 and over, we employ a difference-in-differences (DiD) framework:

$$P_{i,t} = \beta_0 + \beta_1 \cdot post_t + \beta_2 \cdot treat_i + \beta_3 \cdot post_t \cdot treat_i + \beta_X \cdot X_{i,t} + \varepsilon_{i,t}, \tag{1}$$

where $P_{i,t}$ represents an individual-level outcome capturing saving behaviour. Specifically, it alternately measures (i) the probability of entry into tax-favoured saving schemes, (ii) the probability of exit, (iii) the logarithm of contribution amounts, or (iv) the probability of being a maximizer. $post_t$ denotes an indicator for the year 2017, $treat_i$ is an indicator for individuals aged 54 and over, who were directly affected by the reform.[2] Following the reform, this possibility was eliminated. As a result, individuals aged 54 at the time of contribution were also affected by the policy change, which justifies including them in the treated group. $X_{i,t}$ includes controls for gender, income decile, and age group. The coefficient of interest, β_3 ($post \cdot treat$), uncovers the local average treatment effect. It captures the causal effect of the reform under the assumption of parallel pre-reform trends. We restrict the sample to the two years before and one after the reform (2015–2017). Entry and exit probabilities are estimated using pooled OLS, while contribution amounts and maximizer status are estimated using panel regression with individual fixed-effects.

[2]Age 54 is chosen as the cut-off because, prior to the 2017 reform, individuals aged 54 in a given tax year could still make contributions and withdraw the accumulated funds shortly after reaching age 55, thereby benefiting from short-term tax optimisation. However, we also assess robustness to an alternative definition of the treatment group, restricting it to individuals aged 55 and over. The estimated effects of the 2017 reform are slightly smaller, but qualitatively our conclusions remain unchanged.

Results

Figure 7 reports the estimates of the local average treatment effect of the 2017 reform on saving behaviour, comparing individuals aged 54 and over with younger cohorts. Several clear patterns emerge. First, the reform led to a statistically significant decline in entry into tax-favoured saving schemes among older individuals. While entry probabilities fell for all age groups in 2017, the reduction was substantially larger for the treated group, indicating that the reform disproportionately discouraged new participation among those previously able to exploit short-term tax optimisation opportunities. Before the reform, individuals aged 54 and over had a 6% probability of entering the saving scheme. Following the reform, this probability declined by 1.1 percentage points, equivalent to a relative reduction of 18.3%.

Second, exit behaviour displays the opposite pattern. The probability of exit increased following the reform, with a positive and statistically significant treatment effect for individuals aged 54 and over. Although the magnitude of the exit response is smaller than the decline in entry for individuals aged 54 and over (a 0.4 percentage point increase relative to a baseline exit level of 7.4% results in, on average, a 5.71% stronger exit), the direction of the effect is consistent with the reform reducing the attractiveness of remaining in the scheme for those close to retirement who had previously used these instruments opportunistically.

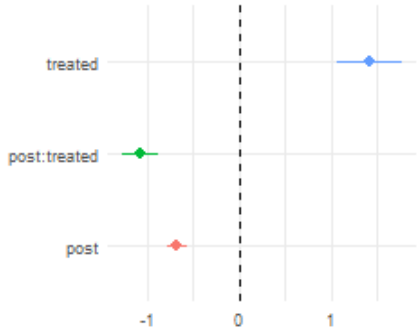
Third, contribution behaviour adjusted sharply along the intensive margin. Conditional on participation, contribution amounts declined for individuals aged 54 and over relative to younger individuals, with an estimated reduction of approximately 12%. This suggests that the reform affected both participation decisions and the amounts contributed by participants. This finding is consistent with the elimination of incentives to make large end-of-year contributions purely to maximise tax refunds.

Finally, the reform also affected maximizer behaviour. The probability of contributing at or near the tax-deductible threshold fell markedly among individuals aged 54 and over, with an estimated effect that is both economically large and statistically significant. The estimated decline in the share of maximizers is 4 percentage points, equivalent to a relative reduction of 36%. This finding confirms that the 2017 reform succeeded in curbing short-term tax arbitrage, which had been particularly prevalent in this age group prior to the policy change.

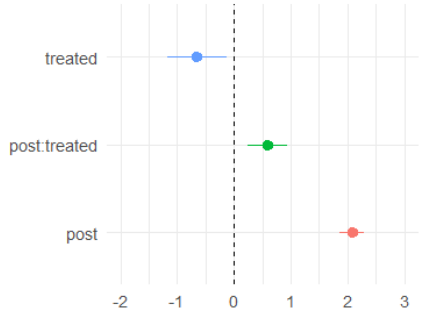
Taken together, the estimates in Figure 7 suggest that the 2017 reform primarily operated by discouraging entry and reducing large contributions among older individuals, while inducing only

Figure 7: Effect of the 2017 reform on entry, exit, contribution intensity, and maximizer behaviour among older individuals

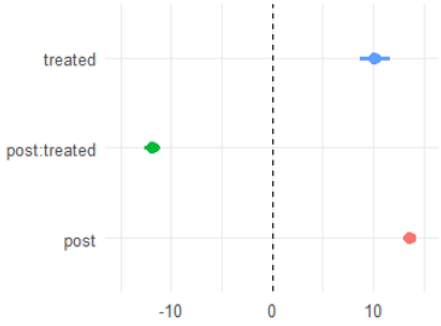
(a) probability of entry, pp.



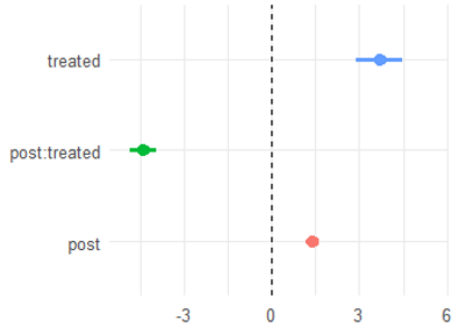
(b) probability of exit, pp.



(c) change in payment, %



(d) change in share of maximizers, pp.



Notes: Estimates of the local average treatment effect comparing individuals aged 55 and over (treated) to younger cohorts before and after the 2017 reform. Outcomes include the probability of entry, probability of exit, log contributions, and the probability of contributing at the tax-deductible threshold (maximizers). Point estimates and 95% confidence intervals are shown.

a modest increase in exits.[3] The stronger responses in entry and maximizer behaviour, compared with exit behaviour, are consistent with the behavioural inertia documented in the literature and suggest that policy changes mainly affect margins requiring active decision-making.

The effects documented in Figure 7 align closely with the behavioural public finance literature emphasising that responses to pension tax incentives are concentrated on margins requiring active decision-making. In particular, the pronounced decline in entry and contribution amounts, combined with an increase in exits, mirrors the active vs. passive mechanism highlighted by Chetty et al.

[3]The reform is estimated to have reduced the total number of participants by approximately 3,300, equivalent to 1.7% of the total participant population.

(2014). When subsidies or eligibility rules change, individuals who must make an active choice (e.g., starting to contribute or adjusting contributions) respond strongly, while many existing participants exhibit inertia and do not immediately unwind prior choices. In our setting, the reform directly reduced the payoff to short-horizon tax planning, so the strongest behavioural response appears where optimisation had been most attractive, initiation and high-intensity contributions, rather than through a mass withdrawal of existing participants. The findings are also consistent with evidence that older individuals respond more to fiscal incentives embedded in retirement saving products. Empirical work for Spain (Ayuso et al., 2019) finds that responsiveness differs strongly across age groups and is often most pronounced among cohorts approaching retirement.

4.2 Participation Responses to the 2018 Reform

Empirical strategy

The 2018 reform introduced a joint contribution cap across saving instruments and extended the minimum duration requirement for life insurance contracts. Unlike the 2017 reform, which applied to a clearly defined age group, the 2018 reform affected all contributors simultaneously. Identification therefore relies on differential exposure to the reform rather than on a sharp comparison of treated and control groups. To capture these heterogeneous participation responses, we estimate the following specification:

$$\begin{aligned} P_{i,t} = \beta_0 + \sum \beta_1 \cdot year_t + \sum \beta_2 \cdot age_group_{i,t} + \sum \beta_3 \cdot gender_i + \\ + \sum \beta_4 \cdot income_decile_{i,t} + \sum \beta_5 \cdot year_t \cdot income_decile_{i,t} + \\ + \sum \beta_6 \cdot year_t \cdot age_group_{i,t} + \varepsilon_{i,t}, \end{aligned} \tag{2}$$

where $P_{i,t}$ denotes the change in participation status (exit, entry), $year_t$ represents the year (2017 serves as the reference period), $income_decile_{i,t}$ denotes the income decile (the 5th income decile is the reference income group), $age_group_{i,t}$ denotes the age group (individuals aged 25-34 constitute the reference age group). β_1 measures the average post-2018 shift relative to 2017 common to all individuals. The coefficients β_2 to β_4 reflect changes in participation status associated with age, gender, and income. β_5 and β_6 illustrate heterogeneity across different income deciles and age groups, respectively. Importantly, because the reform is applied economy-wide, the estimated effects should be interpreted as evidence of differential behavioural adjustment across groups with varying exposure to contribution caps and eligibility constraints, rather than as causal effects derived from

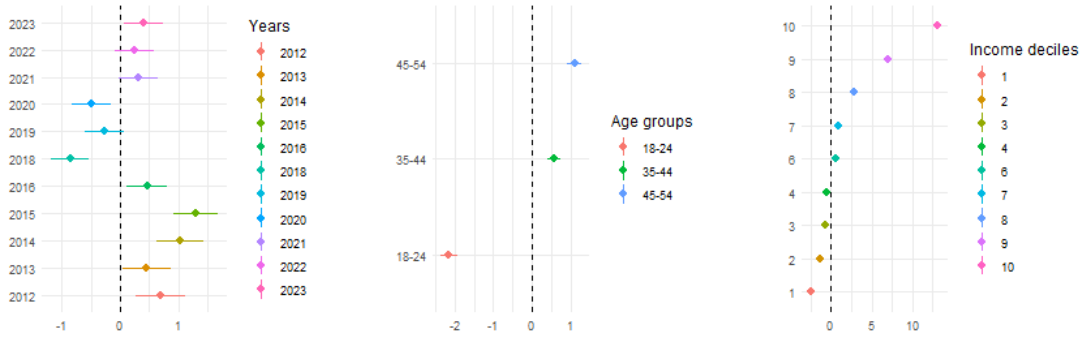
an untreated control group. Entry and exit probabilities are estimated using pooled OLS.

Entry

Figure 8 reports the estimated effects of the 2018 reform on the probability of entry into tax-favoured saving schemes, controlling for age, income, and gender fixed effects. The results indicate a clear downward shift in entry probabilities starting in 2018 relative to the 2017 baseline by around 1 percentage point (Figure 8, panel (a)). Relative to the average entry probability in 2017 of 5.7%, the decline is equivalent to a reduction of 17.5%. The persistence of this pattern in subsequent years suggests a sustained post-reform adjustment in entry behaviour rather than a purely transitory short-term response. This pattern is consistent with the reform reducing the overall attractiveness of entering tax-favoured saving schemes by tightening contribution limits and extending the minimum duration requirement for life insurance contracts.

Figure 8: Year, age group, and income fixed effects on entry into tax-favoured saving schemes

(a) year FE (base 2017), pp. (b) age FE (base 25-34), pp. (c) income decile FE (base 5), pp.

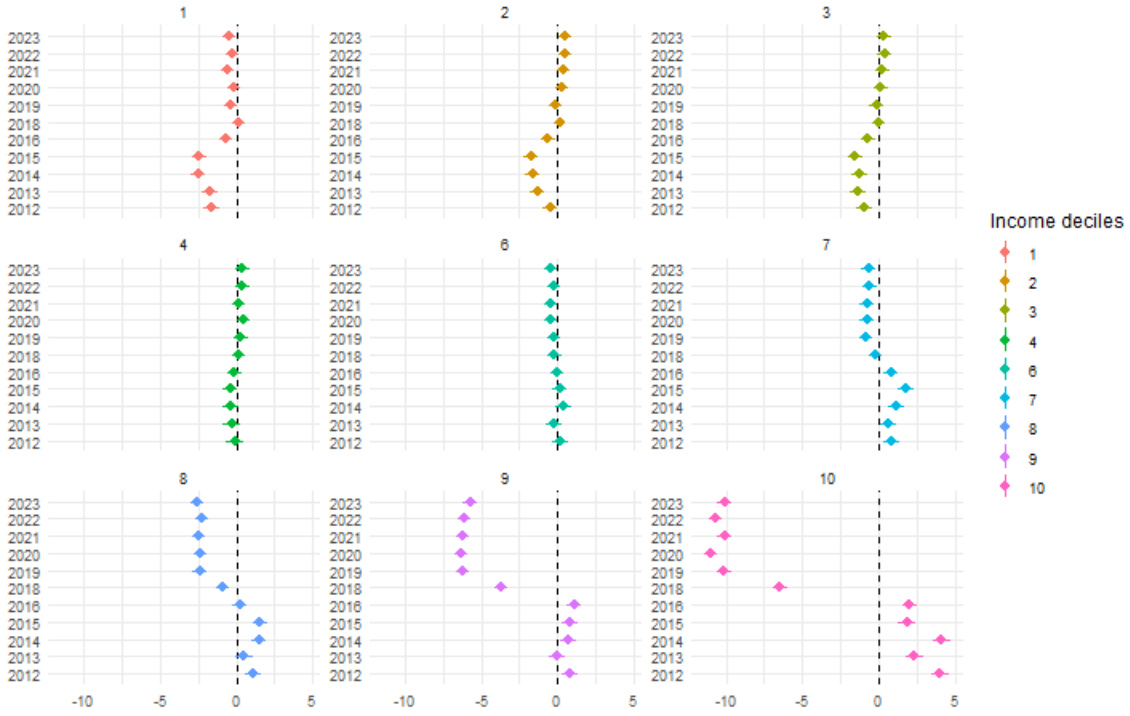


Notes: Panel (a) illustrates changes in the probability of entry relative to year 2017. Panel (b) illustrates the difference in entry probabilities across age groups relative to the age group 25-34. Panel (c) illustrates the difference in entry probabilities across income deciles relative to the 5th income decile. These estimates are obtained controlling for year, age group, income decile, and gender fixed effects. The sample is restricted to individuals younger than 54. Point estimates and 95% confidence intervals are shown.

Figure 8, panel (b) shows that during the whole analysed period entry probabilities vary across age groups on average. Relative to individuals aged 25-34, those aged 18-24 are approximately 2 percentage points less likely to enter, whereas those aged 35-44 and 45-54 are around 0.4 and 1 percentage points more likely to do so. Panel (c) reveals a pronounced positive income effect: entry probabilities increase across income deciles, with individuals in the highest decile approximately 10 percentage points more likely to enter than those in the fifth decile. Relative to the average

probability to enter of 5.5% during the analysed period, this means that the probability of higher income individuals to enter into tax-favoured schemes is twice as high compared to an individual in the middle-income group.

Figure 9: Effect of the 2018 reform on entry into tax-favoured saving schemes: year and income decile interaction term, pp.



Notes: Estimated changes in the probability of entry following the 2018 reform, interacted with income decile indicators (reference year: 2017; reference decile: 5th, reference age group: 25-34). The sample is restricted to individuals younger than 54. Point estimates and 95% confidence intervals are shown.

Figure 9 present the estimated effects of the 2018 reform on entry into tax-favoured saving schemes, allowing the response to vary flexibly across income deciles. The decline in entry following the 2018 reform is strongly heterogeneous across the income distribution. The reduction in entry probabilities is particularly pronounced for individuals in the upper part of the income distribution, especially those in the 8th to 10th income deciles. For these groups, entry probabilities fall sharply relative to the 2017 baseline and remain persistently lower in subsequent years. In contrast, the estimated effects for middle- and lower-income deciles are substantially smaller and, in many cases, statistically indistinguishable from zero. This pattern is consistent with the reform disproportionately affecting individuals for whom the joint contribution cap and tighter limits were binding or

close to binding, and who therefore faced the largest reduction in the marginal tax advantage of participation.

To explore the heterogeneity of entry probability across income and age dimensions simultaneously, Figure A1 in the Appendix presents simple entry probability by age and income cohorts in the corresponding year. The probability is estimated for each age-income-year group as a share of new entrants in the total number of individuals who submitted an income declaration in the current year but have not contributed to the third pension pillar or life insurance during the previous years (since 2010). The plot shows that after the 2018 reform, the persistent strong decline in entry for higher income groups (8-10 deciles) is observed for all age groups. The probability of entry for these groups plunged by more than half and has since remained at a level comparable to the mid-income cohorts. For mid-income groups over 25 years of age, the effect of the reform on entry probability is weaker. At the same time, the probability of entry for the youngest (18-24) and least wealthy (1-4 deciles) cohorts has increased since 2018 from very low levels to levels comparable for other age categories of the same income group. This reflects learning about the availability of long-term saving products by younger generations.

Taken together, the results suggest that the 2018 reform is associated with lower participation primarily through reduced entry among high-income individuals and among those in their early-to-mid working careers.

The heterogeneous entry responses documented in Figure 9 and Figure A1 are closely aligned with existing evidence on how contribution caps and eligibility rules shape participation in tax-favoured retirement saving. In particular, the strong decline in entry among high-income individuals mirrors findings from Denmark, where reductions in contribution limits or tax subsidies disproportionately affected groups for whom the cap was binding or close to binding (Chetty et al. 2014, Christensen and Ellegaard 2023). The pronounced response among older individuals is also consistent with life-cycle considerations highlighted in the literature. Ayuso et al. (2019) show that participation responses to tax incentives are strongest at ages when individuals begin to engage actively with long-term saving decisions, while responses weaken both earlier in the life cycle and closer to retirement.

Exit

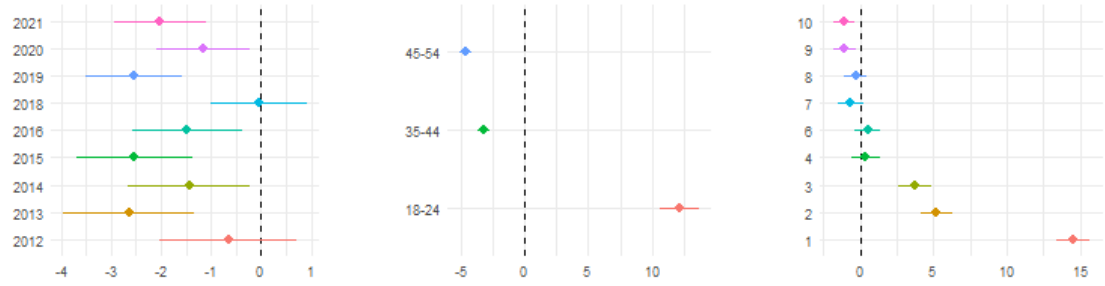
Figure 10, panel (b) shows that during the whole analysed period exit probabilities decline

with age on average. Relative to individuals aged 25-34, those aged 18-24 are approximately 12 percentage points more likely to exit, while those aged 35-44 and 45-54 are around 3 and 5 percentage points less likely to do so. Panel (c) indicates that exits are particularly prevalent among lower-income contributors: individuals in the lowest income decile are approximately 15 percentage points more likely to exit than those in the fifth decile. For those in the higher income deciles, the exit probabilities are only slightly smaller than those of the middle income individuals.

Panels (a) shows that the exit behaviour did not react to the 2018 reform. The probability of exit stayed at the level of 2017.

Figure 10: Year, age group, and income fixed effects on exit from tax-favoured saving schemes

(a) year FE (base 2017), pp. (b) age FE (base 25-34), pp. (c) income decile FE (base 5), pp.

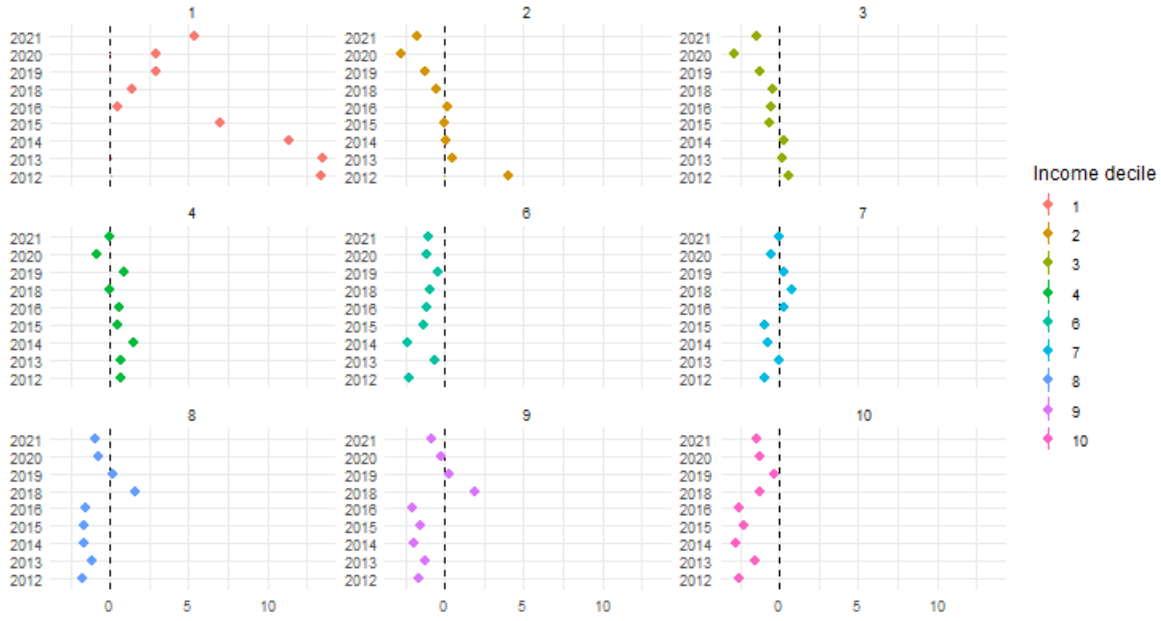


Notes: Panel (a) illustrates changes in the probability of exit relative to 2017. Panel (b) illustrates the difference in exit probabilities across age groups relative to the age group 25-34. Panel (c) illustrates the difference in exit probabilities across income deciles relative to the 5th income decile. These estimates are obtained controlling for year, age group, income decile, and gender fixed effects. The sample is restricted to individuals younger than 54. Point estimates and 95% confidence intervals are shown.

However, Figure 11 further explores heterogeneity in exit behaviour across the income distribution. The estimates reveal only limited and short-lived variation in exit probabilities by income decile. In some higher income deciles, exit probabilities rise modestly immediately after the reform, but these effects dissipate quickly and return close to pre-reform levels. For most income groups, the confidence intervals include zero throughout the post-reform period, indicating that the tightening of tax incentives did not trigger widespread disengagement from tax-favoured saving schemes.

Figure A2 additionally explores the heterogeneity of exit probability by age and income cohorts. Similar to the case of entry probabilities, the hike in exit probability in higher income groups in 2018 was observed across all age cohorts. The exit probability for the youngest cohort (18-24) is much higher compared with other age categories regardless of income group, showing that younger people show less persistent saving behaviour by failing to contribute regularly despite signing up to

Figure 11: Effect of the 2018 reform on the exit from tax-favoured saving schemes: year and income decile interaction term, pp.



Notes: Estimated changes in the probability of exit following the 2018 reform, interacted with income decile indicators (reference year: 2017; reference decile: 5th, reference age group: 25-34). The sample is restricted to individuals younger than 54. Point estimates and 95% confidence intervals are shown.

the programmes.

4.3 2018 Reform and the Behaviour of Maximizers

Empirical strategy

To assess how the 2018 reform affected individuals who previously maximized their tax refunds, we estimate the following model:

$$P_{i,t} = \beta_0 + \beta_1 \cdot post_t + \beta_2 \cdot treat_i + \beta_3 \cdot post_t \cdot treat_i + \beta_X \cdot X_{i,t} + \varepsilon_{i,t}, \tag{3}$$

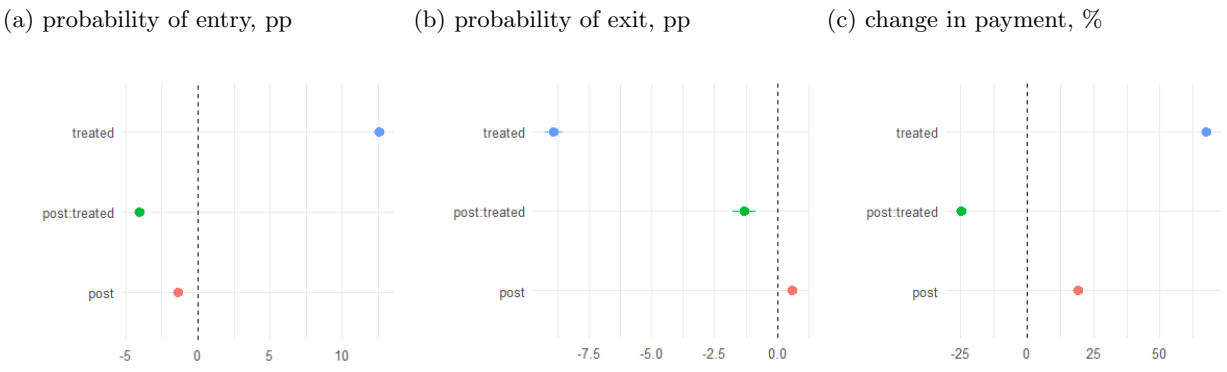
where $P_{i,t}$ denotes a change in participation status (exit, entry, payment), $post_t$ denotes an indicator for the years starting from 2018, $treat_i$ is an indicator for individuals (maximizers) who prior to the 2018 reform invested at or near the statutory tax-deductible threshold, and $X_{i,t}$ denotes a vector of controls. The parameter β_3 ($post : treated$) captures the differential post-2018 adjustment of pre-reform maximizers relative to other contributors.

We restrict the sample to the two years before and after the reform (2016–2019) when estimating this equation and to those aged below 54. Probabilities of entry and exit are estimated using pooled OLS, while changes in contribution amounts are estimated using panel FE estimation. Because maximizer status is defined based on pre-reform behaviour, the estimated differences should be interpreted with caution. In particular, the estimates may reflect both reform-induced changes in incentives and selection effects, whereby individuals engaging primarily in tax optimisation are less likely to enter or remain active once the policy environment changes.

Results

Figure 12 presents the estimated effects of the 2018 reform on individuals classified as maximizers, i.e. those contributing at or near the statutory tax-deductible threshold prior to the reform. This group represents a small but economically important segment of contributors as they account for a disproportionate share of total contributions and are most likely to adjust behaviour in response to changes in tax incentives.

Figure 12: Estimation results for maximizers



Notes: All panels illustrate estimates of the local average treatment effect comparing maximizers to other individuals before and after the 2018 reform. Outcomes include the probability of entry (panel (a)), probability of exit (panel (b)), and log contributions (panel (c)). Point estimates and 95% confidence intervals are shown.

The results indicate a pronounced behavioural response along multiple margins. First, the probability of entry among maximizers declined significantly after 2018. The estimated decline is 4 percentage points, equivalent to a relative reduction of 23.3%. This suggests that individuals who previously would have entered the scheme specifically to exploit generous contribution limits or refund opportunities were significantly less likely to initiate participation once the joint cap and stricter eligibility conditions were introduced. In contrast to the broader population analysed in

Section 4.2, where entry declines are concentrated among particular income and age groups, the response among maximizers is both larger in magnitude and more uniform, consistent with their heightened sensitivity to taxation legislation.

Second, the probability of exit among maximizers declined following the reform. It fell from a pre-reform level of 1% to almost zero. The most economically meaningful adjustment occurs along the intensive margin. Contribution amounts among pre-reform maximizers fall sharply after 2018 (by around 25%), indicating that even those who continue to participate substantially scale back contributions when the marginal tax advantage is reduced. This result underscores that the reform did not merely affect participation decisions but also altered the scale of the saving conditional on participation. In combination with the entry and exit results, this finding suggests that the 2018 reform effectively compressed the upper tail of the contribution distribution, reducing high-intensity, tax-driven contributions.

These findings closely align with existing evidence that reductions in tax subsidies or contribution caps disproportionately affect individuals who are actively engaged in tax planning. Chetty et al. (2014) show that contributors who make active adjustments to their pension accounts respond strongly to changes in incentives, while more passive participants exhibit inertia. Similarly, Christensen and Ellegaard (2023) document sizeable contribution reductions among groups close to binding caps following a Danish reform that reduced contribution limits. The Latvian evidence extends these insights by showing that when tax incentives are tightened, opportunity-seeking behaviour can be reduced without triggering widespread exits, thereby improving the targeting of fiscal support toward genuinely long-term saving motives.

5 Income Elasticity and Adjustment Dynamics of Contributions

While the analysis in Section 4 focuses on participation decisions, i.e., entry, exit, and the composition of contributors, the overall effectiveness of tax-favoured saving schemes also depends critically on how contribution levels adjust once individuals participate. In this section, we therefore examine behavioural responses along the intensive margin, focusing on the income elasticity of contributions and the dynamics of contribution adjustment over the participation lifecycle. Understanding these patterns is essential for interpreting the participation effects documented earlier: if contributions do not adjust with income over time, reduced entry may have limited long-run consequences for aggre-

gate saving; conversely, if contributions respond strongly to income growth, participation declines may have persistent effects. Using fixed-effects panel regressions, we first estimate baseline income elasticities and their heterogeneity across age, maximizer status, and participation duration, and then assess how these elasticities and adjustment paths changed following the 2018 reform.[4]

Equation 4 provides a baseline estimate of the average income elasticity of contributions, exploiting within-individual variation in taxable income over time.

$$ln(Payment)_{i,t} = \beta_0 + \beta_1 \cdot ln(Taxable_income)_{i,t} + \beta_X \cdot X_{i,t} + \gamma_t + \omega_i + \varepsilon_{i,t}, \tag{4}$$

where $ln(Payment)_{i,t}$ denotes the log of payment into both tax-favoured schemes, $ln(Taxable_income)_{i,t}$ represents the log taxable income of an individual, $X_{i,t}$ is a vector of controls - income decile and age group. γ_t and ω_i denote time and individual fixed effects, respectively. Robust standard errors are used. The sample is restricted to individuals with non-zero payments and taxable income.

The estimated elasticity β_1 of approximately 0.67 (Table 1, column 1) indicates that contributions rise less than proportionally with income. This finding suggests that, for the average participant, tax-favoured saving does not mechanically adjust one-for-one with earnings growth, consistent with the presence of contribution norms, institutional caps, or behavioural frictions that dampen intensive margin responses.

To assess whether this elasticity varies systematically across the life cycle, equation 5 allows income responsiveness to depend on the age of an individual ($age_{i,t}$).

$$\begin{aligned} \ln(\text{Payment})_{i,t} = \beta_0 + \beta_1 \cdot \ln(\text{Taxable_income})_{i,t} + \beta_2 \cdot \text{age}_{i,t} \\ + \beta_3 \cdot \ln(\text{Taxable_income})_{i,t} \cdot \text{age}_{i,t} + \beta_X \cdot X_{i,t} + \gamma_t + \omega_i + \varepsilon_{i,t}, \end{aligned} \tag{5}$$

The estimated coefficient β_3 on the interaction between income and age is negative and statistically significant (Table 1, column 2). It implies that income elasticity β_1 declines modestly as individuals are getting older. This pattern is consistent with life-cycle considerations: younger individuals may adjust contributions more flexibly as income rises, while older participants, especially those closer to retirement may face binding caps or have already reached target saving levels, reducing the scope for further adjustment.

Next, equation 6 explicitly tests whether income elasticity differs for maximizers, a group shown

[4]Rather than identifying causal reform effects, this section characterises how contribution behaviour and income elasticity evolve over time and across participant types, and how these patterns shift around the 2018 reform.

Table 1: Income elasticity of contributions and heterogeneity by age, maximizer status, and participation duration

Variables	(1)	(2)	(3)	(4)
Ln(Income)	0.672***	0.697***	0.581***	0.582***
Ln(Income)*Age		-0.001***		
Ln(Income)*Maximizers			0.216***	0.215***
Age		0.005***		
Maximizers			-1.231***	-1.225***
Participation duration				0.021***
Within R^2	0.051	0.052	0.162	0.163
Number of observations	1,798,555	1,798,555	1,798,555	1,798,555

Notes: Fixed-effects panel regressions of log contributions to tax-favoured saving schemes on log taxable income. Column (2) allows income elasticity to vary with age, column (3) with maximizer status, and column (4) with participation duration. All specifications include individual and time fixed effects as well as controls. Robust standard errors are used. The sample is restricted to individuals with non-zero payments and taxable income.

in previous sections to be particularly sensitive to tax incentives:

$$\begin{aligned}\ln(\text{Payment})_{i,t} = \beta_0 + \beta_1 \cdot \ln(\text{Taxable_income})_{i,t} + \beta_2 \cdot \text{max_dummy}_{i,t} \\ + \beta_3 \cdot \ln(\text{Taxable_income})_{i,t} \cdot \text{max_dummy}_{i,t} + \beta_X \cdot X_{i,t} + \gamma_t + \omega_i + \varepsilon_{i,t},\end{aligned} \tag{6}$$

where $max_dummy_{i,t}$ is a dummy variable which takes the value 1 if an individual is a maximizer, i.e. the one who prior to the 2018 reform contributed at or near the statutory tax deductible threshold and 0 otherwise.

The estimated coefficient β_3 on the interaction between income and maximizer status is positive and statistically significant (Table 1, column 3), implying that maximizers exhibit substantially higher income elasticity than other participants. This result provides a crucial link between the participation evidence in Section 4 and contribution behaviour: individuals most engaged in tax optimisation not only adjust entry and exit decisions but also scale contributions more aggressively as income grows.

Additionally, equation 7 introduces participation duration to distinguish income-driven adjustments from gradual accumulation dynamics.

$$\begin{aligned}\ln(\text{Payment})_{i,t} = \beta_0 + \beta_1 \cdot \ln(\text{Taxable_income})_{i,t} + \beta_2 \cdot \text{max_dummy}_{i,t} \\ + \beta_3 \cdot \ln(\text{Taxable_income})_{i,t} \cdot \text{max_dummy}_{i,t} + \beta_4 \cdot \text{duration}_{i,t} \\ + \beta_X \cdot X_{i,t} + \gamma_t + \omega_i + \varepsilon_{i,t},\end{aligned} \tag{7}$$

where $duration_{i,t}$ is the number of years an individual has contributed to the scheme.

The positive coefficient on the duration of participation β_4 indicates that contributions increase systematically the longer an individual remains in the scheme (Table 1, column 4). This finding suggests a catching-up process, whereby participants gradually raise contributions over time, even after conditioning on income growth and maximizer status. Importantly, controlling for duration leaves the income elasticity and maximizer interaction largely unchanged, reinforcing the interpretation that income responsiveness and participation tenure capture distinct behavioural channels.

Having established substantial heterogeneity in the adjustment of individual contributions across age, maximizer status, and participation duration, we next examine whether the responsiveness of contributions to income changed following 2018, i.e. after the latest reform. This question is central for assessing whether the reform merely reduced participation or also altered the intensive margin sensitivity of contributions among remaining participants. Equation 8 allows income elasticity to vary flexibly over time by interacting taxable income with year and with year and maximizer status.

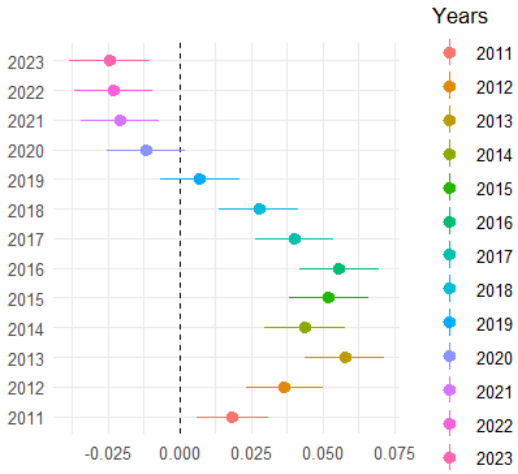
$$\begin{aligned}\ln(\text{Payment})_{i,t} = \beta_0 + \beta_1 \cdot \ln(\text{Taxable_income})_{i,t} \cdot \text{year}_t \\ + \beta_2 \cdot \ln(\text{Taxable_income})_{i,t} \cdot \text{year}_t \cdot \text{max_dummy}_{i,t} \\ + \text{other_interaction_terms} + \beta_X \cdot X_{i,t} + \gamma_t + \omega_i + \varepsilon_{i,t},\end{aligned} \tag{8}$$

The estimation results are illustrated in Figure 13, revealing two distinct patterns. Panel (a) shows that income elasticity increased during the first half of the 2010s before declining ahead of the 2018 reform, with the downward trend continuing thereafter. One possible explanation for the earlier increase is the expansion of life insurance products, supported by active commercial banks' promotional campaigns. The subsequent decline may partly reflect the waning influence of these campaigns, while the tightening of tax incentives in 2018 may have reinforced a previously established trend. Panel (b), by contrast, shows a pronounced decline in the additional income elasticity of maximizers in 2018, following a relatively stable pre-reform period. This sharper change is consistent with the 2018 reform establishing the joint contribution cap and the absolute annual ceiling. Both limited the scope for contributions to rise with income among individuals contributing

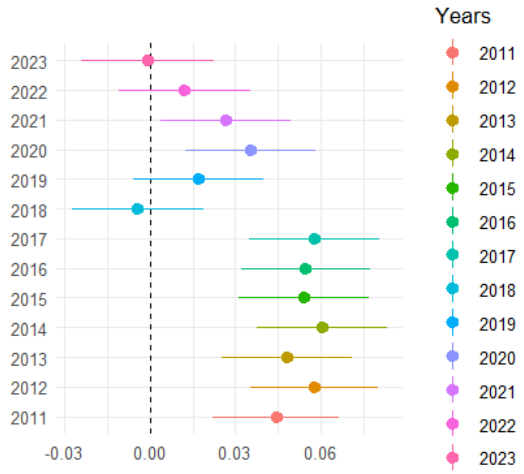
close to the tax-deductible limits.

Figure 13: Evolution of income elasticity of contributions over time (1=100%)

(a) extra effect of growth in income



(b) extra effect of being a maximizers



Notes: This figure illustrates the estimated income elasticity of contributions to tax-favoured saving schemes by year, based on interactions between log taxable income and year indicators (reference year: 2010). Panel (b) also reports the additional income responsiveness of maximizers relative to other contributors. Point estimates and 95% confidence intervals are shown.

While the decline in income elasticity points to reduced responsiveness among existing participants, it is also important to understand how contribution behaviour evolves among new entrants. Equation 9 therefore focuses on the relative contribution intensity of newcomers by comparing their payment-to-income ratios with those of continuing participants.

$$\ln(\text{Payment_to_Income})_{i,t} = \beta_0 + \beta_1 \cdot \text{new_participant_dummy}_{i,t} + \beta_X \cdot X_{i,t} + \gamma_t + \omega_i + \varepsilon_{i,t}, \tag{9}$$

where $new_participant_dummy_{i,t}$ takes the value 1 if an individual is a new participant, and 0 otherwise.

Table 2 shows that new participants contribute, on average, around 1.3 percentage points less of their income than established contributors. This initial gap suggests that entry into tax-favoured saving schemes is typically characterised by cautious or partial engagement rather than immediate convergence to long-run contribution levels.

Finally, equation 10 explores how quickly the gap presented in Table 2 closes.

Table 2: Contribution intensity of new participants relative to existing contributors

Variables	All years
New participation	-0.0133***
Adj. R^2	0.033
Number of observations	1,798,555

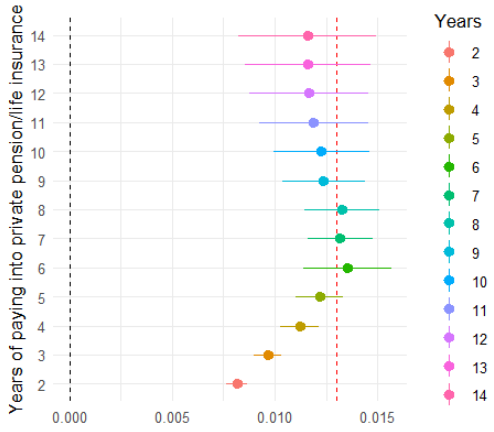
Notes: Fixed-effects regression of the payment-to-income ratio on a new-participant indicator. The coefficient captures the average difference in contribution intensity between new participants and continuing contributors. The specifications include standard controls. Robust standard errors are used.

$$\ln(\text{Payment_to_Income})_{i,t} = \beta_0 + \beta_1 \cdot \text{duration}_{i,t} + \beta_X \cdot X_{i,t} + \gamma_t + \omega_i + \varepsilon_{i,t}, \tag{10}$$

where $duration_{i,t}$ is the number of years an individual has contributed to the scheme.

Figure 14 demonstrates that this gap narrows gradually over time and closes only after approximately five years of participation.

Figure 14: Convergence of contribution intensity among new participants



Notes: Estimated difference in the payment-to-income ratio between new participants and existing contributors by participation duration. The figure illustrates the speed at which the contribution intensity of newcomers converges to that of established participants. The estimation includes the individual fixed effect in addition to standard controls. The sample restricted to non-zero contributions and taxable income. Point estimates and 95% confidence intervals are shown.

Taken together, results highlight a gradual adjustment process on the intensive margin. New participants do not immediately scale contributions to levels observed among long-standing contributors; instead, contribution intensity increases slowly as individuals accumulate experience within the scheme. This pattern complements the inertia observed on the extensive margin in Section 4

and reinforces the broader interpretation that behavioural frictions play a central role in shaping long-term saving behaviour. Importantly, the combination of declining income elasticity after 2018 and slow convergence among newcomers has direct policy implications. Reforms that reduce entry are likely to have persistent effects on aggregate contributions, not only because fewer individuals participate, but also because those who do enter contribute relatively little in the early years. Consequently, policies that broaden participation may yield substantial long-run gains in aggregate saving, even if initial contribution levels are modest.

6 Conclusions

This paper studies how changes in tax incentives shape voluntary long-term saving behaviour, using the 2017–2018 personal income tax reforms in Latvia. Exploiting administrative tax declaration data covering more than a decade, it examines behavioural responses along both the extensive margin, i.e. participation, entry, and exit, and the intensive margin, i.e. contribution levels and income elasticity. Three main findings emerge as the result of the study.

First, reforms that directly eliminate short-term tax optimisation opportunities generate sharp and targeted responses. The 2017 reform, which restricted withdrawal opportunities for individuals aged 55 and over, led to a pronounced decline in entry and high-intensity contribution behaviour among older individuals, accompanied by a more modest increase in exits. The strongest response occurred along margins requiring active decision-making, entry and maximisation of contributions, while many existing participants remained inert.

Second, when tax incentives are tightened economy-wide through contribution caps and longer minimum holding periods, behavioural adjustment operates primarily through reduced entry rather than mass exits. Following the 2018 reform, entry into tax-favoured saving schemes declined sharply and persistently, while the reform did not trigger an exit response. The entry response was concentrated among high-income individuals in all age cohorts. The probability to enter and contribution amounts for people investing at the maximum level declined the most. Back-of-the-envelope calculations suggest that the 2018 reform reduced personal income tax refunds by approximately 5.3 million euro, equivalent to around 25% of total budget expenditure on personal income tax refunds for payments to private pension plans and life insurance schemes.

Third, contribution behaviour among participants is characterised by gradual adjustment, sub-

stantial heterogeneity, and declining income responsiveness after 2018. Using fixed-effects panel regressions, we show that contributions rise less than proportionally with income, that income elasticity is higher among tax-sensitive maximizers and lower at the later stages of the life cycle, and that contributions increase with participation duration. New entrants initially contribute substantially less than established participants and converge over several years.

References

Attanasio, O. and T. DeLeire (1994). IRAs and household saving revisited: some new evidence. NBER Working Paper No. 4900.

Ayuso, J., J. F. Jimeno, and E. Villanueva (2019). The effects of the introduction of tax incentives on retirement saving. *SERIEs 10*(3), 211–249.

Chan, M. K., T. Morris, C. Polidano, and H. Vu (2022). Income and saving responses to tax incentives for private retirement savings. *Journal of Public Economics 206*, 104598.

Chetty, R., J. N. Friedman, S. Leth-Petersen, T. H. Nielsen, and T. Olsen (2014). Active vs. passive decisions and crowd-out in retirement savings accounts: evidence from Denmark. *The Quarterly Journal of Economics 129*(3), 1141–1220.

Christensen, C. S. and B. E. Ellegaard (2023). Do tax subsidies for retirement saving affect total private saving? New evidence on middle-income workers. *The Scandinavian Journal of Economics 125*(4), 933–955.

Engen, E. M., W. G. Gale, J. K. Scholz, B. D. Bernheim, and J. Slemrod (1994). Do saving incentives work? *Brookings Papers on Economic Activity 1994*(1), 85–180.

Fadejeva, L. and O. Tkacevs (2022). The effectiveness of tax incentives to encourage private savings. *Baltic Journal of Economics 22*(2), 110–125.

Gale, W. G. and J. K. Scholz (1994). IRAs and household saving. *The American Economic Review*, 1233–1260.

Gelber, A. M. (2011). How do 401(k)s affect saving? Evidence from changes in 401(k) eligibility. *American Economic Journal: Economic Policy 3*(4), 103–122.

Hecht, C. and K. Hanewald (2012). Who responds to tax reforms? Evidence from the life insurance market. *The Geneva Papers on Risk and Insurance-Issues and Practice 37*(1), 5–26.

Jappelli, T. and L. Pistaferri (2003). Tax incentives and the demand for life insurance: evidence from Italy. *Journal of Public Economics 87*(7-8), 1779–1799.

Poterba, J. M., S. F. Venti, and D. A. Wise (1995). Do 401(k) contributions crowd out other personal saving? *Journal of Public Economics 58*(1), 1–32.

Poterba, J. M., S. F. Venti, and D. A. Wise (1996). How retirement saving programs increase saving. *Journal of Economic Perspectives 10*(4), 91–112.

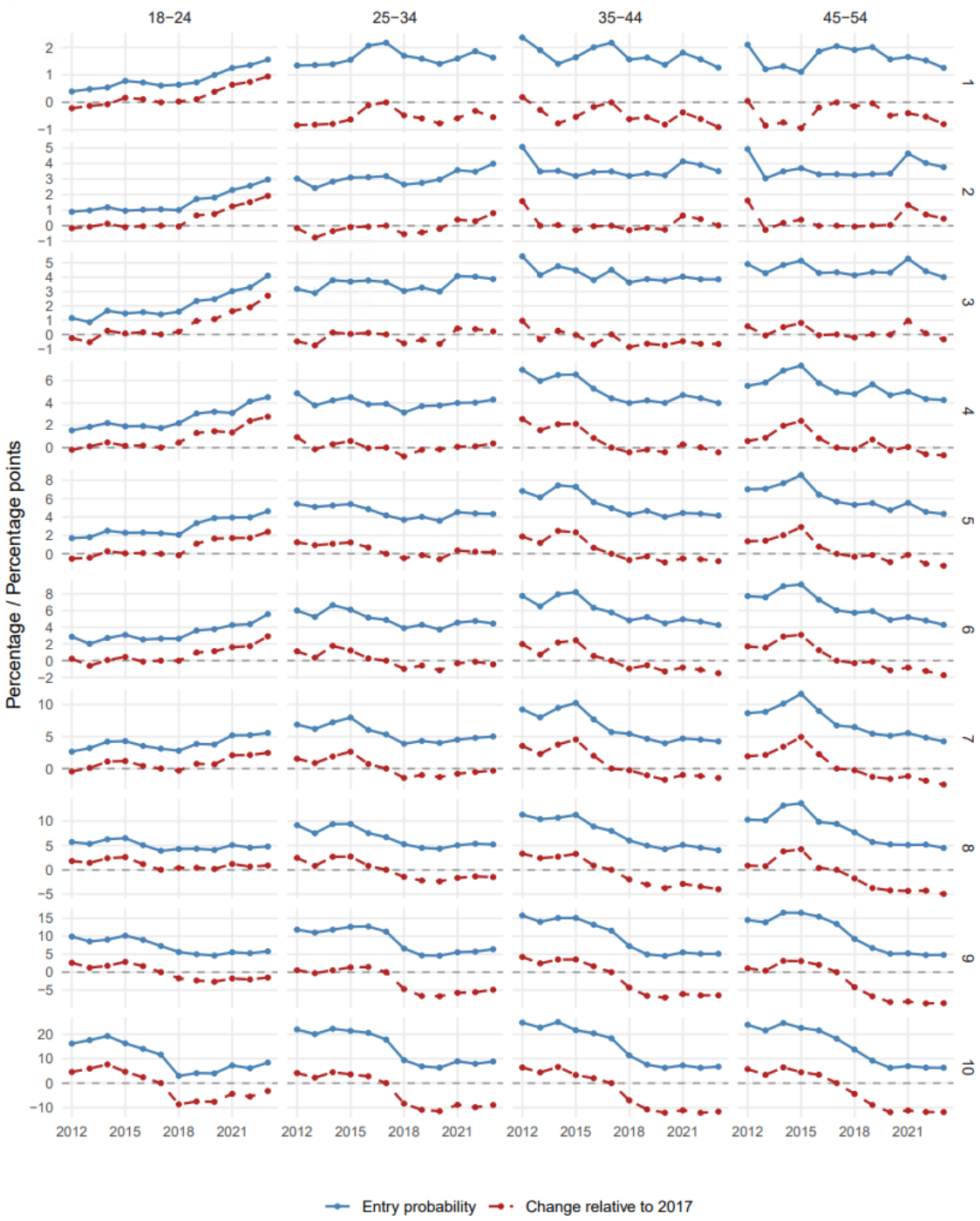
Sauter, N., J. Walliser, and J. Winter (2015). Tax incentives, bequest motives, and the demand for life insurance: evidence from a natural experiment in Germany. *Journal of Pension Economics & Finance 14*(4), 525–553.

Venti, S. F. and D. A. Wise (1986). Tax-deferred accounts, constrained choice and estimation of individual saving. *The Review of Economic Studies 53*(4), 579–601.

Venti, S. F. and D. A. Wise (1990). Have IRAs increased US saving? Evidence from consumer expenditure surveys. *The Quarterly Journal of Economics 105*(3), 661–698.

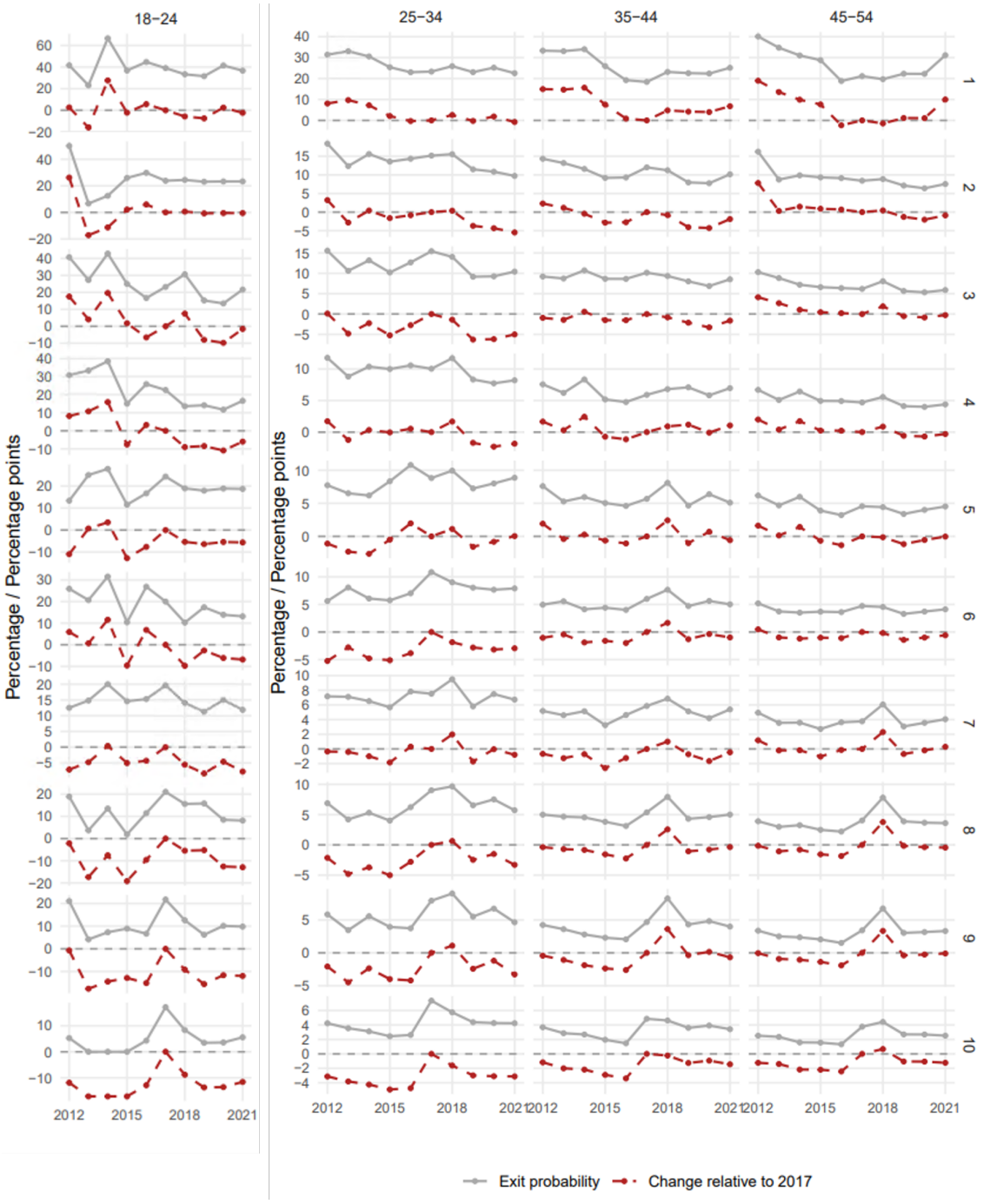
Appendix

Figure A1: Probability of entry by age and income decile cohorts



Notes: The probability of entry in a given year is estimated for each income-age cohort separately by dividing the number of new entrants in the corresponding year and cohort by the total number of people who submitted income declaration in the current year but have not contributed to the third pension pillar or life insurance in the previous years (since 2010). Change relative to 2017 is the difference between the probability of entry in the corresponding group and year minus the value in 2017.

Figure A2: Probability of exit by age and income decile cohorts



Notes: The probability of exit in a given year is estimated for each income-age cohort separately by dividing the number of exiters in the corresponding year and cohort by the total number of people who have contributed to the third pension pillar or life insurance in the previous year. Change relative to 2017 is the difference between the probability of entry in the corresponding group and year minus the value in 2017.