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THE DECISION TO SAVE: EXTENSIVE AND (SUBSIDIZED) INTENSIVE MARGIN ON HOUSEHOLD PARTICIPATION IN GERMANY'S THIRD-PILLAR PENSION

Abstract:

This paper provides new evidence on Germany's third-pillar pensions by separating market entry from within-pillar product choice and by introducing an aggregated subsidized margin that summarizes selection into Riester/Basis relative to purely unsubsidized Private plans. Using recent, nationally representative microdata (2019–2023), we estimate a two-stage framework: a binary participation model and, conditional on entry, a multinomial product-choice mode. Two contributions are distinctive. First, we provide the first unified evidence on Basis and unsubsidized Private contracts alongside Riester, moving beyond a Riester-centric literature. Second, our subsidized margin offers a policy-relevant measure of how fiscal incentives reallocate choices within the pillar, invariant to base-category normalization. At the extensive margin, participation is governed primarily by labor-market attachment and position in the income distribution. Households with stable earnings and strong links to formal employment are much more likely to enter, while low and irregular earners remain underrepresented. Participation exhibits a reverse gender gap: women outpace men in third-pillar take-up. At the intensive margin, choices track institutional design. Higher incomes tilt selections away from allowance-based contracts and toward tax-deductible alternatives, with the self-employed showing a marked preference for the latter. On the subsidized margin, income effects largely offset in the aggregate, yet the nature of earnings remains decisive. These findings point to policy that targets entry frictions and preserves product neutrality because participation and not within-pillar reallocation is the margin on which the system binds.

Keywords:

Third-Pillar Pension, Riester Pension, Basis Pension, Rürup Pension, Private Pension, Retirement Saving, Subsidies and Tax Incentives, Household Finance, Extensive and Intensive Margins

JEL Classification: D14, G22, H55

1. Introduction

Germany's statutory pay-as-you-go (PAYG) pension system is under mounting pressure. Long-term projections forecast a substantial decline in the replacement rate posing challenges to the adequacy of public retirement income. Higher life expectancy, declining fertility rate, increasing average age of mother at birth and reform dependence on political cycles are the main challenges why it is forecasted that pension level will decrease from approximately 48% in 2025 to 43% in 2060 while contribution rate needs to rise from 18.6 % in 2025 to 25% in 2060 to finance the public pension system (Werding and Läpple, 2021; Rotschedl et al. 2024). This trend was anticipated by German politicians already in the late 1990s thus the Retirement Assets Act (AVmG), passed in 2001, paved the way for new complementary pillars. Since 2002, the statutory pension has been supplemented by a funded occupational and private provision schemes creating the second and third pillar of Germany's pension system. In response to the Retirement Asset Act, the official German Pension Information explicitly recommends that individuals supplement public pensions with private responsibility via second- and third-pillar retirement savings. The pension information is sent automatically by the German Pension Insurance to all insured persons who have reached the age of 27 and have paid contributions to the statutory pension for at least five years. This applies to both employees subject to mandatory contributions and self-employed making voluntary contributions. Consequently, both pillars receive extensive promotion, and the impact is evident in 2024, with 16.55 million active second-pillar contracts and 42.18 million third-pillar contracts (Gesamtverband der Deutschen Versicherungswirtschaft e.V. (GDV), 2025).

Although this policy shift acknowledges the growing need for self-directed pension planning and strengthens the supply infrastructure, identifying the determinants of voluntary take-up using representative household data has become increasingly important. While the supply side has matured, we know comparatively little beyond a Riester-centric literature about participation in the third pillar and how participants allocate across Riester, Basis (formerly Rürup), and unsubsidized Private pension[1]. This paper closes a key evidence gap by leveraging recent, representative microdata within a unified two-stage framework. It characterizes the extensive margin of third-pillar participation as a function of socioeconomic characteristics, and, conditional on entry, maps the intensive margin of product choice across Private, Riester, and Basis. It further introduces a subsidized intensive margin that aggregates Riester and Basis to isolate how fiscal incentives reallocate choices within the pillar. Together, these components quantify who participates and how institutional design and household heterogeneity shape allocation in Germany's third pillar.

The remainder of the paper outlines the institutional background and related literature, then describes the data and empirical framework before presenting the extensive-margin results, the intensive- and subsidized-intensive-margin results, and the conclusion.

2. Third-Pillar Pension Germany

Germany's old-age security is structured into a three-pillar model, a design encouraged by the World Bank's multi-pillar approach (World Bank, 1994; Holzmann 1998). The first pillar constitutes the mandatory public PAYG pension, a Bismarckian earnings-related system, supplemented by a second pillar of occupational pensions, and a third pillar of voluntary private retirement savings. This multi-tier arrangement combines elements of Bismarck's contributory social insurance with

[1] Terminology: Private pension (capitalized) denotes the non-subsidized product type within Germany's third pillar. In contrast, private pension (lowercase) refers generically to the third pillar as a whole.

Beveridge's notion of individual provision, aiming to diversify sources of retirement income. To this end, new state-subsidized retirement products were introduced to fill the emerging pension gap caused by lower public replacement rates bearing the policy rationale (Sinn, 2000; Börsch-Supan et al. 2016). The impetus for strengthening the third pillar came with the Altersvermögensgesetz (2001) by introducing Riester in 2002 and later with the Alterseinkünftegesetz (2004) by introducing Basis in 2005. Its intended role is thus complementary: the third pillar was meant to serve as a voluntary, funded supplement for individuals to maintain their living standards in old age despite a retrenchment of the first pillar (Börsch-Supan and Wilke, 2004). In summary, Germany's third-pillar reform was part of a global trend of strengthening private pensions to complement public systems (Holzmann and Hinz, 2005). Germany took a voluntary, state-subsidized approach the government providing incentives for individuals to opt in, rather than mandating private savings. The following subsections describe the key third-pillar instruments Riester, Basis/Rürup and Private pension and reviews the intended target group and institutional design.

2.1 Riester Pension

The Riester pension is a voluntary state-subsidized defined-contribution contract, certified to statutory standards. Certification makes contributions eligible for subsidies. Products must preserve, at retirement, at least the sum of own contributions and state allowances and pay benefits as a life annuity with up to 30% commutable at retirement. Through tight regulation, a capital-preservation guarantee, and matching-style co-funding, Riester is designed as a supplement to the statutory pension to offset reform-induced benefit cuts.

Certified product formats include traditional insurance annuities, fund-linked policies with capital-preservation floors, bank savings plans, and the housing variant (Wohn-Riester). For insurers, the guarantee is constrained by the statutory maximum technical interest rate (Höchstrechnungszins), which shapes reserve requirements and risk budgets. However, high administrative complexity and fixed costs stemming from fees and regulation disproportionately deter low-income and low-literacy households, offsetting subsidies and aligning with evidence on financial literacy and fee effects in individual pensions (Bucher-Koenen and Lusardi, 2011; Börsch-Supan et al., 2012).
These products primarily target employees in the statutory pension system, whose future benefits were reduced by reform, along with their non-employed spouses and civil servants. The self-employed are generally excluded, except when covered by statutory insurance or via a spouse. The scheme focuses on low- to middle-income families with children, combining flat grants, a basic allowance, and per-child supplements with tax deductibility of contributions up to €2,100 annually including grants. Tax relief follows the "Günstigerprüfung" rule, granting households the more valuable of the deduction or the flat grants. Child allowances amount to €185 annually for children born before 2008 and €300 thereafter, paid per child if contributions exceed €60/year. Full subsidies require contributions of 4% of the prior year's income thus incentives are most generous for low-income families.

Despite substantial subsidies, Riester plan uptake has varied markedly across socioeconomic groups. After a slow launch in 2002–2003, product adjustments and intensive marketing spurred rapid enrollment growth (Börsch-Supan et al., 2012). Contracts in force rose to 14.5 million by 2010, peaked at 16.6 million in 2017, and declined to 14.9 million by 2024 (BMAS, 2025). Early participation was highly skewed: only about 19% of the lowest-income households held a Riester contract, compared with nearly 50% in the top income brackets (Börsch-Supan et al., 2012), and coverage in the bottom quintile subsequently fell further (Geyer et al., 2021). While child subsidies increased take-up among families in general, the effect was concentrated among middle-income families; the low-income families participated least. Higher-income and better-educated individuals were more likely to acquire Riester contracts, whereas low education, low earnings,

and employment interruptions were associated with sharply lower participation (Börsch-Supan et al., 2016; Geyer et al., 2021). Persistent public skepticism about the profitability of Riester products contributed to a marked slowdown in new contracts after the initial expansion (Kuper and Schmidt, 2016).

2.2 Basis Pension

Germany's least-used third-pillar vehicle is the Basis pension, introduced in 2005 to provide tax-privileged retirement saving for self-employed professionals and high-income earners excluded from, or seeking to supplement, the statutory pension system. Unlike Riester plans, Basis contracts do not offer direct state allowances; the incentive derives solely from income tax deductibility. These contracts function as individual private annuities with deferred taxation, receiving treatment broadly analogous to first-pillar pensions. In 2025, contributions to a certified Basis plan are fully deductible up to €29,344 for singles, with lower percentages in earlier years as limits were phased in. Contributions accumulate free of current income tax until retirement, when benefits are taxed as regular pension income.

Design restrictions mirror public pensions: funds are locked until statutory retirement age, cannot be surrendered early, and must be disbursed as a non-transferable, lifelong annuity. The absence of a lump-sum option and the prohibition on inheritance underscore the program's aim to provide stable old-age income rather than liquid savings. The policy's original purpose was to reach groups not benefiting from Riester most notably, self-employed and freelance workers not mandatorily insured in the public system, and thus ineligible for Riester subsidies. Basis also appeals to high-earning employees and civil servants wishing to save beyond Riester's €2,100 annual limit. Its economic advantage rises steeply with marginal tax rates: a top-bracket contributor saves 42% of each euro contributed, while a low earner might save 0–20% and potentially gain more from Riester allowances (Fischer and Hoberg, 2005). Unlike Riester's progressive subsidy schedule, Basis relies on a traditional, regressive-leaning tax incentive mechanism.

The Basis pension market has expanded steadily, though it remains much smaller than Riester in absolute terms despite universal eligibility. Contracts in force rose from 1.3 million in 2010 to 2.8 million by 2024 (GDV, 2025), indicating gradual but accelerating growth in recent years, the inverse of Riester's early surge followed by contraction. Basis savers are predominantly self-employed individuals, professionals, and high-income employees; insurers report notable uptake among civil servants seeking additional tax deductions and well-paid employees without other pension channels (GDV, 2025). Without a state-subsidy component, demand is driven largely by financial planning considerations: reducing taxable income during working life and securing an additional retirement income stream. The contrasting designs of Riester and Basis segment the third-pillar market into largely distinct participant groups with limited overlap. While Riester has received extensive scholarly attention, research on Basis is scarce; Kuper (2017) provides the first empirical analysis of its uptake and characteristics while Fischer and Hoberg (2005) soely focus on its taxation.
Structurally, Riester contributions are made from post-tax income and offset ex post via allowances or tax refunds, whereas Basis contributions are deducted pre-tax. At retirement, both are fully subject to income taxation under the same rules as public pensions. Blaufus and Milde (2018) show, that deferred taxation can lead to substantial tax misperceptions which hold especially for low tax and financial knowledge persons and remain stable eventhough they gain experience. To avoid such missperceptions, an unsubsidized Private pension product is also available within the third pillar.

2.3 Private Pension

Beyond Riester and Basis, Germany's third pillar includes a broad spectrum of non-subsidized private pension products. These encompass traditional endowment life insurance policies, private annuities not certified under Riester or Basis, bank-administered retirement savings plans, and investment funds earmarked for old-age, and other long-term household financial assets. Such vehicles predate the Riester reform, life insurance and building society savings have long served as de facto retirement savings instruments. Their defining characteristic is the absence of targeted state support. No direct subsidy and no preferential tax treatment beyond general tax rules.

In this study, we focus on Private pensions that are structurally similar to Riester and Basis in offering contractual old-age income streams, but differ fundamentally in fiscal treatment. These products receive no allowances or upfront tax deductions. Instead, they offer high contractual flexibility: contribution amounts are unrestricted, early liquidation is generally permitted, and individuals can choose payout modalities (lump sum, annuity, or hybrid structures). The absence of fiscal incentives is thus offset by liquidity and customization advantages. Private annuities, offered outside the Riester/Basis framework, appeal to those seeking supplementary lifetime income without regulatory constraints. Taxation also differs: while Riester and Basis are deferred-taxation products (tax-exempt during accumulation, fully taxed in retirement), unsubsidized private annuities tax only the interest component of payouts, often resulting in a lower effective tax rate. This creates a trade-off between upfront incentives and long-term flexibility, influencing preferences for subsidized versus unsubsidized instruments.

The target group for non-subsidized private pensions typically comprises financially literate, higher-income individuals, including those who have exhausted subsidized allowances and seek to augment retirement savings beyond those limits. Dual-earner couples with high disposable income may choose Private pension to pursue higher expected returns unconstrained by Riester's contribution caps. Individuals skeptical of state-administered programs may also prefer fully Private accounts under their control. Industry data confirm the scale and persistence of this segment: the number of non-subsidized private pension contracts rose from 35.2 million in 2010 to 48.5 million in 2024 (GDV, 2025), continuing a growth trend that predates subsidized schemes. Contracts numbered 1.6 million in 1990 and 10.6 million by 2010, making this historically the largest component of the third pillar for more than three decades. Many households diversify across multiple instruments, about one quarter held at least two different old-age savings products by 2009 (Börsch-Supan et al., 2012).
Participation patterns reveal pronounced socioeconomic selectivity. Data from the German Household Finance Survey show that income and disposable household resources significantly increase both participation likelihood and contribution intensity, while migrants and residents of Eastern Germany participate less frequently (Kalckreuth et al., 2012; Metzger, 2017). Cross-national SHARE evidence corroborates this gradient: between 2006 and 2021, individuals in upper-service occupations and higher income quintiles in Germany were significantly more likely to hold Private pension contracts (Gonzales and Fernández, 2024). Overall, non-subsidized Private pensions primarily serve economically advantaged households, with uptake patterns aligned to income, education, and occupational status. While existing studies show that the third pillar has increased funded pension wealth and will boost retirement incomes for many middle-class households (Börsch-Supan et al., 2012), participation remains highly uneven, with limited reach among those most in need of additional savings. By disaggregating participation across Riester, Basis, and Private pensions, we identify the socioeconomic and demographic drivers of engagement, providing a more complete picture of how Germany's third pillar operates in practice and how policy design affects its distributional impact.

3. Empirical Evaluation

We analyze five repeated cross-sections of German adults fielded annually from 2019 to 2023 by TELIS Finanz AG (N=500 per year). The survey uses stratified sampling across all federal states and records rich socioeconomic characteristics.[2] A key feature for our purposes is product-level granularity: for each respondent, the number of third-pillar contracts is reported separately for Riester, Basis, and unsubsidized Private pension. In the absence of official statistics linking third-pillar holdings to household characteristics (Pfarr and Schneider, 2013), this dataset provides rare micro-level coverage across all three product types. We treat the data as repeated cross-sections; standard errors are clustered at the postal-code level to allow arbitrary correlation within the same postal code. Our empirical strategy unfolds in two stages:

In the first stage, we examine the extensive margin by estimating the determinants of an individual's decision to participate in any third-pillar pension arrangement versus abstaining altogether. A standard binary choice logit model for participation in any third-pillar plan is estimated, including a restricted cubic spline in birth year with a four-knot specification in the manner of Royston and Sauerbrei (2007) to flexibly capture cohort effects, as well as survey year and federal state fixed effects to absorb absorb common time shocks and time-invariant regional heterogeneity.

In the second stage, we restrict the sample to those who have elected a third-pillar product and analyze the intensive margin namely, how participant characteristics and plan design features jointly govern the choice among Riester, Basis, and Private pensions. For this purpose, we fit a multinomial logit for pairwise choice among Private, Basis, and Riester products. This specification again includes year and regional fixed effects, clusters standard errors at the postal-code level and captures cohort effects with cubic splines in birth year. For robustness, we report estimates from the baseline specification and from variants that alter the fixed-effects structure and the set of interaction terms. We normalize the unsubsidized Private alternative as the base in the multinomial logit. This choice is warranted because unsubsidized contracts constitute the modal segment of the third pillar (70% of the stock; GDV 2025), making Private the natural counterfactual against which to evaluate fiscally incentivized designs. Anchoring on Private renders the results policy-salient: coefficients and AMEs read as reallocation of choice probabilities away from the unsubsidized market toward Riester or Basis. It also permits a transparent summary of subsidy incidence via the aggregated subsidized margin by pooling Riester and Basis, which isolates the subsidy-driven component of within-pillar selection, distinct from product-specific intensive-margin effects.

Robustness

A broad set of two-way interactions was systematically tested among the socioeconomic characteristics. Those that materially improved overall model fit as measured by likelihood-ratio tests and Pseudo R^2 gains were retained in the preferred specification. To preserve parsimony and focus the discussion on substantively meaningful margins, these interactions are omitted from the main tables being report in the Appendix. Their absence of clear marginal-effect heterogeneity suggests that, conditional on the rich set of controls, the key determinants of

[2] By design, the survey does not recontact prior respondents; unique respondent IDs do not recur across waves, confirming zero panel overlap. Consequently, there is no serial correlation at the individual level.

subsidized pension choice operate largely additively rather than through strong subgroup-specific offsets or amplifications.

To test for the multinomial logit required property of Independence of Irrelevant Alternatives (IIA) a suest-based Hausman specification test was conducted. All covariates yielded Prob > χ^2 > 0.05 for the coefficient-difference tests, thus it cannot be rejected that the relative utility parameters are unchanged when an alternative is dropped. This non-rejection confirms that the log-odds ratios between any pair of pension choices are stable, satisfy the IIA assumption, so that the multinomial logit is a valid framework for the intensive-margin analysis.

3.1 Extensive Margin – Participation Decision

Table 1 reports average marginal effects (AMEs) from four logit specifications that vary only in fixed-effect structure and pre-specified interactions. Column (4) augments the baseline with interactions between income quartiles and gender as well as income type and gender—motivated by evidence that gender gaps in financial behavior are larger at lower income levels (Lusardi and Mitchell, 2008; Bucher-Koenen et al., 2021) and. Column (3) replaces parsimonious codings with a saturated set of indicators for income source, vocational credential, educational degree, and parental status. Across columns, we report AMEs to express results as percentage-point changes in the probability of holding any third-pillar contract, holding other covariates and the included fixed effects constant.

Figure 1: Birth cohort effects on extensive margin

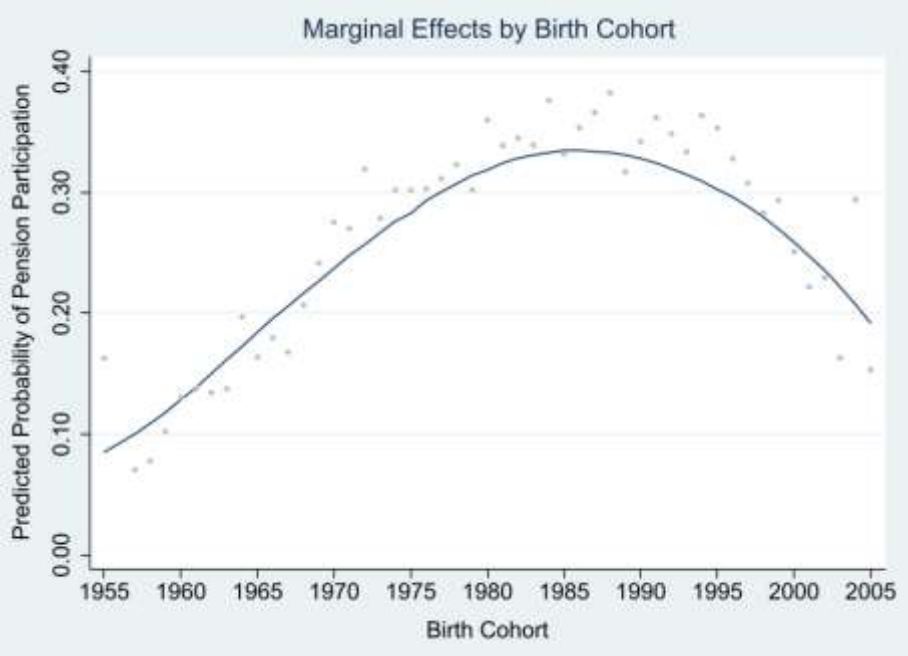


Figure 1 visually illustrates the average predicted probabilities of participation in third-pillar pension plans across different birth cohorts. Specifically, each dot corresponds to the mean predicted probability of holding at least one third-pillar pension contract calculated from logit regression model (4) for people born in a given year. Individuals born between 1955 and 2005 are represented, covering diverse generational groups from Baby Boomers to Millennials and Gen Z.

The overall shape indicates a non-linear relationship between birth cohorts and probability of third-pillar pension participation. For older cohorts till 1980 the participation rises steadily with every cohort, leading to a positive trend. Increased participation likelihood might reflect higher lifetime income stability, employment security, and awareness of upcoming demographic challenges due to the baby boomer. Generation Y has the highest predicted probability for participation in third-pillar pension with a starting transition to decreasing probability to Generation Z. Literature highlights these generations as facing greater financial insecurity, resulting in lower pension savings (Lusardi and Mitchell, 2014; Xie et al., 2023). The decline is contrary to the actual need of additional pension participation in the third pillar since the German Council of Experts states in their annual report 2023/2024 that the statutory pension scheme is threatened with a declining level of security with sharply rising contribution rates.

In Table 1 across specifications, income exhibits a strong, monotone and convex gradient in third-pillar participation. Relative to non-earners, the AMEs for the bottom two quartiles are small and statistically indistinguishable from zero, whereas Q3 and Q4 display large, precisely estimated premiums. In the preferred model (4), Q3 is associated with a 12.9 percentage point (p.p.) increase in the probability of holding any third-pillar contract, and Q4 with 21.9 p.p. higher participation probability. Substantively, below-median earners participate at rates similar to non-earners (unemployed, out of the labor force, parental leave), whereas above-median earners are much more likely to participate, consistent with prior evidence on the income sensitivity of voluntary retirement saving (Bucher-Koenen, 2011; Börsch-Supan et al., 2012).
Having any earned income is associated with a 12.4 p.p. higher probability of third-pillar participation relative to non-earners, holding covariates and fixed effects constant. Disaggregating by employment type, we find large and precisely estimated take-up premiums for civil servants 19.3 p.p. , sizeable effects for public-sector employees 16.3 p.p. and entrepreneurs/self-employed 15.6 p.p., and a positive association for regular employees 13.8 p.p.; students do not differ significantly from non-earners. These patterns are stable across specifications and align with Doerr and Schulte (2012). The gradients are consistent with institutional coverage and incentives: the self-employed, typically outside mandatory first-pillar insurance and with limited access to occupational (second pillar) plans, have greater need for third-pillar saving; civil servants, despite generous occupational pensions, may diversify or optimize tax timing. Overall, employment attachment and employment type are first-order predictors of third-pillar participation.

Completion of a vocational qualification is strongly associated with third-pillar participation, especially within Germany's dual system. Vocationally trained workers enter stable, formal employment earlier and are more exposed to intermediation and plan offerings; by contrast, individuals without such credentials face more fragmented employment and higher joblessness, limiting access and capacity to save (Eichhorst et al., 2013). Consistent with employment-linked eligibility rules, these institutional features map into sizable differences in uptake. In our preferred specification, the indicator for any vocational degree is associated with 10.7 p.p. higher participation. Disaggregated tracks are uniformly positive: the largest premiums arise for foremen/technical supervision (26.3 p.p.) and merchant qualifications (21.1 p.p.), with consistently positive effects for skilled trades, industrial occupations, specialists, and engineering. The magnitudes are stable across specifications, indicating that vocational credentials are a first-order predictor of entry into the third pillar.
Formal schooling is positively associated with third-pillar participation, but the gradient is concentrated at tertiary attainment. Relative to no qualification, lower-secondary, upper-secondary, and Master's degrees exhibit small, statistically indistinguishable AMEs once covariates and fixed effects are held constant. By contrast, tertiary professional and academic credentials display large, precisely estimated effects: a Bachelor's degree is associated with 13.8

p.p., the Staatsexamen (licensure for regulated professions such as law, medicine, pharmacy) with 17.7 p.p. increase in participation probability. These patterns are consistent with differences in lifetime earnings capacity and financial capability; prior work links formal professional training to superior retirement planning and participation in long-horizon saving (Lusardi and Mitchell, 2014).

Regressions (1)-(4) shows a highly significant gender participation gap. Women are more likely to have a additional pension contract which helps to close the existing gender pension gap (Hänisch and Klos, 2014; Niessen-Ruenzi and Schneider, 2022). Female respondents are consistently 5.9 p.p. more likely to participate in third-pillar pension plans. The effect is highly robust to inclusion of cohort splines, fixed effects, and interaction terms, indicating that even after controlling for income, occupation, education, family structure, and regional-year shocks, women exhibit materially higher take-up rates. This result is in line with Lambregts and Schut (2020) who find that women are more likely to opt for annuities then men.
Divorced respondents are significantly less likely to participate in the third pillar than never-married individuals by -12.3 percentage points. A plausible mechanism is that marital dissolution triggers liquidity shocks, credit constraints, and administrative plus transaction costs associated with dividing retirement assets, alongside heightened income and household-structure volatility, each of which can suppress long-horizon saving. An offsetting channel exists via Germany's pension equalization laws, which reallocate accrued rights at divorce and can raise public pension entitlements for one partner (Kreyenfeld et al., 2023); nevertheless, in our data the net association remains negative.
The indicator for having children is positively and significantly associated with third-pillar participation by 5.7 p.p., whereas the count of children is not. This pattern is consistent with a precautionary entry effect: the onset of parental responsibility triggers adoption of at least one contract, but additional children do not further raise participation once fixed entry costs and tighter household budgets bind. Interpreted within a life-cycle framework, the first child shifts perceived income and longevity risks enough to cross the participation threshold; marginal increases in family size do not, likely due to saturation and liquidity constraints.

3.2 Intensive Margin – Product Choice Decision

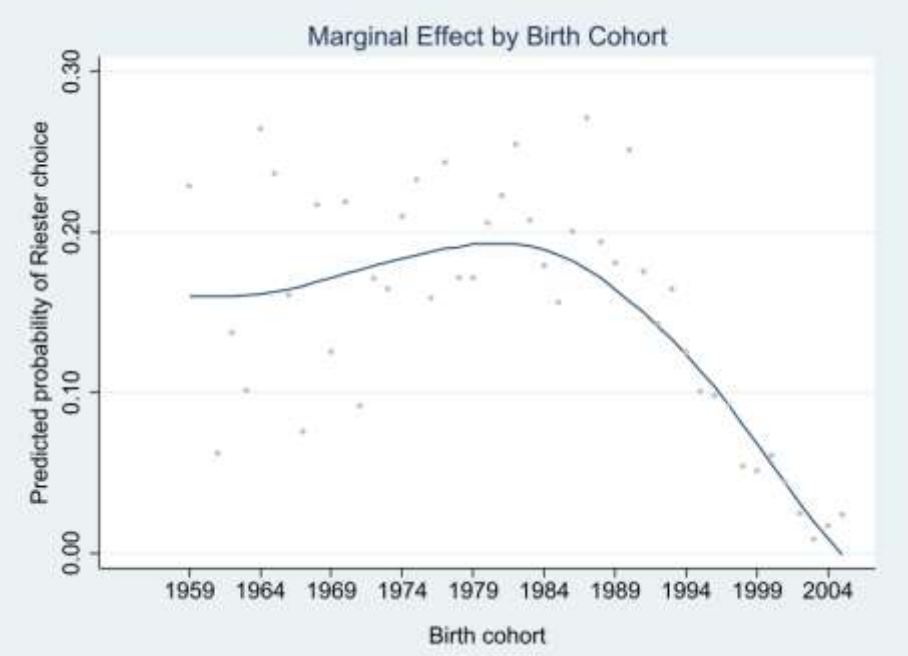
Conditional on participation, product selection among Private, Riester, and Basis is modeled with a multinomial logit that normalizes Private as the reference alternative. We report AMEs interpreted as percentage-point changes in the probability of selecting each product associated with a one-unit change in a covariate, holding other regressors fixed and averaging over the sample. We have included interactions between relationship and income, gender and children as well as education and income for which the results are visualized in the Appendix. To summarize the role of fiscal incentives, we also report an aggregated subsidized intensive margin, the combined probability of choosing a subsidized product rather than the unsubsidized alternative, which provides a single measure of reallocation toward subsidized contracts and is unaffected by the choice of base category. In Table 2 Columns (1)-(3) present results for the Riester choice, columns (4)-(6) for the Basis choice, and columns (1)-(3) in Table 3 for the aggregated subsidized margin. Our interpretation is grounded in specifications that include interaction terms and fixed effects

Pairwise Intensive Margin - Riester

Figure 2 plots, by birth year, the mean predicted probability of selecting a Riester contract. Cohorts up to roughly 1987 display markedly higher Riester choice than Private, about 15-20 percentage points on average. Whereas the probability falls steeply for later cohorts, approaching zero for those born around 2004. This pattern is consistent with prior evidence of strong early

uptake followed by stagnation (Pfarr and Schneider, 2011; Börsch-Supan et al., 2012; Geyer et al., 2021). A plausible mechanism is the tightening guarantee environment and rising effective costs over the sample period. Since the introduction of Riester in 2002, the statutory maximum technical interest rate (Höchstrechnungszins) declined from 3.25% to 0.25% by 2024, tightening capital-preservation constraints and pushing portfolios toward lower-risk assets (Brandt et al. 2024). Average expense ratios near 12% further compress expected net returns (Gasche et al., 2013). This environment supports the cohort gradient we observe. Later entrants face less favorable risk-return conditions.

Figure 2: Birth cohort effects on intensive margin (Riester)



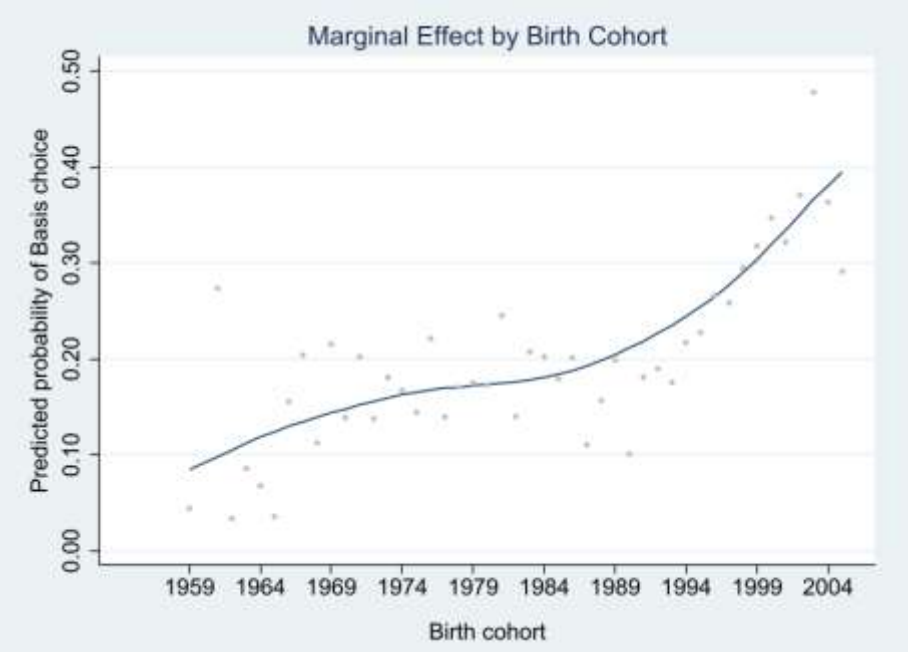
Alternative-specific AMEs effects in Table 1 indicate a pronounced income pattern. Above-median earners are 15.8 p.p. less likely to choose a Riester contract, consistent with the program's design under which net subsidies and thus after-tax returns are more favorable at lower incomes. This aligns with evidence of declining Riester take-up at the top of the income distribution and a more equal income profile for Riester than for Private products (Pfarr and Schneider, 2013; Börsch-Supan et al., 2012). Entrepreneurs are 12.6 p.p. less likely to select Riester, a pattern consistent with the greater liquidity for Basis and flexibility of Private during accumulation. For other income-type categories, differences are small and statistically indistinguishable from zero.

Education gradients do not carry over to Riester choice once participation is conditioned on. Neither tertiary schooling nor vocational credentials significantly predict selecting Riester over a Private contract. A plausible interpretation is that the uniform, salient subsidy schedule attenuates education-related differences in product selection. Gender differences are also negligible; in contrast to early-period evidence of a small female shortfall (Börsch-Supan et al., 2008), our estimates suggest no substantive gender gap in the Riester-Private margin over the more recent period.

Partnered respondents are 11.4 p.p. more likely to select a Riester contract, a sizeable and statistically significant association consistent with prior evidence (Pfarr and Schneider, 2011). A plausible channel is household pooling and risk sharing, potentially reinforced by spousal eligibility and allowance rules, which raise the salience of the subsidized option. By contrast, the children indicator is small, negative, and statistically indistinguishable from zero once relationship

status is included. Suggesting that child-related expenditures do not systematically tilt product choice away from Private despite Riester's child allowances. This pattern aligns with Kuper and Schmidt (2016), who document that price incentives, rather than family composition per se, are the primary drivers of Riester selection.

Figure 3: Birth cohort effects on intensive margin (Basis)



Pairwise Intensive Margin - Basis

Comparing Figure 2 (Riester) and Figure 3 (Basis) reveals divergent cohort profiles after 1987: while the predicted probability of choosing Riester declines sharply for younger birth cohorts, the probability of choosing Basis rises from roughly 20 to about 38 percentage points relative to Private. This pattern of reallocation is consistent with substitution away from Riester and toward Basis among later cohorts. Contemporary market data point in the same direction. According to GDV (2025), new Basis policies increased from 77,000 (2018) to 132,000 (2024) and the in-force stock from 2.25 million to 2.82 million, whereas Riester new business fell from 300,000 (2018) to 30,000 (2024) with an 8.8% decline in the portfolio, mirroring the cohort-level shift observed in our estimates.

Because Basis contributions are deductible at the marginal income tax rate, higher earners receive larger immediate tax relief. Consistent with this design, individuals in the top half of the income distribution are about 14.9 p.p. more likely to select Basis rather than an unsubsidized Private plan. This pattern accords with administrative evidence. Claimants of Basis deductions are concentrated among the top quintile of taxpayers (Kuper, 2017).
Relative to the no-income-stream baseline, who cannot benefit from tax-deductibility, product choice varies sharply by income type. Self-employed respectively entrepreneurs are about 71.9 p.p. more likely to select a Basis contract over a non-subsidized Private contract. We obtain smaller effects for employees with 18.5 p.p. and civil servants with 15.4 p.p. increase in participation probability. These differences are in line with institutional incentives: the self-employed lack employer-sponsored or mandatory PAYG coverage and can deduct contributions at their marginal tax rate, whereas employees and civil servants already accumulate retirement

wealth in statutory and possibly occupational schemes, attenuating the incremental value of an additional tax-sheltered annuity (Holzmann and Hinz, 2005).

Conditional on participation a vocational qualification is not associated with a differential likelihood of selecting Basis rather than a Private plan; the vocational-degree indicator is close to zero and statistically insignificant. By contrast, tertiary education is strongly predictive: graduates exhibit a 16.5 p.p. higher probability of choosing Basis over Private. This gradient is consistent with the documented link between higher formal schooling, financial literacy, and the capacity to utilize complex tax-advantaged retirement vehicles (Lusardi and Mitchell, 2014).

Gender and partnership show little role in this margin. The average marginal effect for women is near zero, implying no substantive gender disparity once selection into the third pillar is accounted for. Conditional on participation, this aligns with evidence that gender gaps in defined-contribution saving attenuate among self-selected participants (Choi et al., 2002). Likewise, partnership does not significantly shift the Basis-Private choice, in line with the product's lack of relationship-specific incentives.

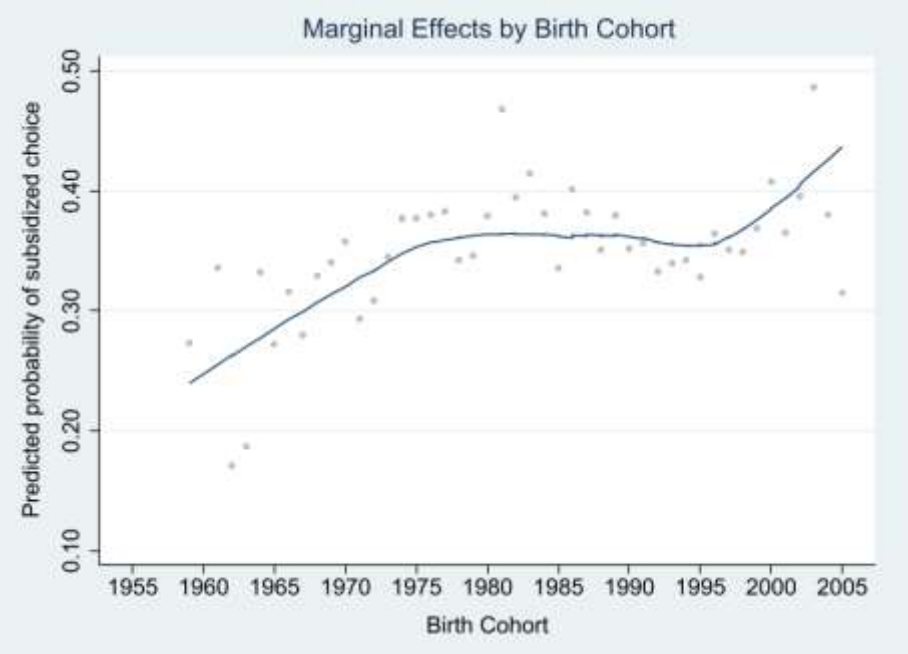
By contrast, children are associated with a modest negative effect. Households with children are about 6.3 p.p. less likely to choose Basis relative to Private. This pattern accords with life-cycle considerations. Higher contemporaneous expenditures and liquidity needs during child-rearing make the illiquidity of Basis less attractive, while the greater flexibility of Private contracts lowers the opportunity cost of participation (Attanasio and Weber, 2010).

Subsidized Intensive Margin

We report AMEs for the combined probability of choosing a subsidized contract, defined as selecting either Riester or Basis conditional on third-pillar participation. Collapsing the two subsidized options into a single outcome yields a policy-relevant summary measure of how covariates are associated with reallocation toward subsidized products, abstracting from product-specific idiosyncrasies. This aggregated margin permits a direct assessment of the extent to which subsidies, in the aggregate, draw participants away from unsubsidized Private plans. It also facilitates comparability with the extensive margin of any participation, allowing a unified decomposition into entry versus within-pillar product choice.

Figure 4 plots the combined predicted probability of selecting a subsidized by birth year. The cohort profile is markedly non-monotonic: cohorts born before 1970 average at a higher participation probability at roughly 20-30 p.p., those born in the 1970s early 1980s cluster around 35-40 p.p., and post-1995 cohorts rise again in subsidized pension up-take, exceeding 45 p.p. for the youngest observed. The shape indicates that the propensity to choose a subsidized product, conditional on third-pillar participation, rose for mid-cohorts, dipped, and then strengthened again among the youngest adults. A plausible economic interpretation links this pattern to the prolonged low-interest-rate environment and evolving guarantee technology. As market rates fell over the past two decades, pre-tax yields on unsubsidized private contracts were compressed, while state top-ups (Riester) and front-loaded deductibility (Basis) became comparatively more salient in boosting net returns. The advantage is especially pronounced for younger cohorts, who possess a longer remaining saving horizon over which these fiscal benefits can compound. This mechanism is consistent with evidence that third-pillar subsidies have supported funded savings, particularly for middle-class households (Börsch-Supan et al., 2012), and with cohort differences in program engagement documented for Germany (Pfarr and Schneider, 2013).

Figure 4: Birth cohort effects on subsidized intensive margin



On the aggregated subsidized margin, income effects are small and generally statistically insignificant once we condition on participation. This pattern is consistent with offsetting product-specific associations: higher income is linked to a lower probability of selecting Riester but a higher probability of selecting Basis; when pooled, these effects largely net out. We therefore do not interpret the aggregate null as evidence that the subsidy design levels returns across the income distribution—Basis relief scales with the marginal tax rate and is intrinsically more valuable at higher incomes (Börsch-Supan and Wilke, 2004; Pfarr and Schneider, 2013). Instead, conditional on entry, residual variation in the choice between subsidized and unsubsidized options appears less income-sensitive and more influenced by non-pecuniary frictions, like plan complexity, inertia, and advice quality (Benartzi and Thaler, 2007).

Salaried employees are 11.5 p.p. more likely to choose a subsidized contract than an unsubsidized Private plan. For public-sector workers, estimates are imprecise and do not meet conventional significance thresholds, consistent with relatively generous statutory or occupational coverage (Börsch-Supan and Wilke, 2004). By contrast, self-employed individuals and entrepreneurs exhibit a large and precisely estimated 59.3 p.p. shift toward subsidized products. The ordering of effects places the self-employed at the top, followed by employees, with civil servants smallest and statistically weakest. This pattern accords with institutional incentives: Basis deductions are most valuable to those without access to occupational schemes and increase with taxable income, whereas existing pension coverage for employees and civil servants reduces the incremental value of third-pillar subsidies (Sinn, 2000; Holzmann and Hinz, 2005).

A vocational qualification is not associated with a differential likelihood of choosing a subsidized product; the estimated effect is close to zero and statistically indistinguishable from zero. By contrast, tertiary education is associated with an increase of about 13.5 p.p. in the probability of selecting a subsidized arrangement, consistent with evidence that higher formal schooling facilitates the use of tax-advantaged saving instruments (Lusardi and Mitchell 2014). Partnership is linked to a 7.8 p.p. higher probability of choosing a subsidized contract, whereas having children is associated with a 8.6 p.p.lower probability, plausibly reflecting tighter liquidity and near-term consumption needs that tilt households toward more flexible Private products. We find no statistically significant gender difference on the aggregated subsidized margin once education,

household status, and income are held constant. Men and women participate in the subsidized intensive margin at similar rates perhaps reflecting that eligibility rules and subsidy structures are gender-neutral in design.

4. Conclusion

This paper brings new evidence to Germany's third-pillar pension by separating market entry from within-pillar product choice and by introducing an aggregated subsidized margin that summarizes selection into Riester or Basis versus Private contracts. Using recent nationally representative microdata from German adults with unique product-level granularity linking third-pillar contracts to household characteristics on two-stages the extensive, intensive and subsidized intensive margin get analyzed.

At the extensive margin, participation is shaped foremost by labor-market attachment and the income distribution. Households with stable earnings and strong ties to formal employment are far more likely to hold any third-pillar contract, whereas low and irregular earners, precisely those for whom additional saving would matter most, remain underrepresented. Notably, participation in the third pillar is disproportionately higher for women than for men.
At the intensive margin, conditional on entry, choices align closely with institutional design. Higher incomes tilt selections away from the allowance-based contract and toward the tax-deductible alternative, and the self-employed lacking occupational coverage display a marked preference for the tax-advantaged design. By contrast, education gradients that are visible at the entry stage largely attenuate once households are inside the pillar, and gender differences are negligible in product choice. Furthermore among younger cohorts, Riester participation weakens as Basis becomes more prevalent.
For the subsidized intensive margin, pooling Riester and Basis reveals that income effects largely wash out, consistent with progressive allowances at lower incomes offsetting deductibility at higher incomes. Yet the nature of earnings remains decisive, with the self-employed much more likely to select a subsidized arrangement than employees or civil servants. Cohort profiles of the aggregated subsidized probability strengthen among the youngest cohorts, a pattern consistent with the low interest rate environment having compressed the relative appeal of Private products and lengthened the horizon over which subsidies compound.

The results points to a reorientation need of third-pillar policy from product engineering to entry, because participation and not within-pillar reallocation is the margin on which the system binds. Design should be explicitly targeted to underrepresented households by cutting fixed and cognitive enrollment costs and by adopting income-contingent contribution rules with refundable support that keep saving feasible when earnings are low or volatile. Taken together, this shift expands coverage where it is most needed, preserves neutrality across products, and limits unintended substitution - leaving a simpler, more effective third-pillar architecture.

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Appendix

Table 1: Extensive Margin of Third-Pillar Participation

	(1)	(2)	(3)	(4)
Age				
Cohort Spline 1	.0123***	.0126***	.0107***	.0132***
	(.003)	(.003)	(.003)	(.003)
Cohort Spline 2	-.0157***	-.0161***	-.0115**	-.0170***
	(.006)	(.006)	(.006)	(.006)
Cohort Spline 3	.0715	.0805*	.0350	.0857*
	(.046)	(.046)	(.043)	(.046)
Income				
Q1	.0535	.0545	.0431	.0421
	(.056)	(.059)	(.045)	(.056)
Q2	.0360	.0335	.0310	.0244
	(.039)	(.039)	(.027)	(.040)
Q3	.1364***	.1374***	.1388***	.1290***
	(.044)	(.043)	(.032)	(.044)
Q4	.2233***	.2362***	.2434***	.2187***
	(.046)	(.046)	(.032)	(.048)
Income Type			.1240***	
			(.030)	
Employee	.0945*	.0933*		.1380***
	(.046)	(.048)		(.052)
Student	.0268	.0296		.0601
	(.066)	(.067)		(.067)
Civil Servant	.1518**	.1415**		.1933***
	(.072)	(.071)		(.073)
Public Service	.1093*	.1020*		.1633**
	(.062)	(.061)		(.066)
Entrepreneur	.1021*	.1014*		.1563**
	(.055)	(.055)		(.062)
Vocational Degree (No/Yes)			.1071***	
			(.025)	
Other	.1454***	.1600***		.1602***
	(.033)	(.032)		(.032)

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	(1)	(2)	(3)	(4)
Specialist	.1165*	.1353**		.1415**
	(.068)	(.068)		(.069)
Crafts	.1379***	.1521***		.1511***
	(.037)	(.037)		(.036)
Industry	.1001**	.1157**		.1126**
	(.050)	(.049)		(.049)
Merchant	.1993***	.2100***		.2112***
	(.035)	(.034)		(.034)
Engeneering	.1822**	.1773**		.1783**
	(.095)	(.090)		(.092)
Foreman	.2593***	.2681***		.2627***
	(.067)	(.066)		(.066)
Educational Degree (No/Yes)			.0413	
			(.030)	
Secondary School	.0800	.0644		.0581
	(.052)	(.052)		(.053)
High School	.0628	.0486		.0421
	(.053)	(.053)		(.054)
Bachelor Degree	.1593***	.1441**		.1375**
	(.056)	(.057)		(.057)
Diploma	.1051	.0790		.0702
	(.068)	(.068)		(.068)
Master Degree	.1019	.0809		.0807
	(.063)	(.064)		(.064)
PhD	.3096*	.2886		.2796
	(.179)	(.182)		(.185)
State Examination	.1940***	.1789**		.1769**
	(.086)	(.085)		(.085)
Female	.0538**	.0598***	.0630***	.0594***
	(.021)	(.021)	(.019)	(.021)
Marital Status				
Married	-.0398	-.0295	-.0335	-.0289
	(.028)	(.028)	(.026)	(.028)
Divorced	-.1381***	-.1234**	-.1237***	-.1225**
	(.048)	(.049)	(.047)	(.049)

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	(1)	(2)	(3)	(4)
Domestic Partnership	-.0522 (.034)	-.0603* (.033)	-.0507 (.031)	-.0583* (.033)
Seperated	-.0903 (.104)	-.0810 (.102)	-.0947 (.092)	-.0808 (.103)
Widdowed	-.1788 (.142)	-.1706 (.139)	-.1864 (.130)	-.1541 (.149)
Children (No/Yes)			.0572** (.022)	
Children = 1	.0362 (.028)	.0424 (.028)		.0410 (.028)
Children = 2	.0542* (.032)	.0545* (.032)		.0511 (.032)
Children = 3	.0561 (.046)	.0562 (.044)		.0520 (.044)
Children = 4	.0158 (.082)	.0395 (.089)		.0335 (.087)
Children = 5	−.0345 (.130)	−.0360 (.136)		−.0382 (.138)
Year FE	✗	✓	✓	✓
Federal State FE	✗	✓	✓	✓
Interactions	✗	✗	✗	✓
N	2293	2293	2500	2293
Pseudo-R^2	0.092	0.109	0.097	0.113
AUC	0.702	0.721	0.709	0.724
Hosmer Lemeshow Test	0.034	0.291	0.679	0.352

(i) ***, **, * denote significance at the 1%, 5% and 10% levels.

(ii) Coefficient estimates are rounded to four decimals, and standard errors (in parentheses) are rounded to three decimal places.

(iii) This holds for all reported tables.

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Table 2: Pairwise Intensive Margin with Private as Baseoutcome

	Riester			Basis		
	(1)	(2)	(3)	(4)	(5)	(6)
Age						
Cohort Spline 1	.0027 (.005)	.0032 (.005)	.0062 (.005)	.0140** (.007)	.0148** (.006)	.0149** (.007)
Cohort Spline 2	-.0011 (.008)	-.0015 (.008)	-.0071 (.008)	-.0221** (.010)	-.0234** (.010)	-.0229** (.012)
Cohort Spline 3	-.0651 (.071)	-.0510 (.074)	-.0049 (.072)	.1814** (.077)	.1856** (.074)	.1788** (.075)
Income						
Below Average	-.0759 (.099)	-.0744 (.085)	-.0728 (.090)	.0690 (.051)	.0642 (.057)	.0648 (.057)
Above Average	-.1724* (.098)	-.1623* (.083)	-.1581* (.087)	.1665*** (.046)	.1530*** (.051)	.1490*** (.051)
Income Type						
Employee	-.0662 (.096)	-.0445 (.083)	-.0339 (.080)	.1851*** (.019)	.1851*** (.015)	.1848*** (.016)
Public Service	-.0528 (.103)	-.0255 (.095)	.0052 (.096)	.1508*** (.042)	.1544*** (.040)	.1542*** (.040)
Entrepreneur	-.1774** (.085)	-.1520** (.077)	-.1258* (.072)	.7687*** (.118)	.7427*** (.129)	.7190*** (.129)
Vocational Degree (No/Yes)	-.0259 (.052)	.0025 (.045)	.0019 (.044)	-.0454 (.062)	-.0703 (.063)	-.0714 (.063)
Educational Degree (No/Yes)	.0082 (.055)	.0143 (.051)	-.0300 (.060)	.1321*** (.040)	.1292*** (.040)	.1650*** (.027)
Female	.0124 (.030)	.0103 (.029)	.0067 (.029)	.0054 (.032)	-.0014 (.031)	-.0014 (.031)
In Relationship (No/Yes)	.1079*** (.031)	.1080*** (0.30)	.1137*** (.030)	-.0434 (.041)	-.0363 (.040)	-.0356 (.039)
Children (No/Yes)	-.0242 (.031)	-.0208 (.034)	-.0230 (.030)	-.0617* (.037)	-.0613* (.036)	-.0625* (.036)
Year FE	✗	✓	✓	✗	✓	✓
Federal State FE	✗	✓	✓	✗	✓	✓
Interactions	✗	✗	✓	✗	✗	✓
N	685	685	685	685	685	685
Pseudo-R^2	0.088	0.116	0.135	0.088	0.116	0.135
Wald χ^2	4596.2	4299.8	7823.2	4596.2	4299.8	7823.2

Table 3: Subsidized Intensive Margin with Private as Baseoutcome

	Subsidized		
	(1)	(2)	(3)
Age			
Cohort Spline 1	.0167**	.0180**	.0211***
	(.008)	(.007)	(0.08)
Cohort Spline 2	-.0232**	-.0249**	-.0300**
	(.012)	(.012)	(.012)
Cohort Spline 3	.1163	.1326	.1739*
	(.095)	(.095)	(.095)
Income			
Below Average	-.0065	-.0102	.0080
	(.110)	(.100)	(.106)
Above Average	-.0059	-.0093	-.0092
	(.107)	(.095)	(.101)
Income Type			
Employee	.1189	.1406*	.1151*
	(.097)	(.084)	(.081)
Public Service	.0981	.1289	.1490
	(.109)	(.100)	(.101)
Entrepreneur	.5913***	.5907***	.5932***
	(.122)	(.126)	(.122)
Vocational Degree (No/Yes)	-.0713	-.0678	-.0695
	(.069)	(.069)	(.069)
Educational Degree (No/Yes)	.1403**	.1435**	.1350**
	(.064)	(.062)	(.065)
Female	.0178	.0089	.0053
	(.040)	(.039)	(.039)
In Relationship (No/Yes)	.0644	.0716	.0781*
	(.045)	(.044)	(.045)
Children (No/Yes)	-.0859*	-.0820*	-.0855*
	(.047)	(.046)	(.046)
Year FE	✗	✓	✓
Federal State FE	✗	✓	✓
Interactions	✗	✗	✓
N	685	685	685
Pseudo-R^2	0.088	0.116	0.135
Wald χ^2	4596.2	4299.8	7823.2

Figure 5: Interaction of Gender and Income (Extensive Margin)

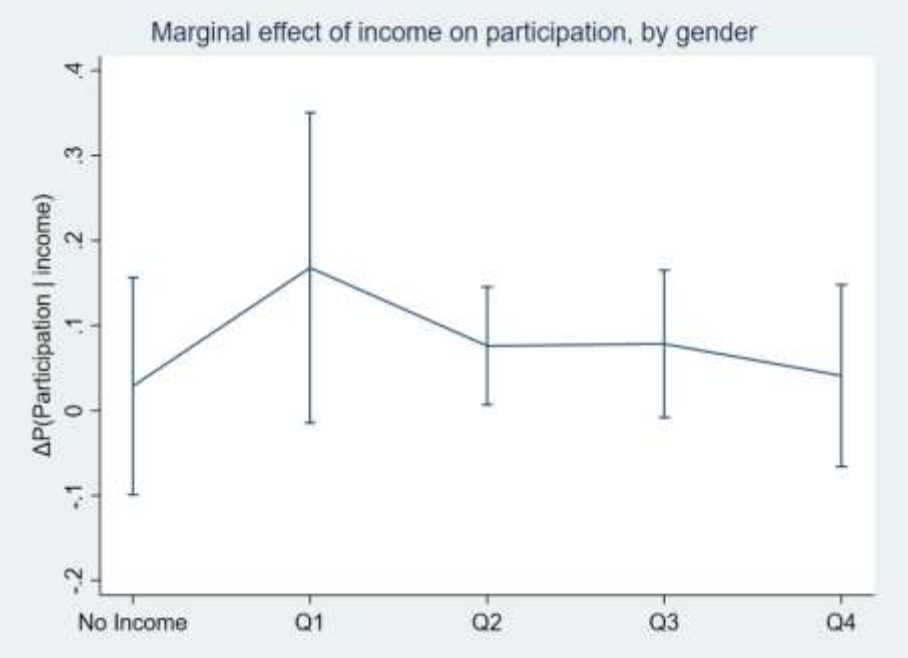

Figure 6: Interaction of Gender and Income-Type (Extensive Margin)

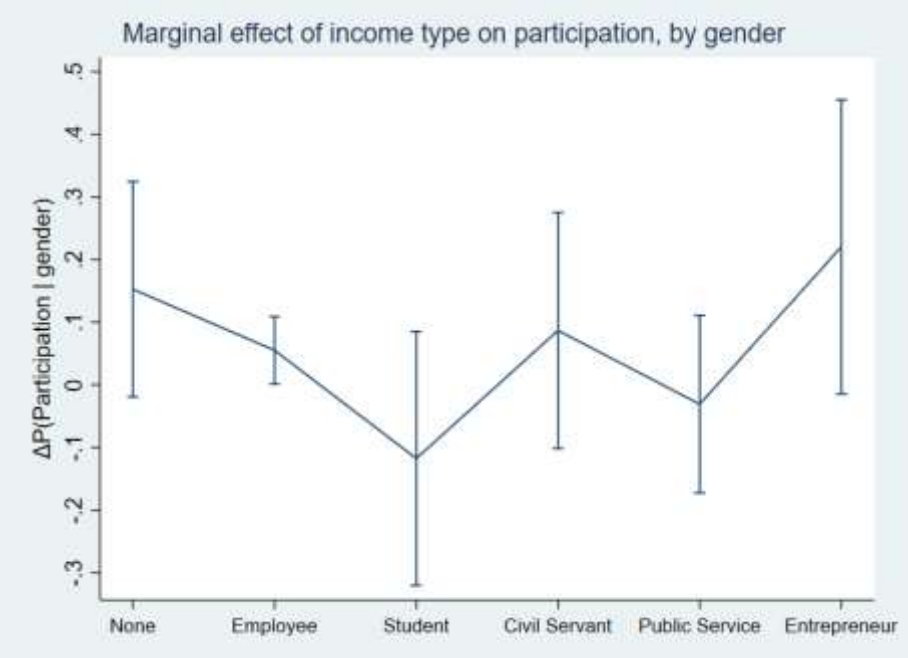

Figure 7: Interaction of Tertiary Education and Income
(Intensive and Subsidized Intensive Margin)

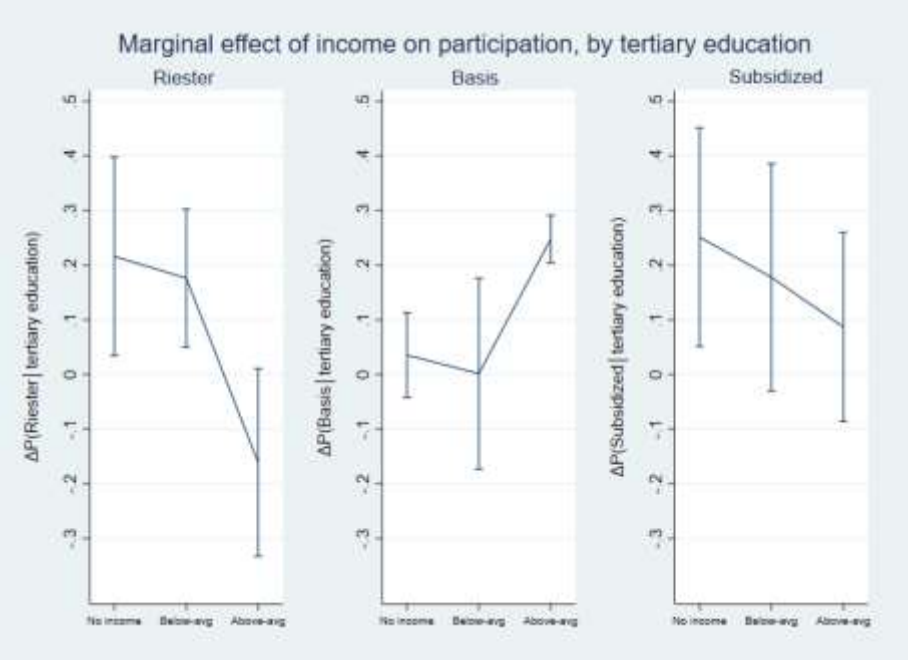

Figure 8: Interaction of Gender and Children (Intensive and Subsidized Intensive Margin)

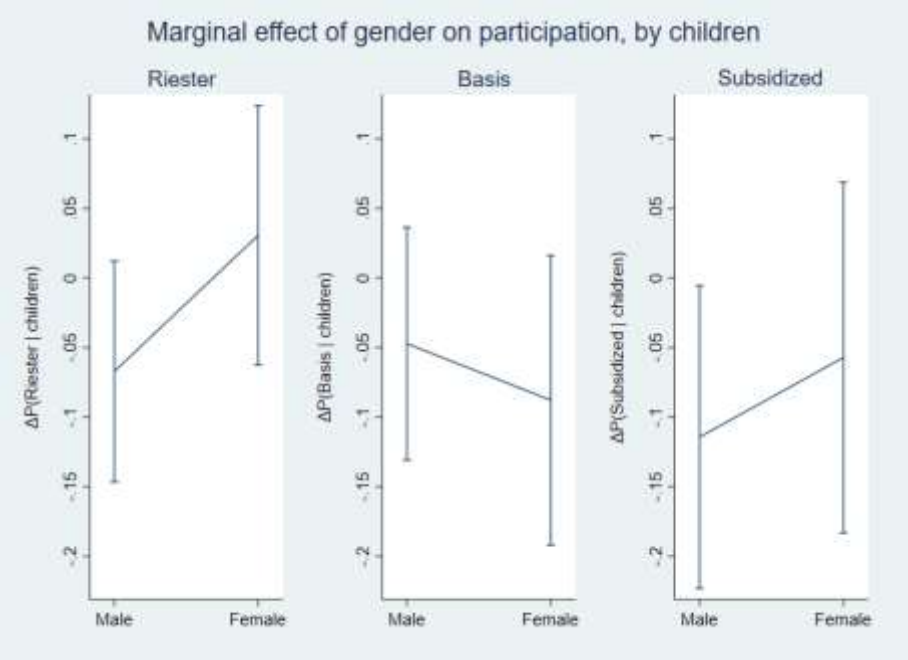

Figure 8: Interaction of Relationship and Income (Intensive and Subsidized Intensive Margin)