How Do Consumers Finance Increased Retirement Savings?

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Motivation

- Governments around the world are heavily invested in promoting contributions to retirement plans...
  - Forced savings program: e.g., US Social Security contributions
  - Financial incentives: e.g., most OECD countries offer tax advantage for ret. savings
  - Non-financial instruments: e.g., auto-enrollment increasingly mandated

- ... yet we have limited understanding of the impact of $\uparrow$ saving **inside** retirement accounts on:
  - ... **net** wealth accumulation?
    - depends on the crowd-out of outside savings and debt
  - ... aggregate **welfare**?
    - little guidance on how to design tax-incentives, income caps, matching formulas

This paper

Q: What is the effect of increasing retirement contributions on **saving, borrowing**, **consumption** & **welfare**?

Challenge: need comprehensive personal finance data $\times$ retirement plan data

This paper:

1. Present a simple conceptual framework to assess welfare
2. Introduce new dataset with merged bank and pension account data
3. Estimate how UK savers financed an increase in default contribution rate
4. Draw some implications for retirement policy design

Literature: does retirement saving crowd-out private savings?

1. **Effect of Forced Saving** Feldstein '74; Attanasio and Brugiavinni '03; Attanasio and Rohwedder '03

- Some evidence of private saving crowd-out
- Chetty et al. '14: limited crowd-out but may not extrapolate to other programs
  - ↓ take-home pay is zero (↑ employer contrib.) or small (~\$50/*year* discontinuity in mandated saving)

2. **Effect of Saving Nudges** Madrian Shea '01; Choi et al. '04 '06; Blumenstock et al. '18; Cribb and Emmerson '16

- No effect on unsecured debt from AE (Beshears et al. '21)
  or text-message savings nudge (Medina and Pagel, '22)
- No direct evidence on the spending and liquid savings response to a savings nudges

Outline

Decision utility vs Normative utility

- Individual i chooses consumption (c_i), retirement contribution (ret_i), and liquid savings/borrowing (liq_i) taking γ—the generosity of retirement saving incentives ($s(.)$) and taxes ($\tau(.)$)—as given:

$$\max_{c_i, ret_i, liq_i} \quad u(\boldsymbol{c_i}) + \beta_i V_i(\boldsymbol{ret_i}, \boldsymbol{liq_i}, \pi_i)$$
$$s.t. \quad \boldsymbol{c_i} = y_i - \boldsymbol{liq_i} - \boldsymbol{ret_i} + s(\boldsymbol{ret_i}, \gamma) - \tau_i(\gamma)$$

- Social welfare when planner thinks each individual p_i% too impatient (e.g., due to present bias or externality for social safety programs):

$$W(\gamma) = \int_i \omega_i \left[u(c_i(\gamma)) + \beta_i (1 + p_i) V_i(ret_i(\gamma), liq_i(\gamma)) \right] di + \mu \int_i (\tau(a_i, \gamma) - s(b_{i,}(\gamma), \gamma)) \, di$$

Welfare effect of a small reform

- A small reform increasing the generosity of retirement saving incentives:

$$\frac{dW(\gamma)}{d\gamma} = \int_i \omega_i \left\{ \underbrace{\frac{dc_i}{d\gamma} u'(c_i)}_{\text{cons. response}} + \beta_i (1+p) \left[\underbrace{\frac{dret_i}{d\gamma} V_1'}_{\text{retirement sav. response}} + \underbrace{\frac{dliq_i}{d\gamma} V_2'}_{\text{crowd}-\text{out liquid sav.}} \right] \right\} di$$
$$+ \mu \int_i \left\{ \underbrace{\frac{d\tau_i(\gamma)}{d\gamma} - \frac{ds_i(\gamma)}{d\gamma}}_{\text{fiscal effect}} \right\} di$$

- If FOCs hold then **consumption** response is a **sufficient statistic** for welfare:

$$\frac{dW(\gamma)/d\gamma}{\mu} = \int_i \left\{ g_i p_i \left[\underbrace{\left(-\frac{dc_i}{d\gamma} \right)}_{\text{cons. response}} + \underbrace{\frac{ds_i}{d\gamma} - \frac{d\tau_i}{d\gamma}}_{\text{mechanical effect}} \right] \right\} di + \int_i \underbrace{(g_i - 1) \left[\frac{ds_i}{d\gamma} - \frac{d\tau_i}{d\gamma} \right]}_{\text{redistribution effect}} di$$

where $g_i = \frac{\omega_i u'(c_i)}{\mu}$ is the marginal social welfare weight on i

Welfare effect of a small reform

Abstracting from redistribution motive ($g_i = 1$) & assuming a budget neutral reform:

$$\frac{dW(\gamma)/d\gamma}{\mu} = \int_i \left\{ p_i \left[\underbrace{\left(-\frac{dc_i}{d\gamma} \right)}_{\text{change in behavior}} + \underbrace{\frac{ds_i}{d\gamma} - \frac{d\tau_i}{d\gamma}}_{\text{mechanical effect}} \right] \right\} di$$

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$$\frac{dW(\gamma)/d\gamma}{\mu} = \int_i \left\{ p_i \left[\underbrace{\frac{dret_i}{d\gamma}\left(-\frac{dc_i}{dret_i}\right)}_{\text{change in behavior}} + \underbrace{\frac{ds_i}{d\gamma} - \frac{d\tau_i}{d\gamma}}_{\text{mechanical effect}} \right] \right\} di$$

- If the planner is not paternalistic ($p_i = 0$): no welfare effect
- Average Treatment Effect, $E\left(\frac{dret_i}{d\gamma}\right)$, is a poor guide for welfare: what matters are the **covariances** (Alcott and Taubinsky, 2023)
  - **Homogeneous bias:** target those with larger spending response $cov\left(\frac{dret_i}{d\gamma}, \frac{-dc_i}{dret_i}\right) > 0$
  - **Heterogeneous bias:**
    - Even if zero crowd-out ($\frac{dc_i}{d_{ret_i}} = -1$), welfare can $\downarrow$ if $cov\left(p_i, \frac{ds_i}{d\gamma} - \frac{d\tau_i}{d\gamma}\right) < 0$
    - Even if complete crowd-out ($\frac{dc_i}{d_{ret_i}} = 0$), policy can $\uparrow$ welfare if $cov\left(p_i, \frac{ds_i}{d\gamma} - \frac{d\tau_i}{d\gamma}\right) > 0$

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- Average Treatment Effect, $E\left(\frac{dret_i}{d\gamma}\right)$, is a poor guide for welfare: what matters are the **covariances** (Alcott and Taubinsky, 2023)
- To measure $\frac{dc_i}{dret_I}$ and assess these covariances, we need:
  - $\rightarrow$ Data on c_i and ret_i
  - $\rightarrow$ Policy variation that changes saving incentives ($d\gamma$)

Outline

New Dataset on Saving, Spending, Borrowing

UK Bank customer data 2012-2019

- Monthly flows:
  - Spending in aggregate categories from checking account and credit cards
  - Employment earnings and other income receipts
- Month-end balances:
  - Checking accounts, savings accounts, credit card balances
  - Mortgage and non-mortgage debt balances
- Annual demographic characteristics (age, gender)

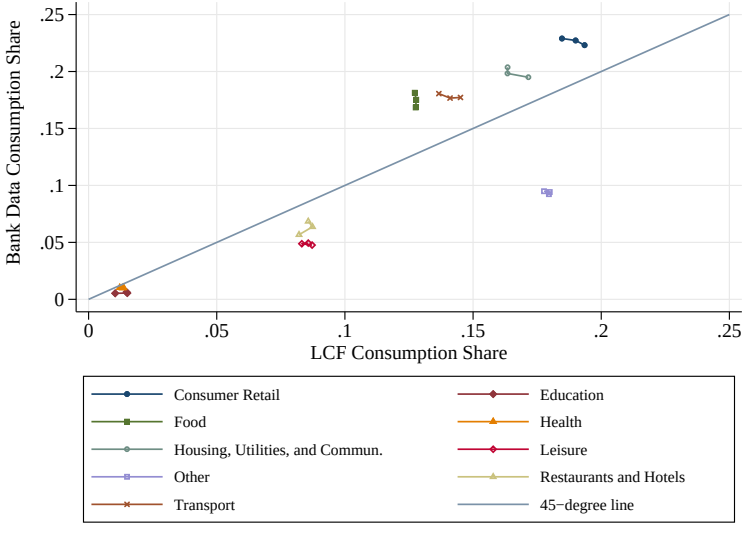
... merged w/ large UK pension provider data

- Monthly pension contributions + balances

Data caveats

- Data only captures what is observed by our partner bank
- Affects debt products especially (loans, CCs with other banks)
  - Restrict data to those with paycheck deposited in their current account with partner bank $\Rightarrow$ can see outflows and transfers
- Debit card share of UK card spending is 90%

Budget shares line up with representative survey data



(Simplified) Policy Variation

Context: National Auto-Enrollment policy for all UK private sector employees

Variation: min. defaut contribution rate stepped up in April 2018 and April 2019

Effective date	Min. total contribution	Min. employer default contrib.	Employee default contrib.
Rollout btw. Oct '12 & April '17	2%	1%	1%
Effective April 2018	5%	2%	3%
Effective April 2019	**8%**	**3%**	**5%**

Policy = change in default + large change in incentives

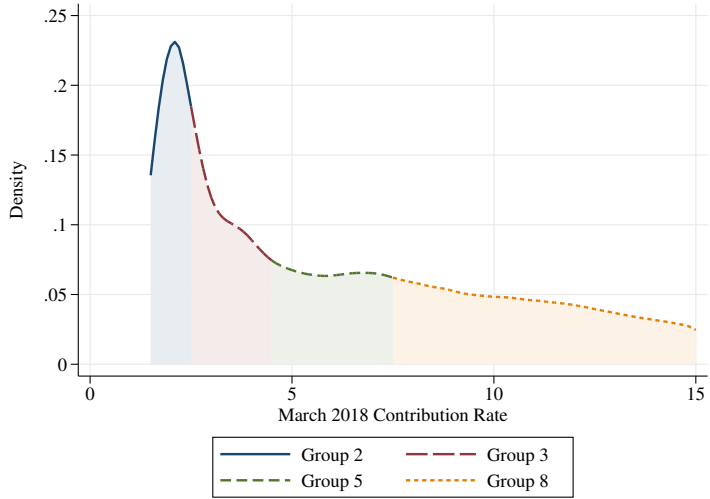
- Employees and firms can choose to contribute $>$ minimum
- But employees lose **all** employer contributions if contribute $<$ minimum
- Policy increases financial returns to participating from 1% to 3% of salary

$\Rightarrow$ Stronger teeth than typical AE nudge:

$\uparrow$ default option $+$ $\uparrow$ financial incentives

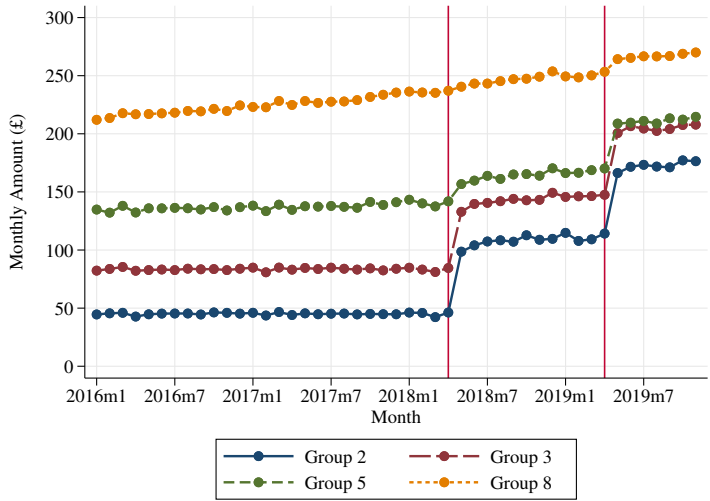
Empirical Strategy: below vs above the new default

Distribution of March 2018 Total Contribution Rates by Group



Treated groups' contributions show strong reaction

Average monthly total pension contributions by contribution rate group



Employer contrib. determine group assignment

We have data on split between employee/employer contributions for ~20% of participants

Outline

Empirical Approach

Two dimensions of comparison:

1. **Pre- vs post- policy change:** control for time-invariant individual characteristics
2. **Affected vs not affected**: control for time trends

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Approach 1: Treatment effect from policy ($\frac{\partial c_i}{\partial \gamma}$) using Dynamic Event Study (Sun and Abraham, 2021) relative to AE date E_i

$$Outcome_{it} = \beta \cdot \sum_{\ell} \mu_\ell \mathbb{1}\{t - E_i = \ell\} + \alpha_i + \gamma_t + \varepsilon_{it}$$

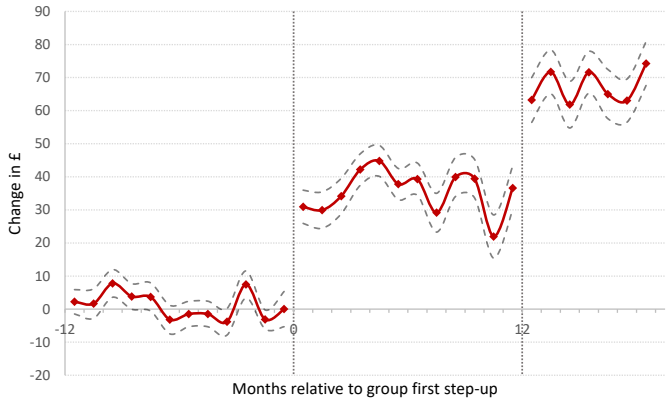
Approach 2: Elasticity to changes in contributions ($\frac{\partial c_i}{\partial ret_i}$) using 2SLS

$$Outcome_{it} = \beta \cdot PensionContributions_{it} + \alpha_i + \gamma_t + \varepsilon_{it}$$

$$Pension\ Contributions_{it} = \sum_{s \in \{1,2\}} \sum_{k \in \{2,3,5\}} \pi_{ks} Group_i^k \times Post_t^s + \psi_i + \phi_t + v_{it}$$

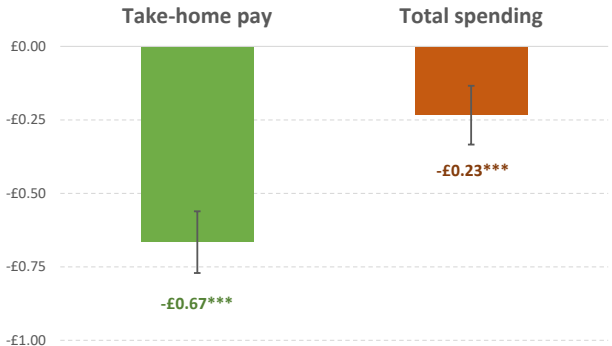
Result I: ↓ in take-home pay and total spending

In April 2018 and 2019: ↑ employee default by 2% and employer default by 1% ...



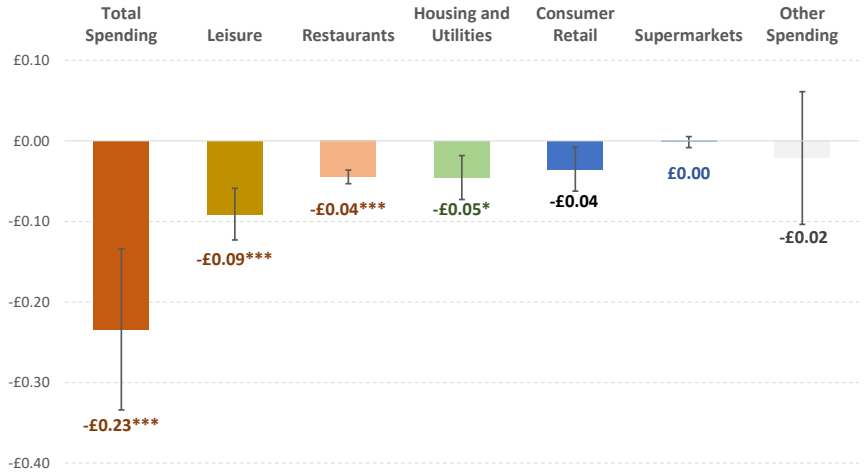
Result I: ↓ in take-home pay and total spending

- For every £1 increase in pension contribution:
  - 2/3 come from higher employee contrib. and lower take-home pay
  - ~1/3 of this income reduction is financed with reduced spending



Result II: larger ↓ in discretionary spending

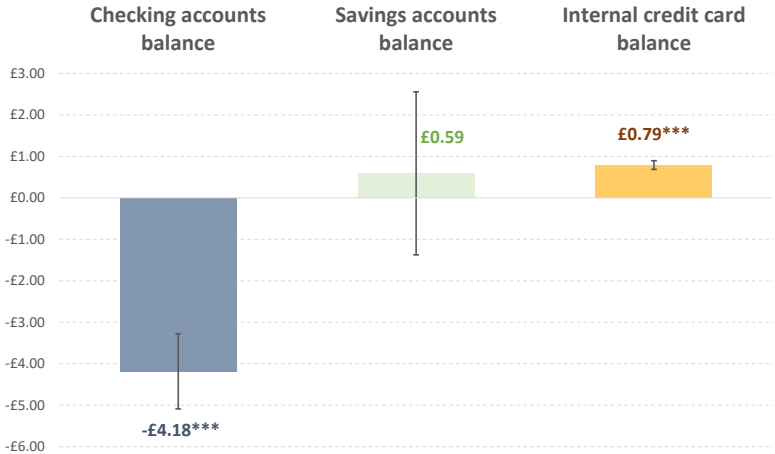
Pension contrib ↑ by £1 ⇒ take-home pay ↓ 67 cts ⇒ total spending ↓ 23 cts



Result III: ↓ in checking account balances

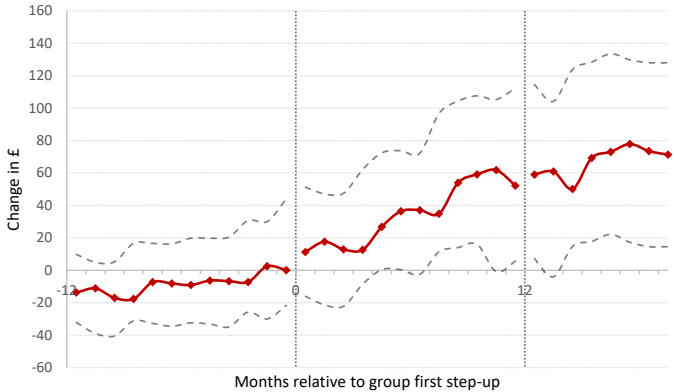
Flows: pension ↑ by £1/month ⇒ take-home pay ↓ 67cts/month

Stocks: avg. checking account balance ↓ £4.18 and CC balance ↑ 79cts



Result III: ↓ in checking account balances

Avg. credit card balance ↑ (≠ Beshears et al, 21; Medina and Pagel '22)



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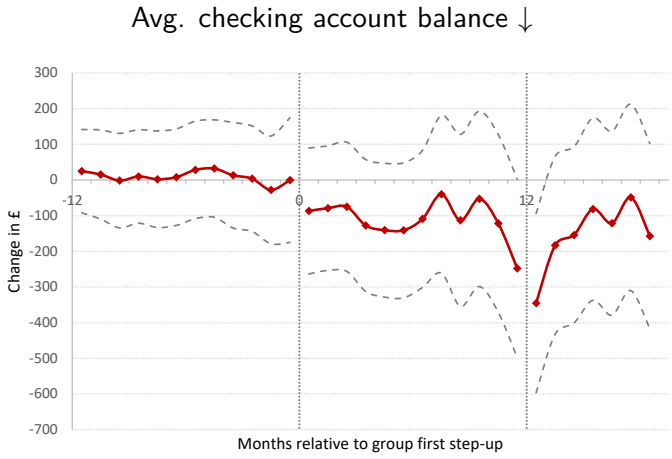
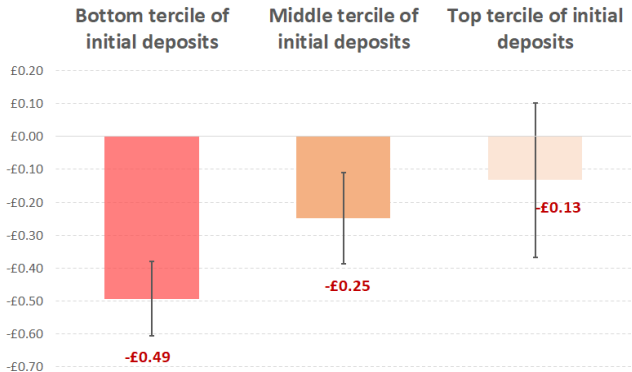


Result IV: Heterogeneity in Spending Responses

Pension ↑ by £1/month ⇒ take-home pay ↓ 67cts/month

Heterogeneity: ↓ 54cts for low initial deposits vs ↓ 24cts for high initial deposits



Outline

Policy discussion

Abstracting from redistribution ($g_i = 1$) and assuming a budget neutral reform:

$$\frac{dW(\gamma)/d\gamma}{\mu} = \int_i \left\{ p_i \left[\underbrace{\frac{dret_i}{d\gamma}\left(-\frac{dc_i}{dret_i}\right)}_{\text{change in behavior}} + \underbrace{\frac{ds_i}{d\gamma} - \frac{d\tau_i}{d\gamma}}_{\text{mechanical effect}} \right] \right\} di$$

- **Tax & match incentives:** often poorly targeted:
  - Taken up by those with more liquidity (Choukhmane et al, '23) who have ...
  - ... smallest spending response and likely less biased $cov\left(\frac{dret_i}{d\gamma}, p_i\right) < 0$
- **Income/asset caps:** can be desirable even absent a redistributive motive
  - At the top, liquidity constraints do not bind $\Rightarrow$ low efficiency gains
- **Illiquidity:** new argument against higher **withdrawal penalties**:
  - May $\uparrow$ savings but worsen targeting (i.e., less desirable for low-liquidity individuals) (Briere, Poterba, Szafraz, '22; Mitchell, Utkus, Yang, '07)

Conclusion

What is the welfare effect of an intervention promoting retirement savings?

- Consumption response to the intervention is a sufficient statistics for welfare
- Covariance between contribution response, elasticity of consumption, and bias determines social welfare ($\neq$ Average Treatment Effect)

How do consumers finance increase retirement contributions?

- For every £1 $\downarrow$ in take-home pay, we see £0.35-40 reduction in spending
- The rest is financed out of liquid savings credit card debt
- Stronger spending response for those w/ low initial checking account balances

How to design retirement saving programs?

- Target incentives at more liquidity constrained individuals