

# Behavioral Responses to a Pension Savings Mandate: Quasi-experimental Evidence from Swiss Tax Data

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# Motivation

- To tackle the “retirement savings crisis” (Benartzi & Thaler, 2013), policymakers look for strategies to improve individuals’ financial preparedness
- Straightforward instrument is a **pension savings mandate**
  - requiring workers by law to contribute some fraction of their earnings to a pension account that they can only access upon entering retirement
- Overall effect on savings depends on individual savings behavior:
  1. For passive savers, contributions directly add to total savings
  2. For active savers, contributions may crowd out other types of savings
  3. If there is an initial lack of salience or information, mandate might crowd in additional pension savings

# This paper

## **Research question:**

- What is the effect of a pension savings mandate on other forms of pension savings, private savings, and total savings?

## **Exceptional data & setting in Switzerland:**

- Rich administrative tax data on income, wealth, and savings
- Swiss occupational pension system provides compelling identifying variation

## **Quasi-experimental research designs:**

- Regression discontinuity design using mandate cutoff
- Difference-in-differences design exploiting 2005 reform lowering threshold

## Preview of main results

1. Occupational pension savings mandate increases voluntary retirement savings
2. Crowding-in effect is driven by information and salience effects
3. Increase in retirement savings appears to be funded by reduced private savings rather than lower current consumption, leaving total savings unaffected

# Institutional background

Swiss old-age provision system consists of three pillars:

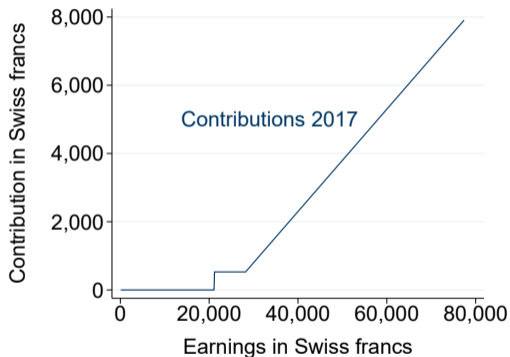
1. Compulsory PAYG system
2. Fully funded occupational pension system
3. Voluntary private pension savings with contribution cap

Occupational pension system is key instrument for retirement planning:

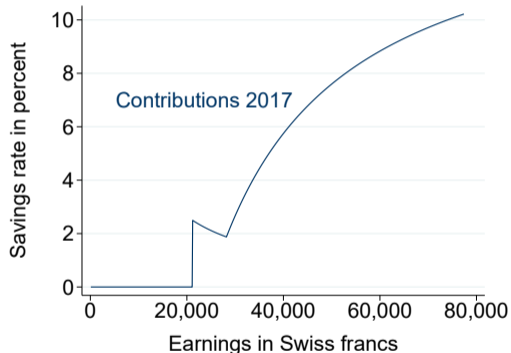
- Employees with earnings above threshold must contribute under mandate
- 4.2m individuals ( $\approx$  83% of labor force) enrolled in occupational pension funds
- Total contributions: 8% of Swiss GDP
- Wealth in occupational pension funds: 129% of Swiss GDP

# Mandated occupational pension contributions

(A) Contribution levels in Swiss francs



(B) Savings rates



# Data

- Administrative tax data on income, wealth, savings, and basic demographics of entire population in the canton of Bern in 2002–2017 [▶ Summary statistics](#)
- Savings measures:
  - Occupational pension savings: imputed by applying contribution schedule to earnings
  - Private pension savings: directly observed in tax data
  - Occupational pension buy-ins: directly observed in tax data
  - Private savings: change in net wealth relative to previous year

# Regression discontinuity approach

## Identification:

- Exploit discontinuity in mandate coverage at earnings threshold
- Average PO need to be continuous across threshold ▶ Validity tests

## Estimation:

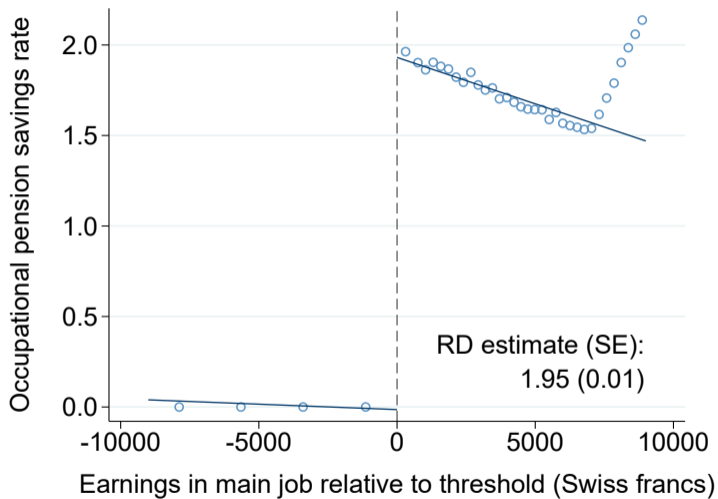
- Local linear regression:

$$Y_i = \beta_0 + \beta_1 \times \mathbb{1}\{X_i \geq c\} + \beta_2(X_i - c) + \beta_3(X_i - c) \times \mathbb{1}\{X_i \geq c\} + Z_i' \gamma + \epsilon_i$$

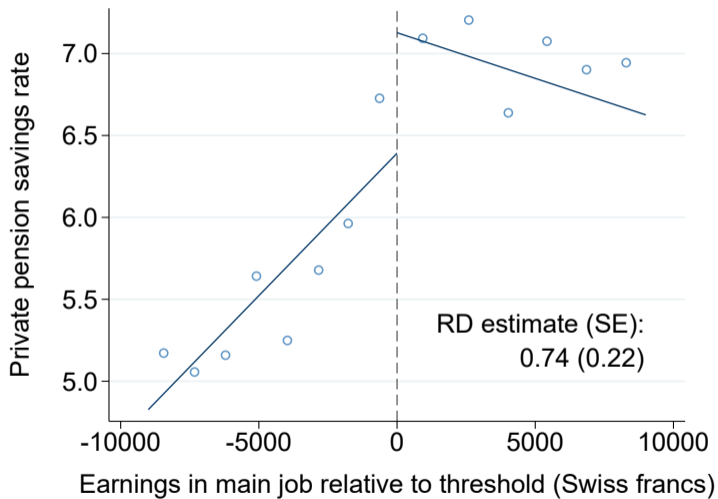
- $Y_i$ : savings rate of interest for individual  $i$
- $X_i$ : earnings in the main job (running variable)
- MSE-minimizing bandwidth (Calonico et al., 2014)
- Triangular kernel



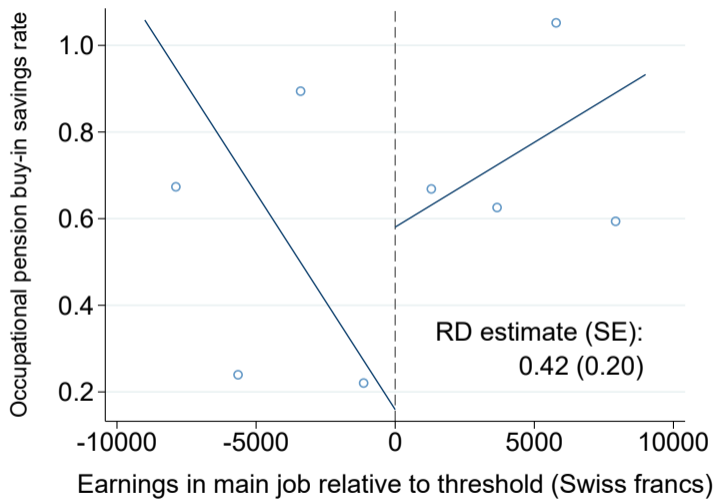
# Mechanical effect on occupational pension savings



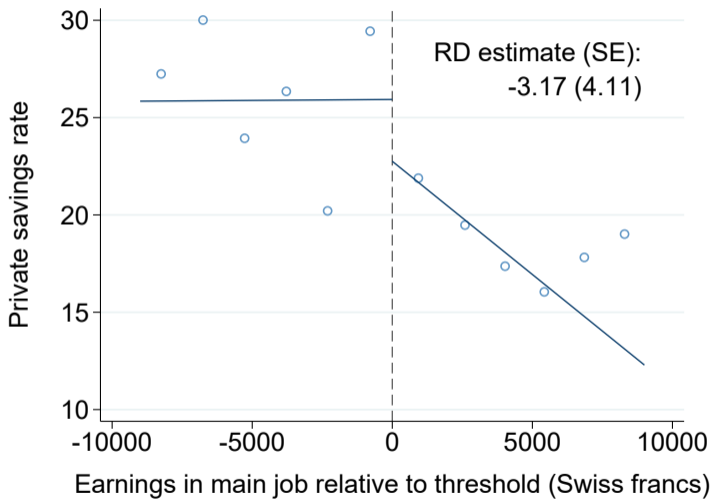
## Effect on private pension savings



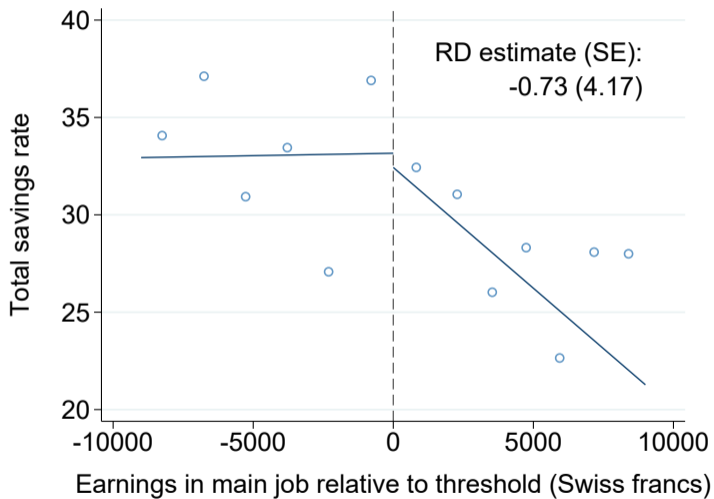
## Effect on occupational pension buy-ins



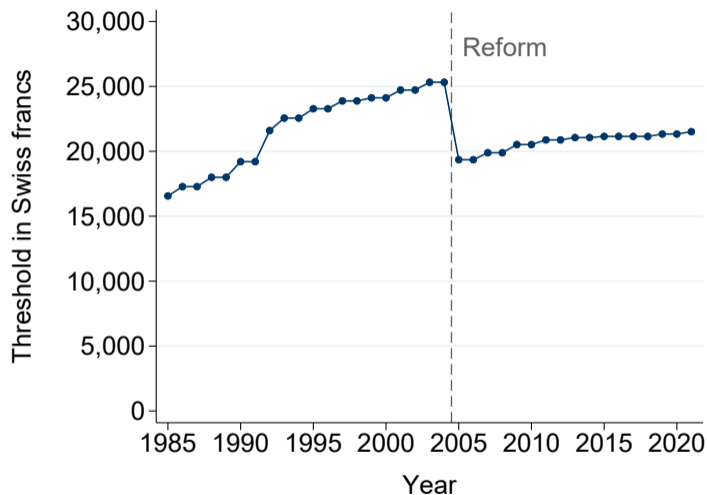
## Effect on private savings



## Effect on total savings



# Reform extending coverage of pension savings mandate in 2005



# Difference-in-differences approach

## Identification:

- Reform provides exogenous variation in mandate coverage ▶ Treatment assignment
- Construct treatment and comparison group based on pre-reform earnings:

$$T_i = \begin{cases} 1 & \text{if } \text{earnings}_{i,2004} \in [C_{2005}, C_{2004}) \\ 0 & \text{if } \text{earnings}_{i,2004} < C_{2005} \end{cases} \quad \text{▶ Summary statistics}$$

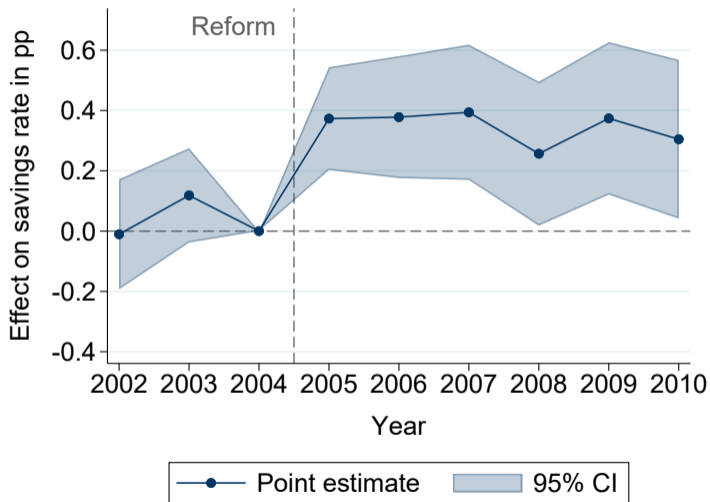
- Parallel trends assumption must hold

## Estimation:

- Dynamic difference-in-differences specification:

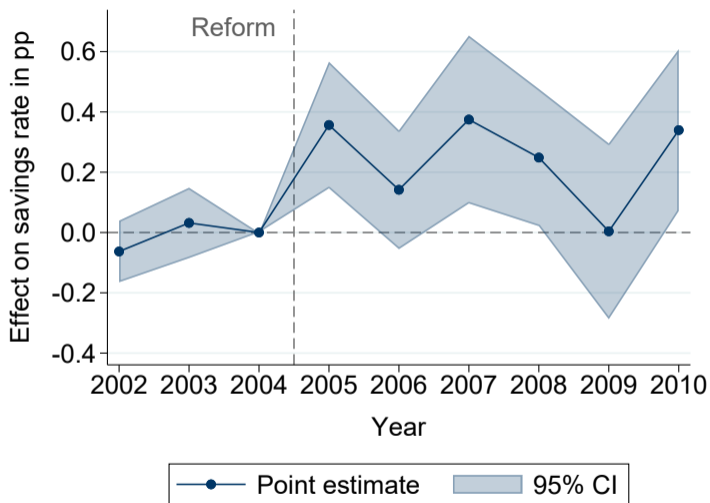
$$Y_{it} = \sum_{\substack{k=2002 \\ k \neq 2004}}^{2010} \beta_k \times \mathbb{1}\{t = k\} \times T_i + \mu_i + \lambda_t + \varepsilon_{it}$$

# Dynamic effect on private pension savings





## Dynamic effect on occupational pension buy-ins



## Evidence of information and salience effects driving crowding-in

	Private pension savings	
	(1)	(2)
Static DD	0.31*** (0.088)	
Static DD $\times$ no priv. pens. savings pre-reform		0.64*** (0.091)
Static DD $\times$ positive priv. pens. savings pre-reform		-0.46*** (0.15)
Observations	157,392	157,392

## Main takeaways

- Occupational pension savings mandate **crowds in** voluntary savings for retirement
    - 1pp increase in occupational pension savings rate raises **private pension savings rate** by 0.3–0.4pp
    - 1pp increase in occupational pension savings rate raises **occupational pension buy-ins** by 0.2–0.3pp
  - Information and salience effects matter a lot for retirement planning (in line with e. g. Dolls et al., 2018)
- ⇒ Mandate is effective in boosting **pension** savings (mechanically and through crowding-in), but governments should provide more information about instruments to save for retirement to all individuals

Thank you!

Work in progress – feedback is most welcome!

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# Appendix

## Summary statistics on all working-age individuals: demographics

	Mean	SD	P10	Median	P90	Obs.
Age	43.22	10.05	29	44	57	7,307,495
Female	0.51	0.50	0	1	1	7,307,495
Married	0.58	0.49	0	1	1	7,307,495
Number of children	0.77	1.06	0	0	2	7,307,495

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## Summary statistics on all working-age individuals: income

	Mean	SD	P10	Median	P90	Obs.
Total income	59,179	115,152	3,272	55,931	110,675	7,307,495
Main job earnings	52,806	53,241	0	50,682	107,895	7,307,495
Side job earnings	692	4,149	0	0	408	7,307,495
Self-emp. income	4,535	25,362	0	0	6,404	7,307,495
Business income	482	11,181	0	0	0	7,307,495
Financial income	1,598	84,271	0	64	1,465	7,307,495
Real estate income	-3,541	22,122	-7,733	0	160	7,307,495
Transfer income	657	4,123	0	0	0	7,307,495
Pension income	1,486	7,552	0	0	0	7,307,495
Other income	465	46,649	0	0	263	7,307,495

## Summary statistics on all working-age individuals: wealth

	Mean	SD	P10	Median	P90	Obs.
Net wealth	128,883	5,776,165	-19,891	24,125	259,116	7,307,495
Business wealth	10,681	126,461	0	0	2,769	7,307,495
Financial wealth	103,662	5,453,162	0	18,684	161,863	7,307,495
Real estate	106,128	388,002	0	0	301,225	7,307,495
Other wealth	7,728	268,638	0	0	9,450	7,307,495
Debt	-103,056	403,516	-300,000	-1,689	0	7,307,495

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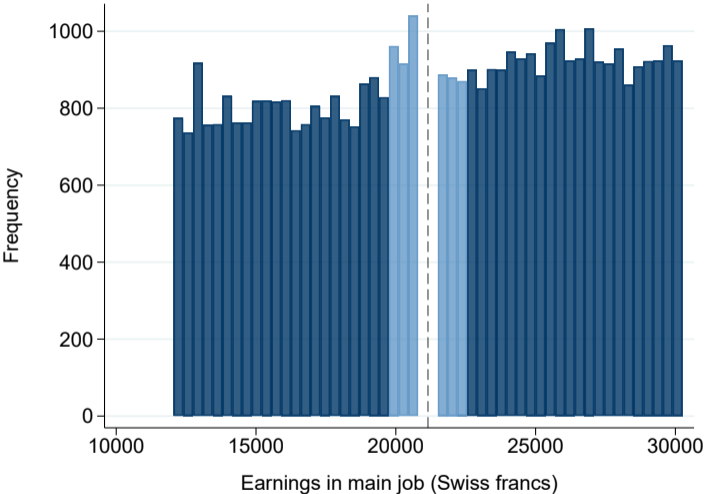


## Summary statistics on all working-age individuals: savings

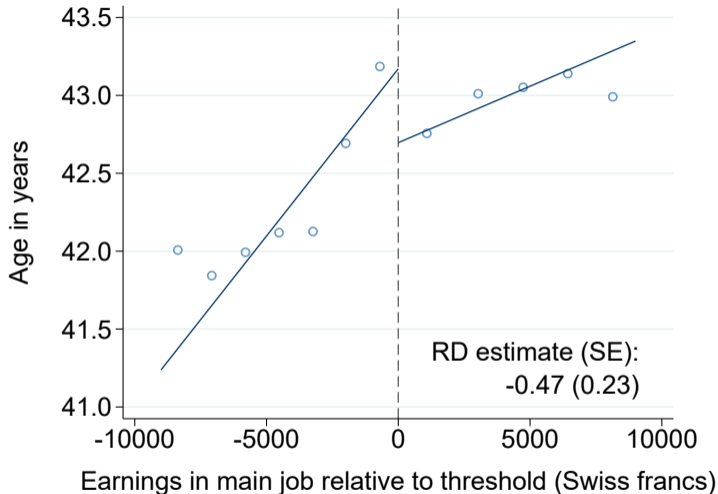
	Mean	SD	P10	Median	P90	Obs.
Total savings	16,978	2,211,579	-11,178	6,000	40,744	6,595,087
Occ. pension savings	3,262	3,286	0	2,527	8,721	7,307,495
Occ. pension buy-ins	698	10,216	0	0	0	7,307,495
Priv. pension savings	2,145	3,164	0	0	6,682	7,307,495
Priv. savings	10,668	2,211,494	-16,007	978	30,761	6,595,087

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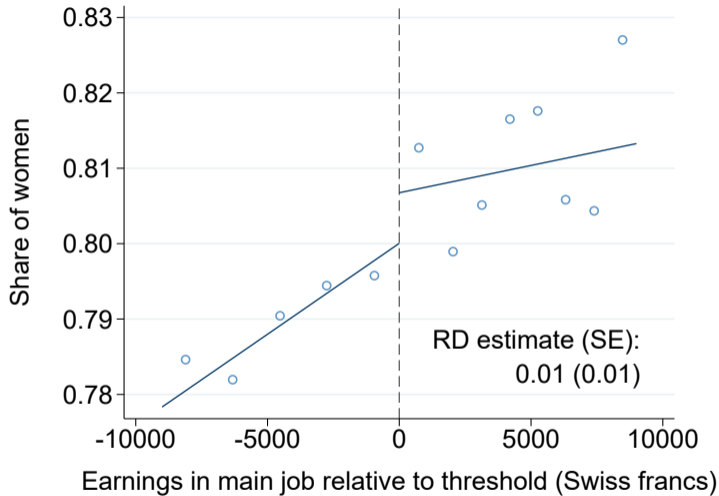
# Frequency distribution of earnings



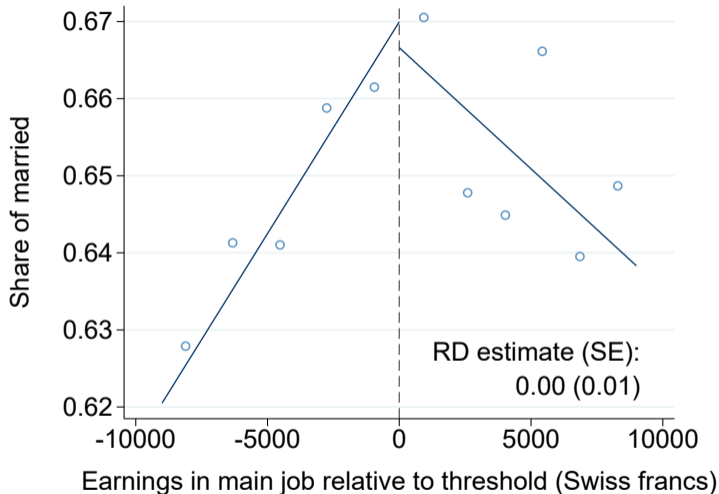
## Continuity of predetermined covariates: age



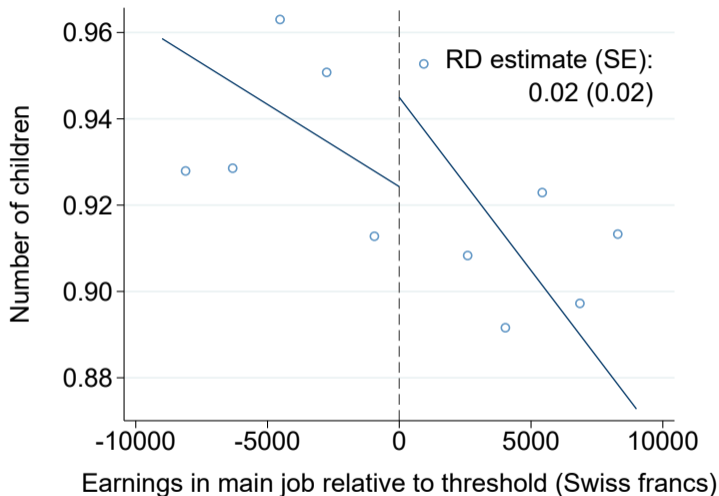
## Continuity of predetermined covariates: gender



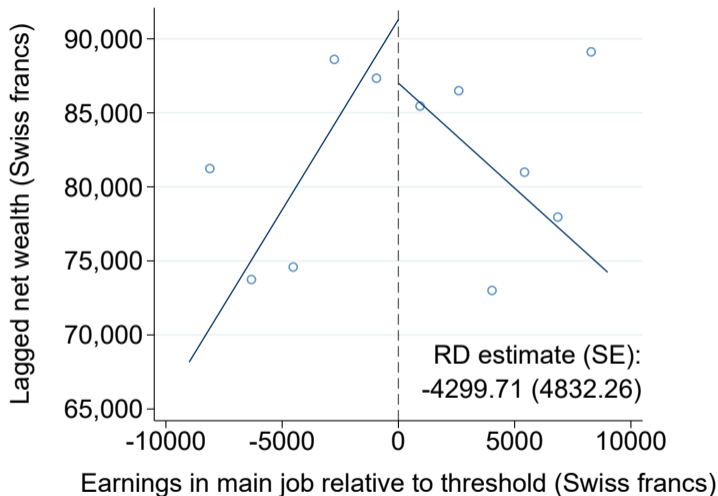
## Continuity of predetermined covariates: marital status



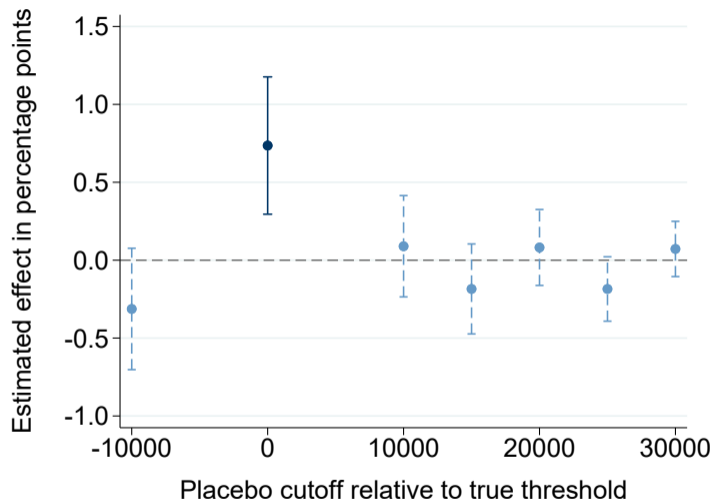
## Continuity of predetermined covariates: children



## Continuity of predetermined covariates: wealth

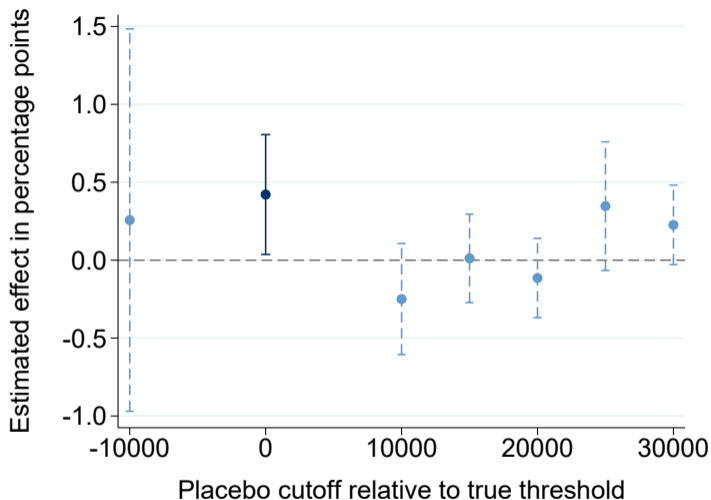


## Placebo check: private pension savings

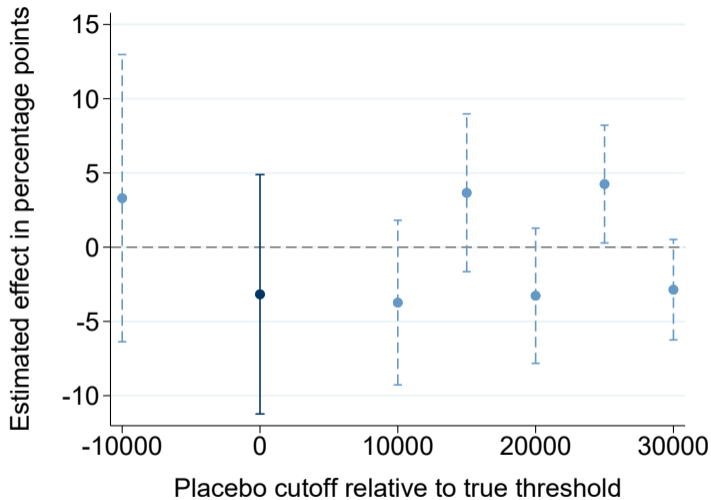




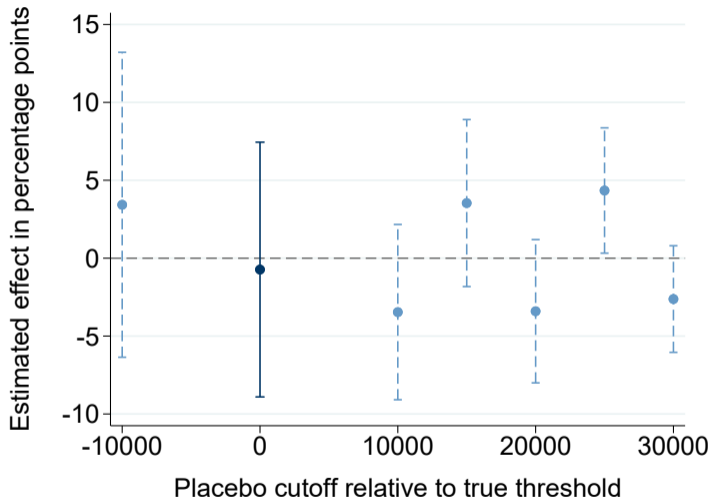
## Placebo check: occupational pension buy-ins



## Placebo check: private savings



## Placebo check: total savings



## Summary statistics of DD treatment group in 2004

	Mean	SD	P10	Median	P90
Age	41.92	7.33	31	42	52
Female	0.89	0.31	0	1	1
Married	0.77	0.42	0	1	1
Gross earnings main job	22,334	1,660	20,001	22,393	24,592
Net wealth	81,986	443,508	-19,948	24,377	215,059
Total savings rate (%)	21.1	159	-68.2	4.73	124
Occupational pension savings rate (%)	0	0	0	0	0
Occupational pension buy-in rate (%)	0.155	4.21	0	0	0
Private pension savings rate (%)	4.36	8.27	0	0	18.8
Private savings rate (%)	16.6	158	-71.9	2.19	115
Number of individuals			8,905		

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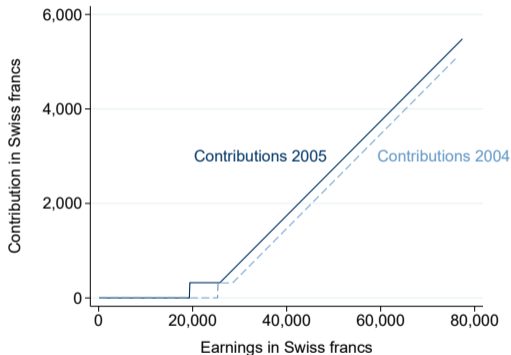
## Summary statistics of DD comparison group in 2004

	Mean	SD	P10	Median	P90
Age	41.15	7.28	31	41	51
Female	0.90	0.30	0	1	1
Married	0.78	0.41	0	1	1
Gross earnings main job	16,194	1,836	13,656	16,200	18,741
Net wealth	68,990	195,439	-16,862	23,564	194,577
Total savings rate (%)	22.1	178	-84.1	4.68	144
Occupational pension savings rate (%)	0	0	0	0	0
Occupational pension buy-in rate (%)	0.101	4.52	0	0	0
Private pension savings rate (%)	3.77	8.31	0	0	18.1
Private savings rate (%)	18.1	177	-87.2	2.56	134
Number of individuals			8,583		

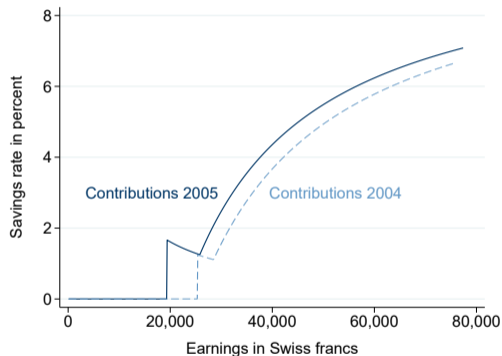
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# Change in contribution schedule due to 2005 reform

(A) Contribution levels in Swiss francs



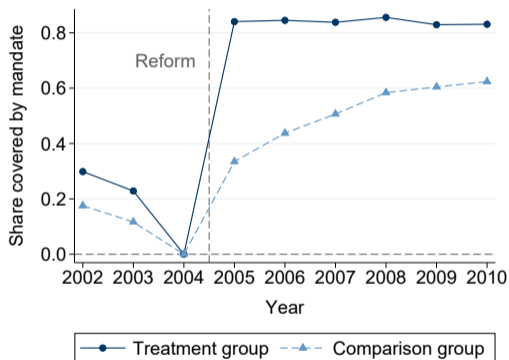
(B) Savings rates



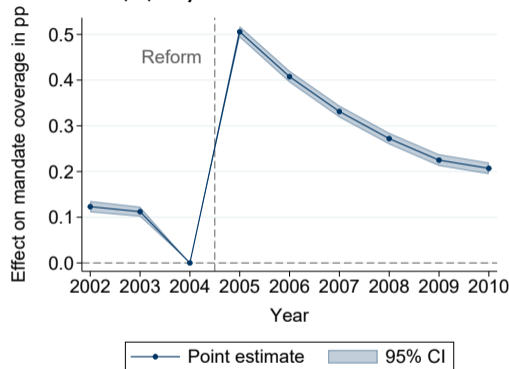
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# DD: exogenous variation in mandate coverage

(A) Share subject to mandate



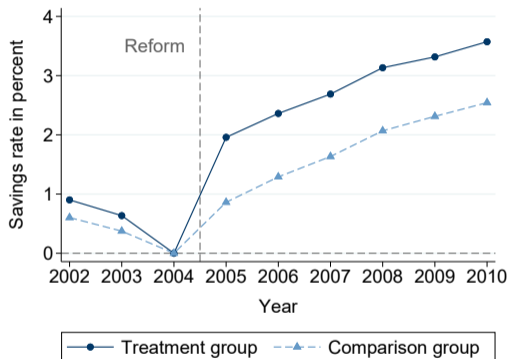
(B) Dynamic DD estimate



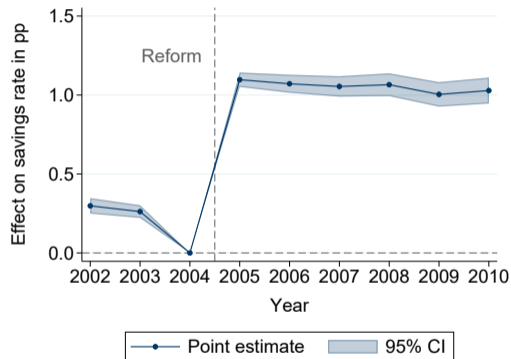
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# DD: exogenous variation in occupational pension savings

(A) Mean occ. savings rates



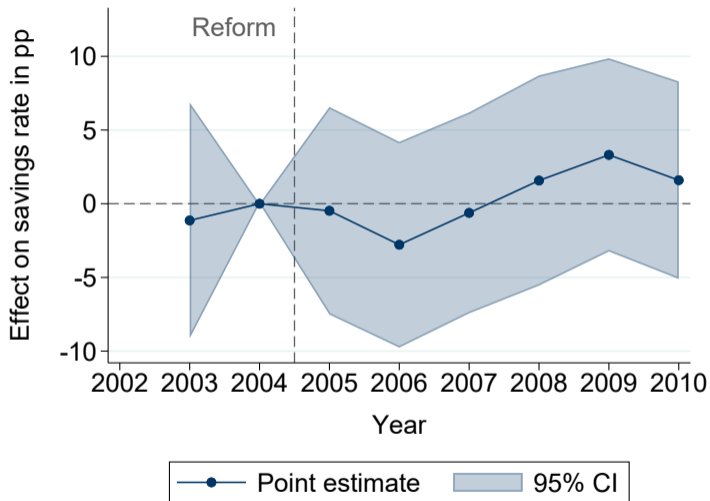
(B) Dynamic DD estimate



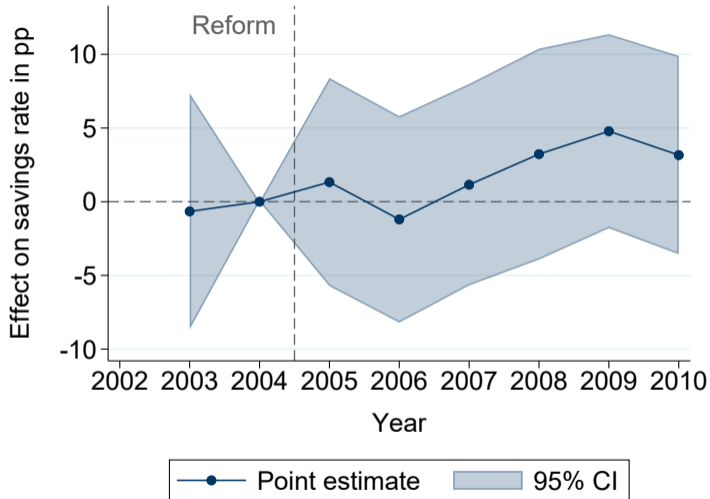
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# Dynamic effect on private savings



# Dynamic effect on total savings



## Crowding-in effect is concentrated among higher-income households

	Private pension savings	
	(1)	(2)
Static DD	0.31 *** (0.088)	
Static DD × low household income		-0.33 *** (0.097)
Static DD × high household income		0.95 *** (0.12)
Observations	157,392	157,392