Wealth Taxation and Wealth Accumulation: Theory and Evidence From Denmark

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New Interest in Wealth Taxes

Policy debate motivated by rising wealth inequality

- ▷ Progressive wealth taxes can redistribute wealth
- ▷ But how do they affect wealth accumulation?
- ▷ Little evidence on this equity-efficiency trade-off

Empirical challenges:

- ▷ Limited micro data on wealth
- ▷ Difficult to find compelling wealth tax variation
- ▷ Wealth is very concentrated $\rightarrow$ we need variation at the very top

Danish Data and Experiment

Data:

- ▷ Admin micro data on wealth for the full population since 1980

Experiment:

- ▷ Denmark used to have a wealth tax of 2.2% above an exemption threshold at around the 98th percentile of the wealth distribution
- ▷ The tax was reduced in 1989-91 and eliminated in 1996-97
- ▷ The design of the tax allows for DD strategies to capture responses at the very top of the wealth distribution

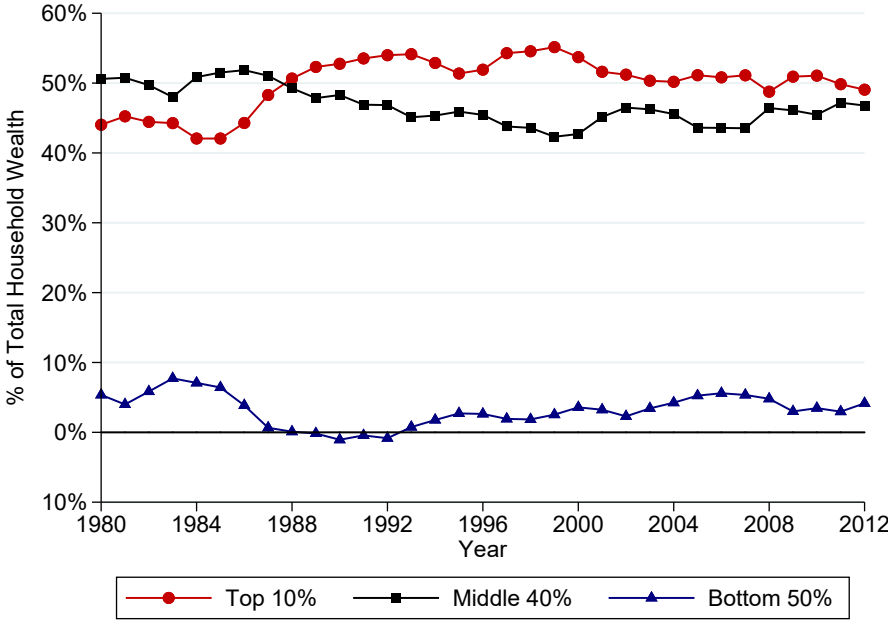
Wealth Tax Rate Over Time

Outline

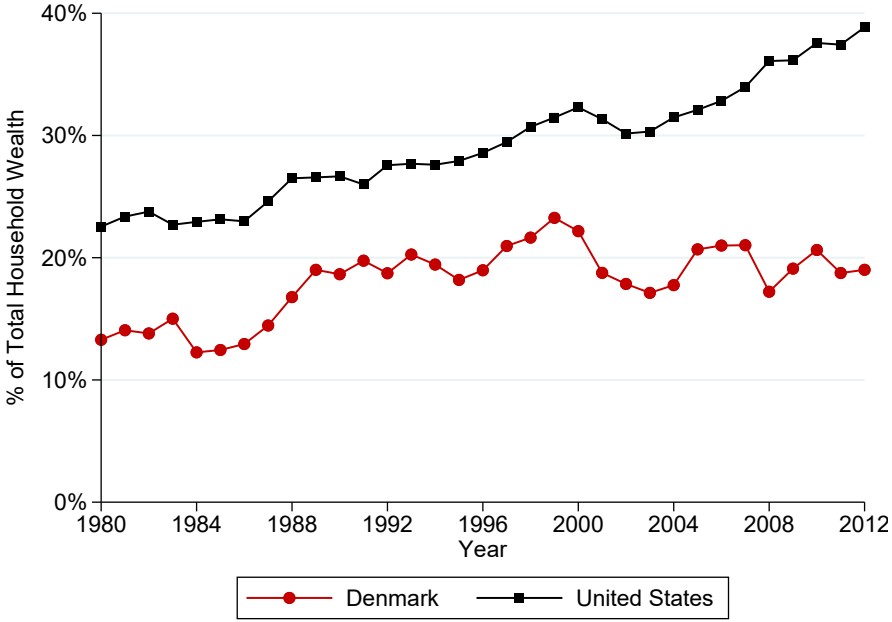
1. Wealth inequality in Denmark over time
   - ▷ Contrast Danish and US experiences
2. Effect of wealth taxes: Evidence
   - ▷ Quasi-experimental study of wealth tax cuts
3. Effect of wealth taxes: Theory
   - ▷ Which parameters govern the effect?
   - ▷ What do the reduced-form impacts identify?
4. Connecting theory and evidence
   - ▷ Calibrate model to quasi-experiment $\rightarrow$ long-run effects

Wealth Inequality in Denmark

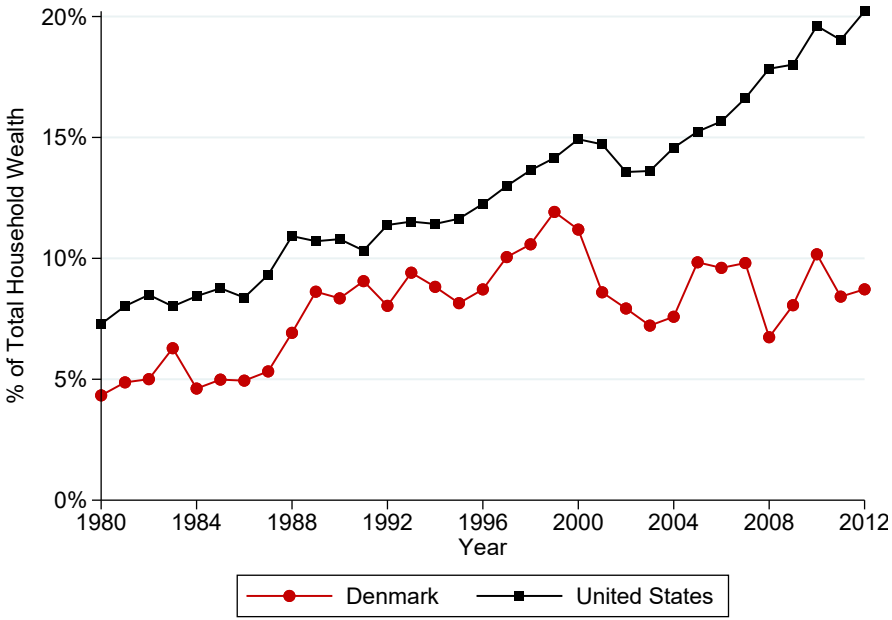
Wealth Distribution in Denmark



Top 1% Wealth Share: Denmark vs US



Top 0.1% Wealth Share: Denmark vs US



Effect of Wealth Taxes: Evidence

Danish Wealth Tax

Tax base:

- ▷ Taxable wealth equals total net wealth, excluding pensions
- ▷ Taxable components are deposits, bonds, equities, housing, large durables and business assets, net of any debts

1989-1991 reform:

- ▷ Exemption threshold doubled for couples
- ▷ Tax rate reduced from 2.2% to 1%

DD Strategies

Couples DD

- ▷ Use doubling of exemption threshold for couples
- ▷ Compare couples vs. singles inside affected range
- ▷ Responses by the moderately wealthy (98th-99th percentile)

Ceiling DD

- ▷ Use tax ceiling: All personal taxes / income $\leq 78\%$
- ▷ Compare households bound and unbound by ceiling
- ▷ Responses by the very wealthy (top 1%)

DD Specification

Reduced-form (intent-to-treat) specification:

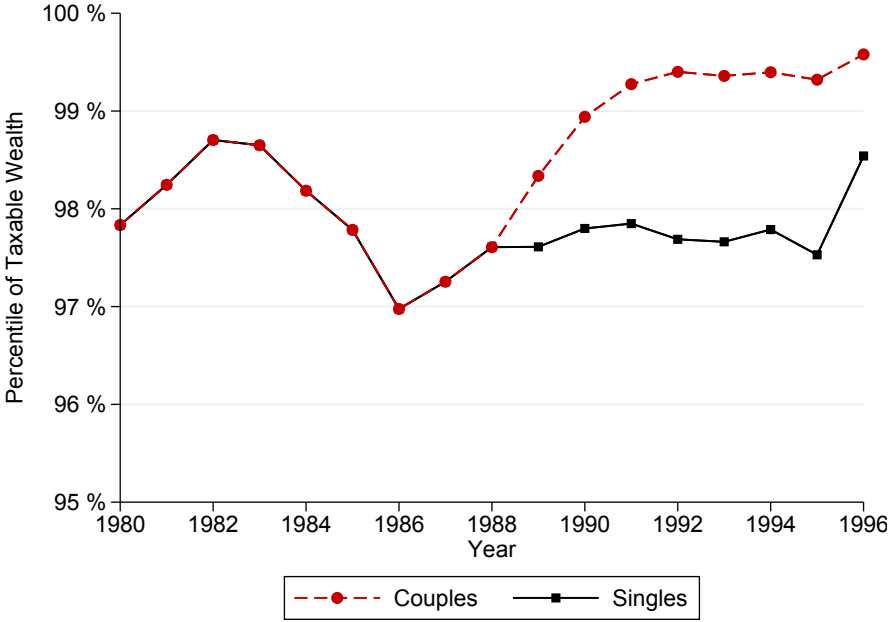
$$\log W_{it} = \sum_{j \neq 1988} \beta_j^C \, Year_{j=t} + \sum_{j \neq 1988} \beta_j^T \, Year_{j=t} \, Treat_i + \gamma_i + \nu_{it}$$

Treatment and control groups defined by pre-reform characteristics (1982-88 in baseline)

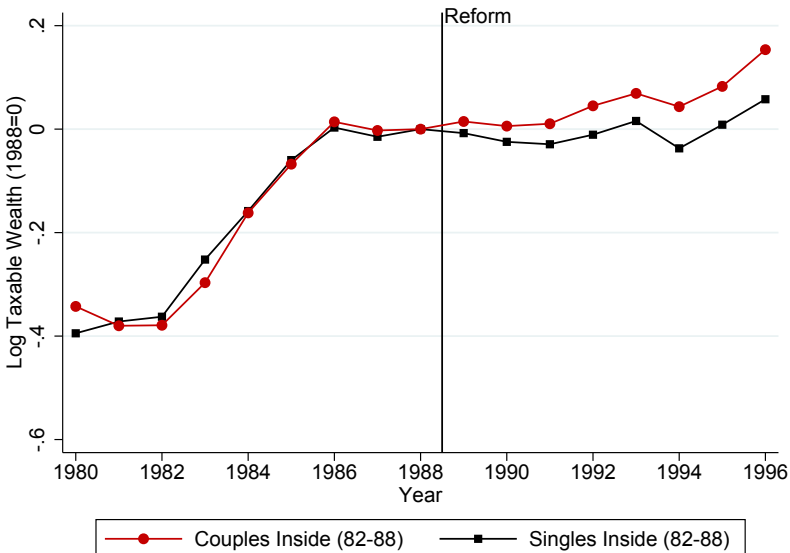
Balanced panel 1980–1996

Couples DD

Exemption Threshold Over Time



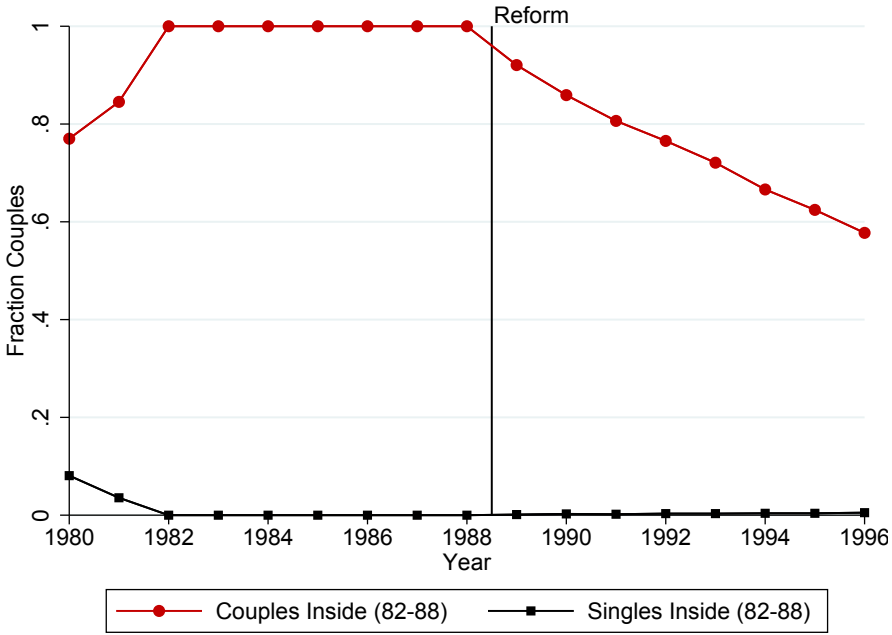
Taxable Wealth of Couples vs. Singles Inside Exempted Range



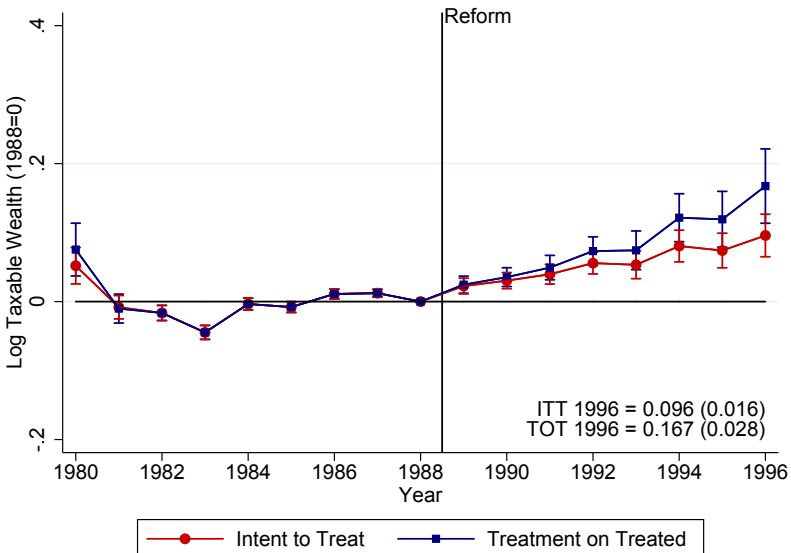
Window

Difference in Taxable Wealth Between Couples & Singles Inside Exempted Range

Persistence of Treatment Status

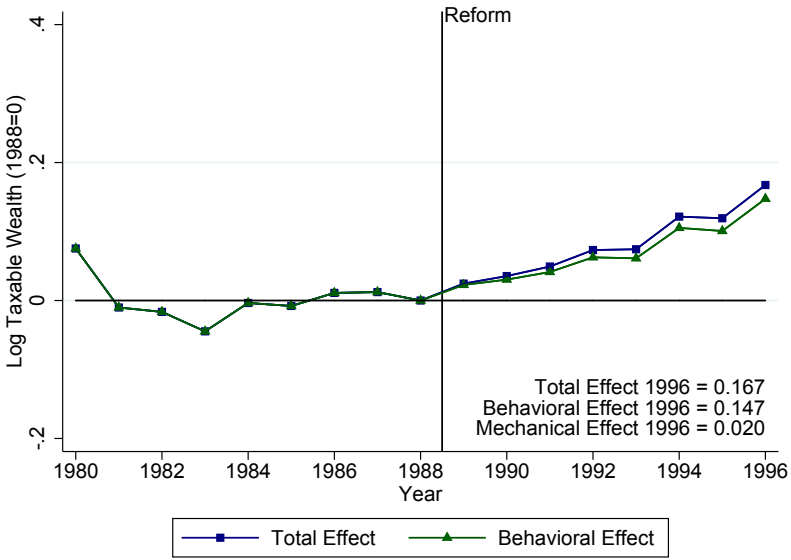


Intent to Treat vs Treatment on Treated



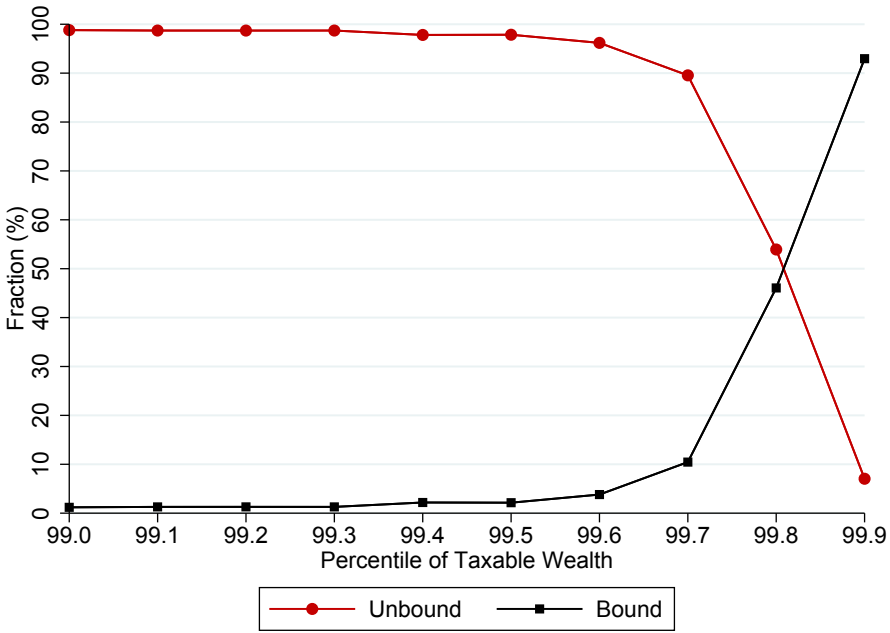
Placebo

Behavioral vs Mechanical Effects

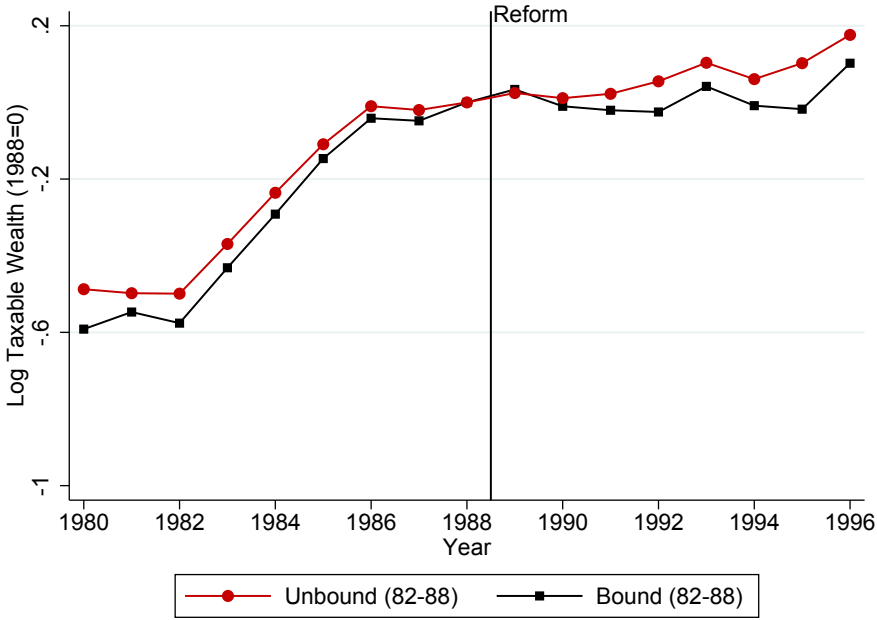


Ceiling DD

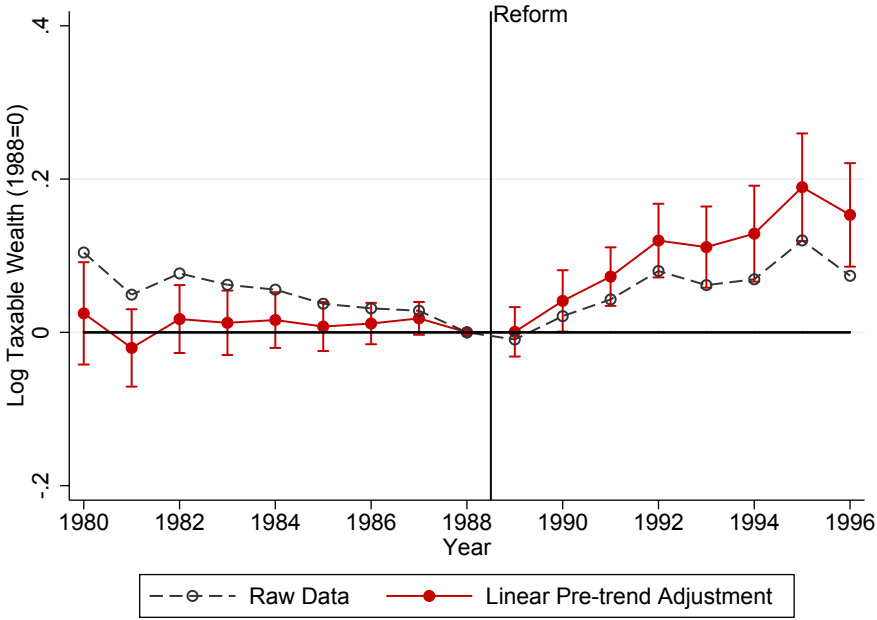
Fraction of Households Bound and Unbound by Ceiling in 1988



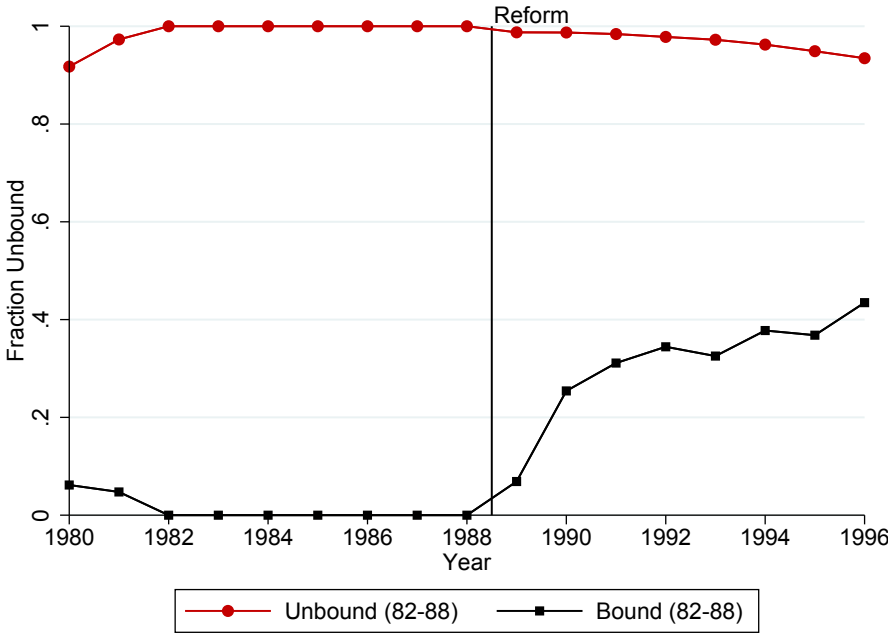
Taxable Wealth of Households Bound and Unbound by Ceiling



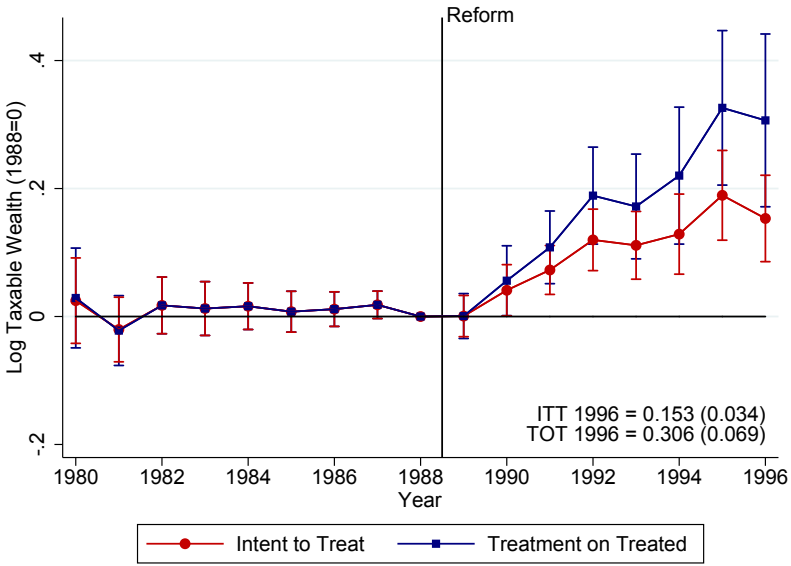
Difference in Taxable Wealth Between Bound and Unbound Households



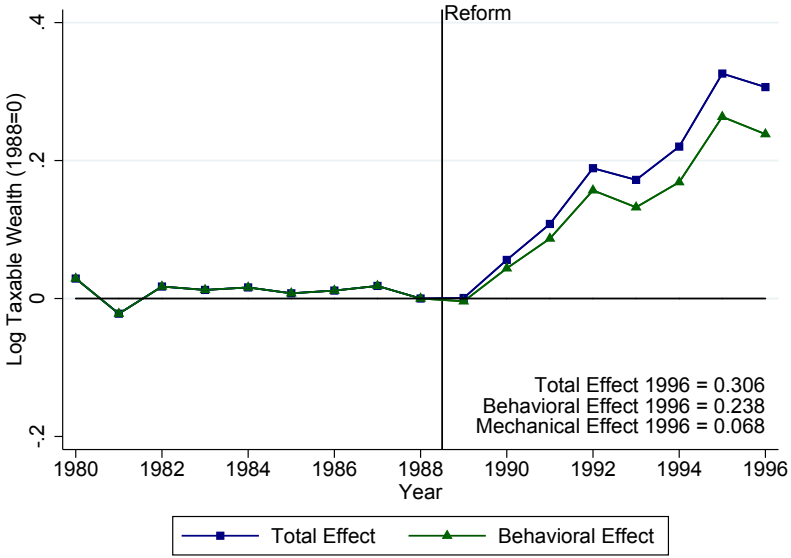
Persistence in Bound vs. Unbound Treatment Status



Intent to Treat vs Treatment on Treated



Behavioral vs Mechanical Effects



Effect of Wealth Taxes: Theory

Develop Model for Empirical Setting

Two facts:

- ▷ Wealthy people are older people
- ▷ Wealthy people accumulate wealth into very old ages, and die with a lot of wealth

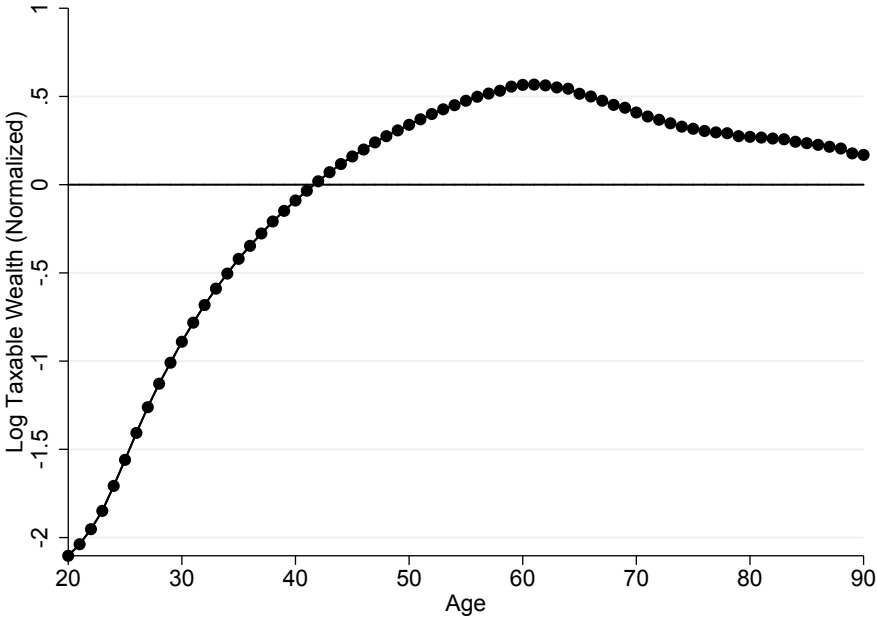
Model of savings responses:

- ▷ Allow for lifecycle motive
- ▷ Allow for bequest motive (or utility-of-wealth motive)
- ▷ Leave out precautionary motive (second order here)

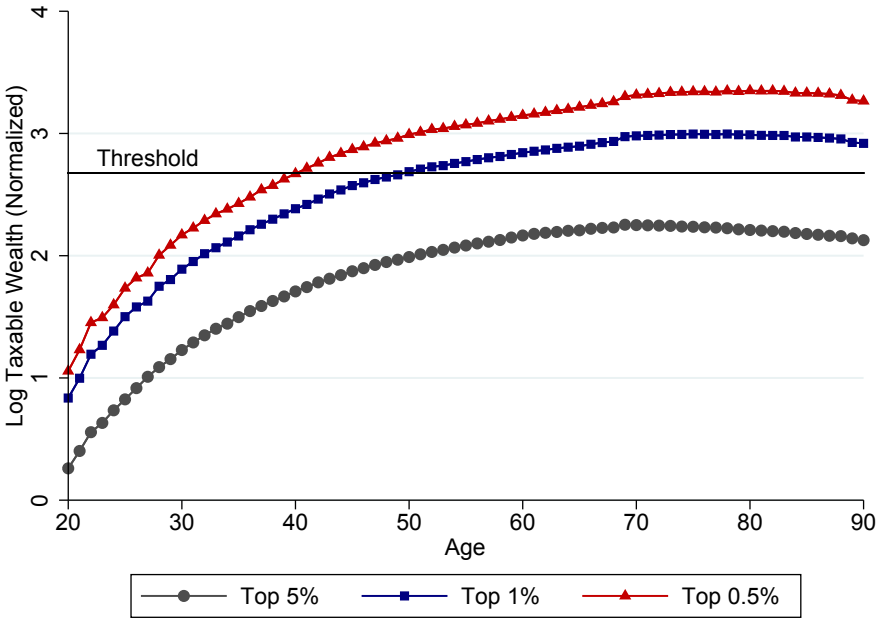
Abstract from labor supply and entrepreneurship responses:

- ▷ No evidence of labor supply responses to the wealth tax reform

Lifecycle Profile of Wealth in the Full Population



Wealth Profiles at the Top
Age Range 20-90



Lifecycle Model With Utility of Wealth

Preferences over consumption and residual wealth:

$$\frac{\sigma}{\sigma-1}\sum_{t=0}^{T}\delta^{t}\left(c_{t}\right)^{\frac{\sigma-1}{\sigma}}+\delta^{T}V\left(W_{T+1}\right)$$

Utility of residual wealth:

$$V\left(W_{T+1}\right)=A\frac{\alpha}{\alpha-1}\left(\frac{W_{T+1}}{A}\right)^{\frac{\alpha-1}{\alpha}}$$

Period-t budget:

$$c_{t}=y_{t}+RW_{t}-\tau R\left(W_{t}-\bar{W}\right)-W_{t+1}$$

Period-1 Reduced-Form Effect

$$\frac{dW_1}{d(1-\tau)}\frac{1-\tau}{W_0} = \sigma \cdot \left\{ \frac{\sum_{t=0}^{T} t q_t}{\sum_{t=0}^{T} q_t + q_b \frac{\alpha}{\sigma} c_0^{\alpha/\sigma - 1}} \frac{c_0}{W_0} \right\}$$
$$+\alpha \cdot \left\{ \frac{T q_b}{\sum_{t=0}^{T} q_t + q_b \frac{\alpha}{\sigma} c_0^{\alpha/\sigma - 1}} \frac{c_0^{\alpha/\sigma}}{W_0} \right\}$$
$$+\frac{dW_0^C}{d(1-\tau)}\frac{1-\tau}{W_0} \cdot \left\{ \frac{1}{\sum_{t=0}^{T} q_t + q_b \frac{\alpha}{\sigma} c_0^{\alpha/\sigma - 1}} \right\}$$

where $q_t \equiv \frac{(\delta(1-\tau)R)^{t\sigma}}{((1-\tau)R)^t}$ and $q_b \equiv \frac{A(\delta(1-\tau)R)^{T\alpha}}{((1-\tau)R)^T}$

- ▷ Substitution effect on consumption proportional to σ (positive)
- ▷ Substitution effect on bequests proportional to α (positive)
- ▷ Wealth effect (negative)

Period-t Reduced-Form Effect

$$\frac{dW_t/W_t}{d\left(1-\tau\right)/\left(1-\tau\right)} = dM + dB$$

- dM is the **mechanical effect** of larger net-of-tax returns
- dB is a **behavioral effect** given by

$$dB = \sum_{j=0}^{t-1} \frac{q_j}{\left[\left(1-\tau\right)R\right]^{1-t}} \left\{ \frac{dW_1/W_0}{d\left(1-\tau\right)/\left(1-\tau\right)} \frac{W_0}{W_t} - j\sigma \frac{c_0}{W_t} \right\}$$

where $\frac{dW_1/W_0}{d(1-\tau)/(1-\tau)}$ is the one-period effect characterized above

Connecting Theory and Evidence

Calibration Approach

Calibrate to two experiments and samples:

- ▷ Couples DD: Moderately wealthy ("top 1%" btw 60-90 years)
- ▷ Ceiling DD: Very wealthy ("top 0.3%" btw 60-90 years)

Calibrate A, δ, R, W_0 to fit the empirical lifecycle profile of wealth before the reform

- ▷ A is key for fitting end-of-life wealth W_{T+1}

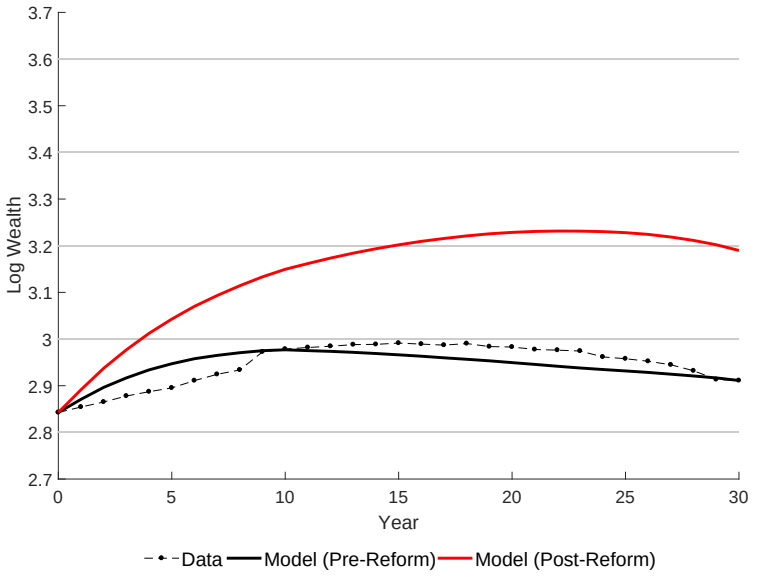
Calibrate σ and α to quasi-experimental moments:

- ▷ Time path of TOT estimates in years 1,...,8
- ▷ Flat wealth profile at the end of life (before and after)

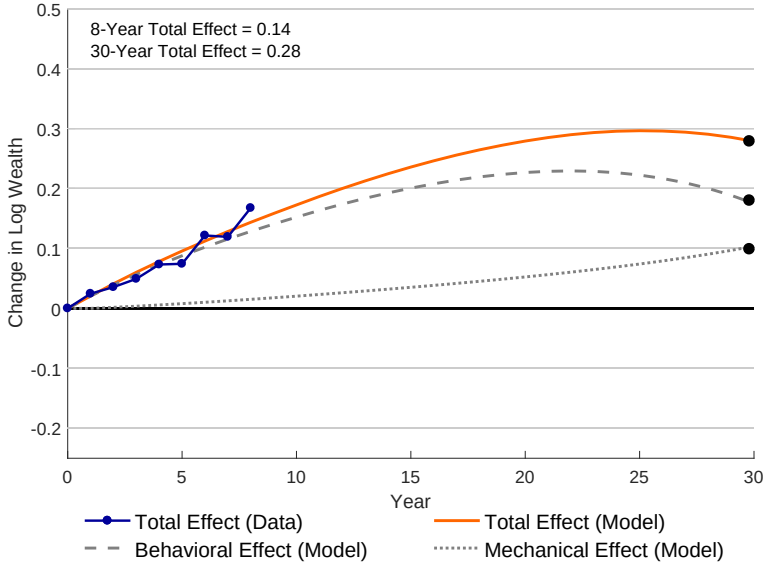
Top Percentiles | Before vs After | Balanced

Calibrating to Couples DD (Moderately Wealthy)

Observed and Simulated Wealth Paths

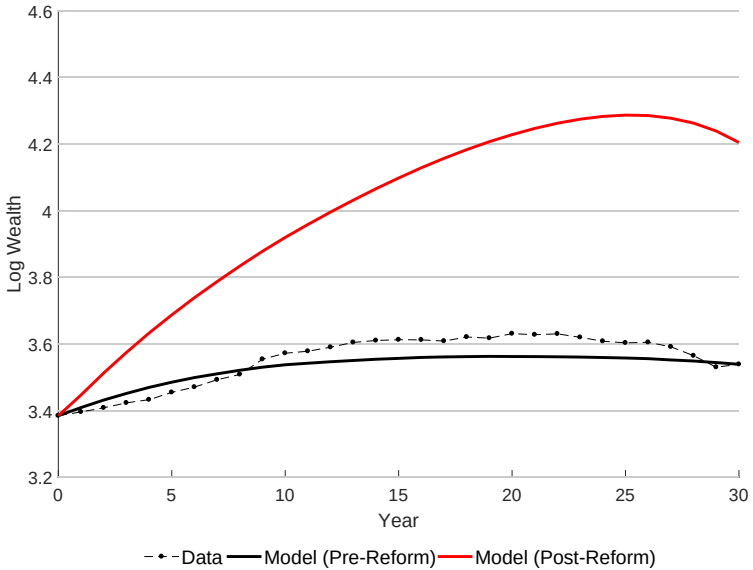


Long-Run Effect of Reform: Model vs Evidence



Calibrating to Ceiling DD (Very Wealthy)

Observed and Simulated Wealth Paths



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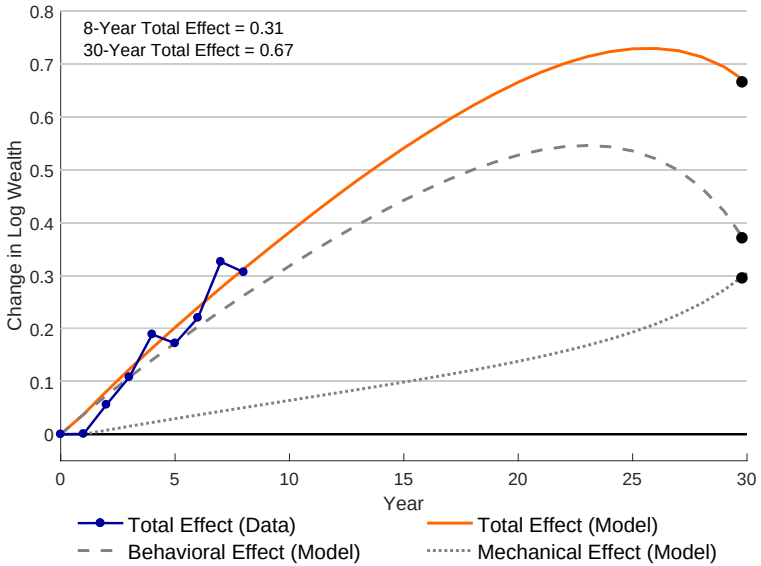
Long-Run Effect of Reform: Model vs Evidence



Conclusions

We contribute to a nascent literature on wealth taxes

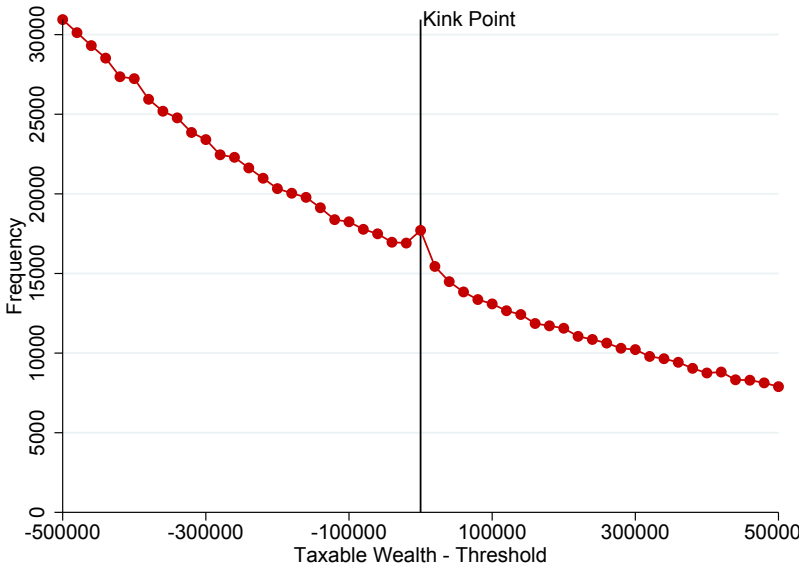
- ▷ We study the very wealthiest individuals
- ▷ We exploit a very large quasi-experiment
- ▷ We link reduced-form impacts to structural parameters, and simulate long-run effects
- ▷ We find sizeable long-run effects

What's still missing?

- ▷ Aspiration effects of wealth taxes
- ▷ Migration effects of wealth taxes
- ▷ General equilibrium effects of wealth taxes

Appendix

Empirical Distribution Around Kink (1980-96)



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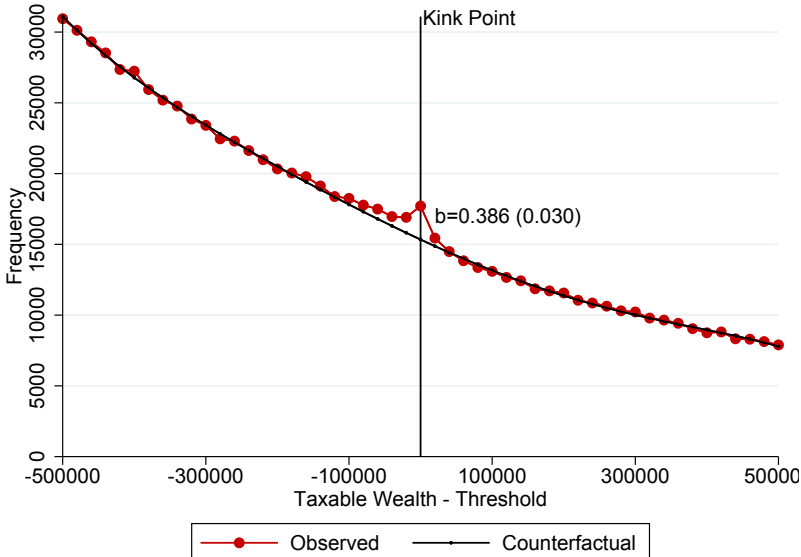
Empirical vs Counterfactual Distribution (1980-96)



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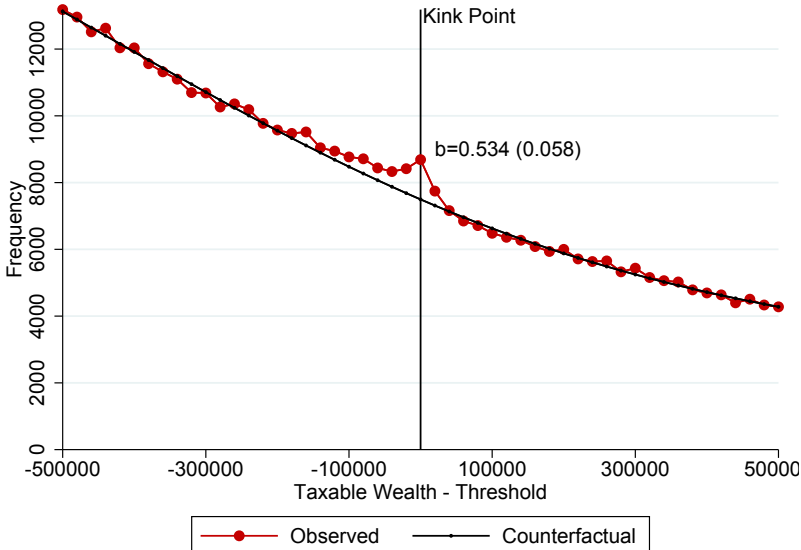
Bunching for the Self-Employed



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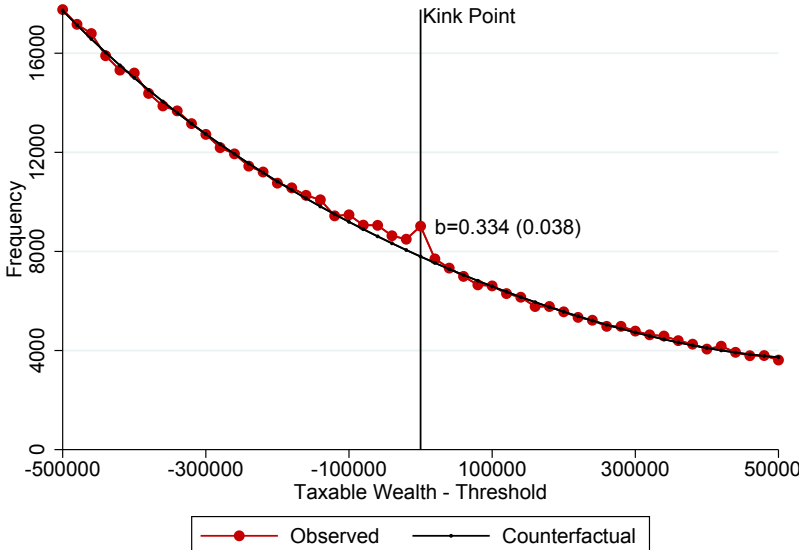
Bunching for Employees



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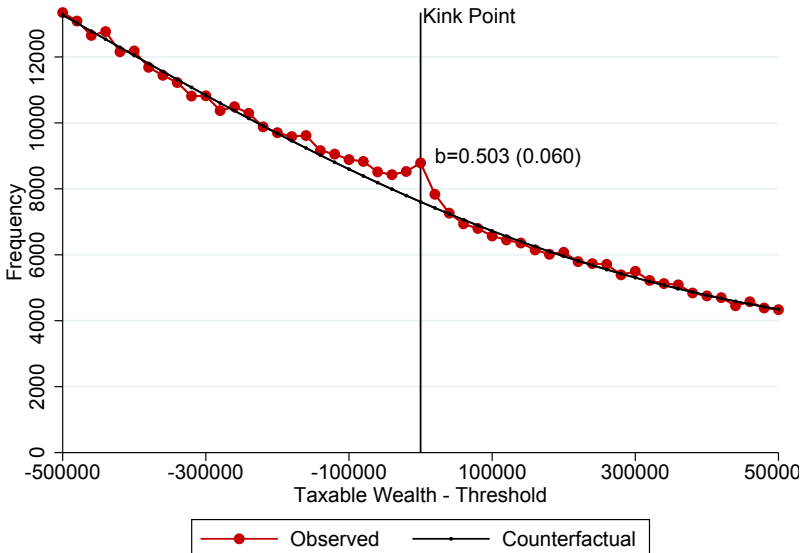
Bunching for "Non-Ordinary" Taxpayers



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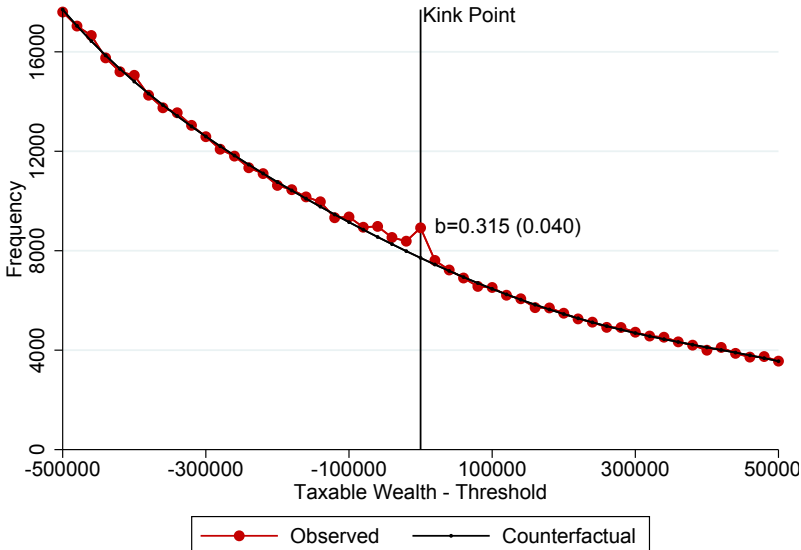
Bunching for "Ordinary" Taxpayers



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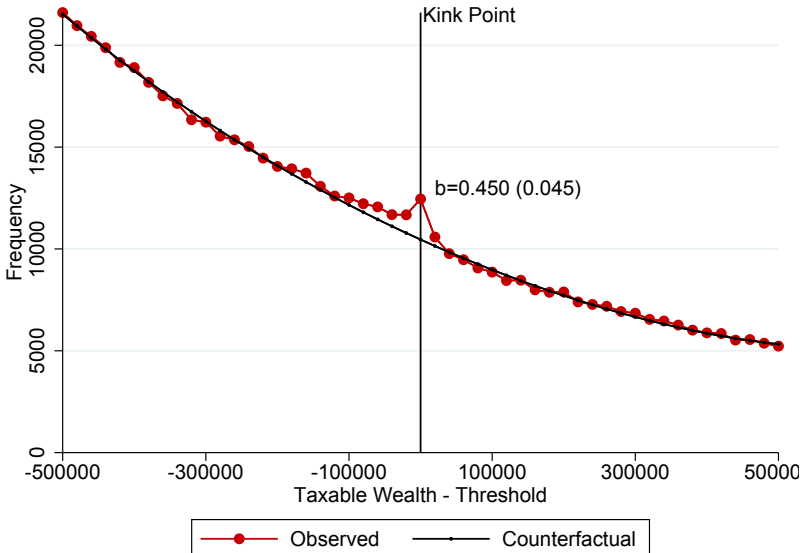
Bunching Before 1989-Reform



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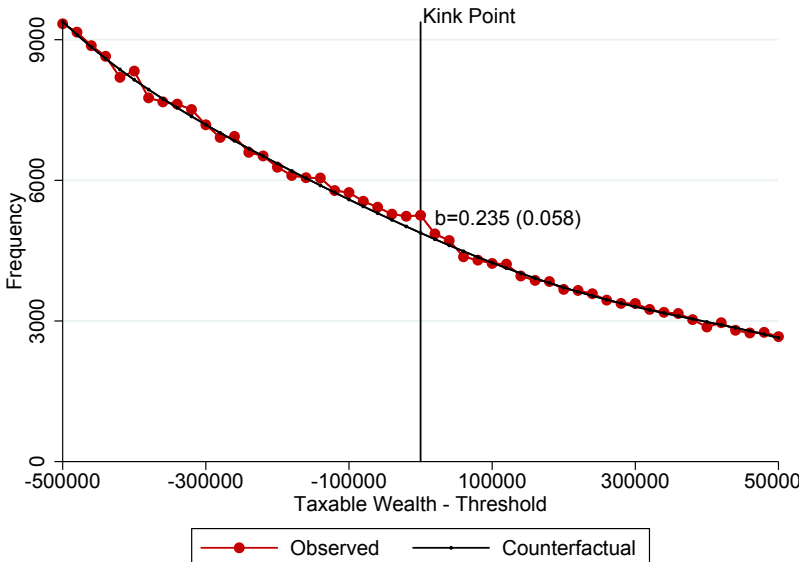
Bunching After 1989-Reform



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Couples DD Robustness to Treatment Window: 1980–88

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Couples DD Robustness to Treatment Window: 1984–88

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Couples DD Robustness to Treatment Window: 1986–88

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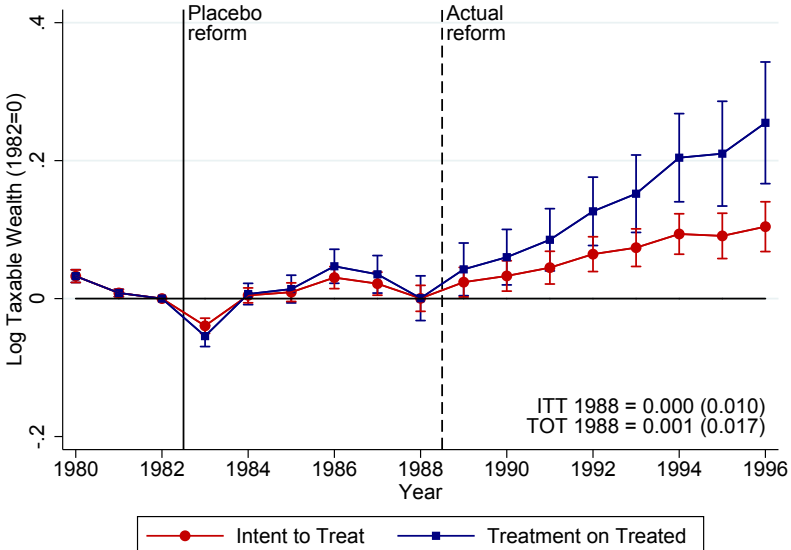
Couples DD: Placebo Reform 1983



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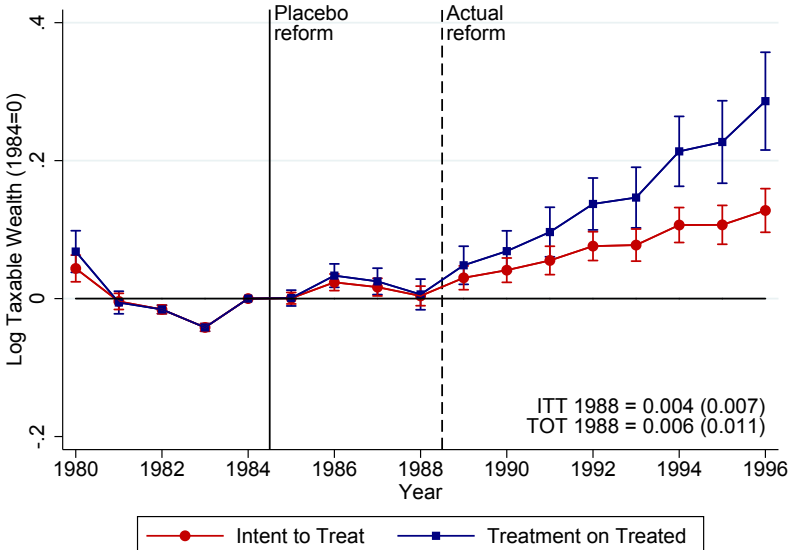
Couples DD: Placebo Reform 1985



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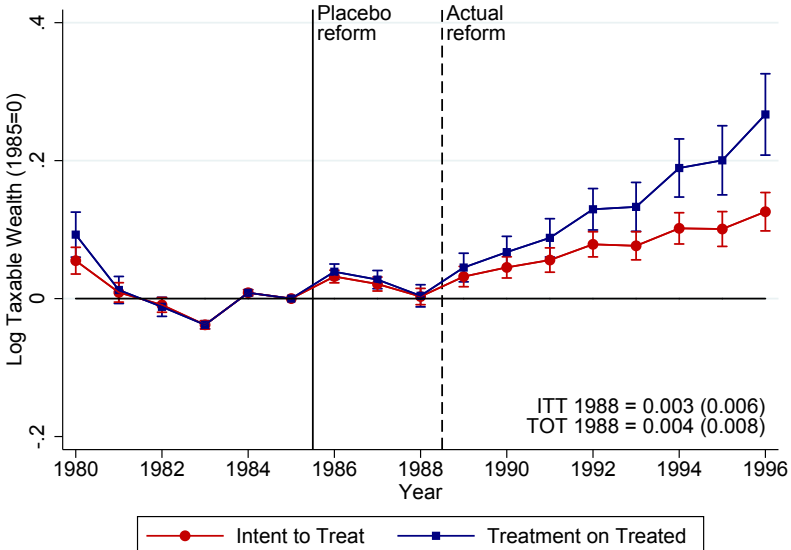
Couples DD: Placebo Reform 1986



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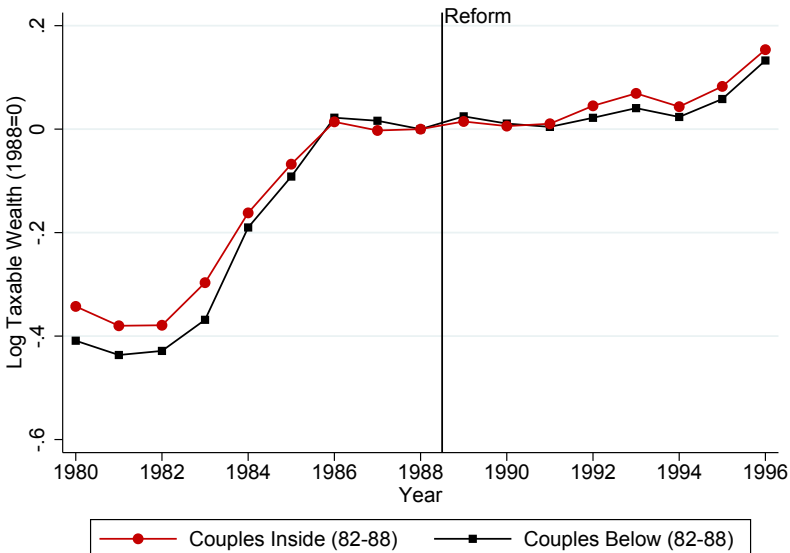
Comparing Couples Within Exemption Range to Couples Just Below



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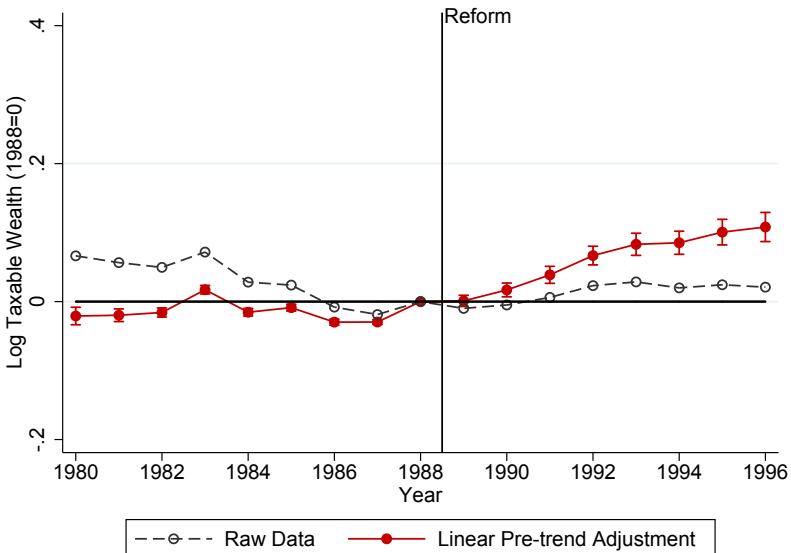

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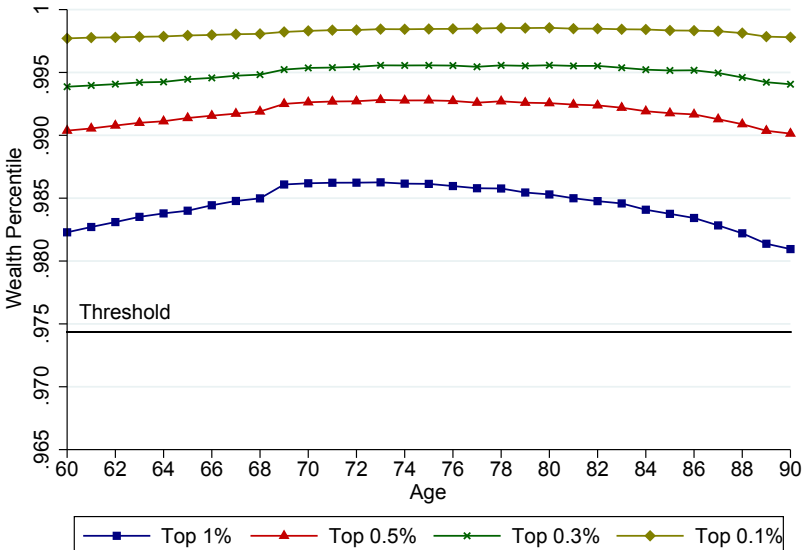
Wealth Profiles in Top Percentiles



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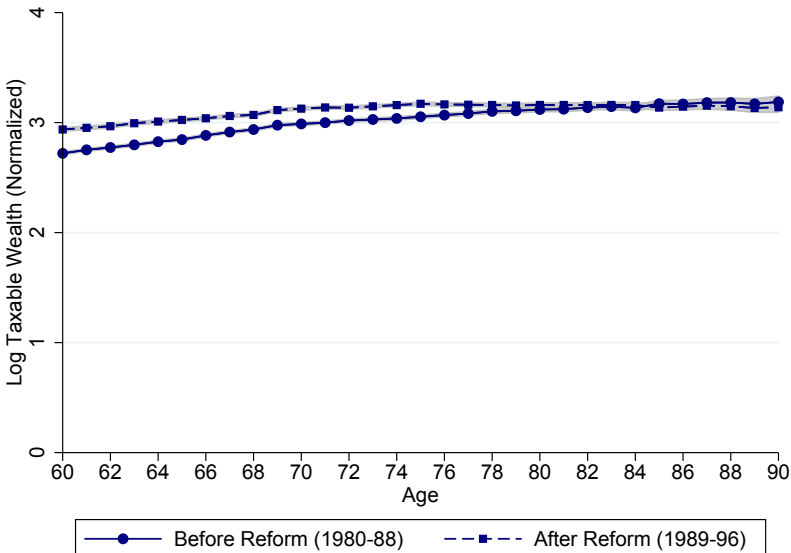
Wealth Profiles for the Top 1%: Before vs After Reform



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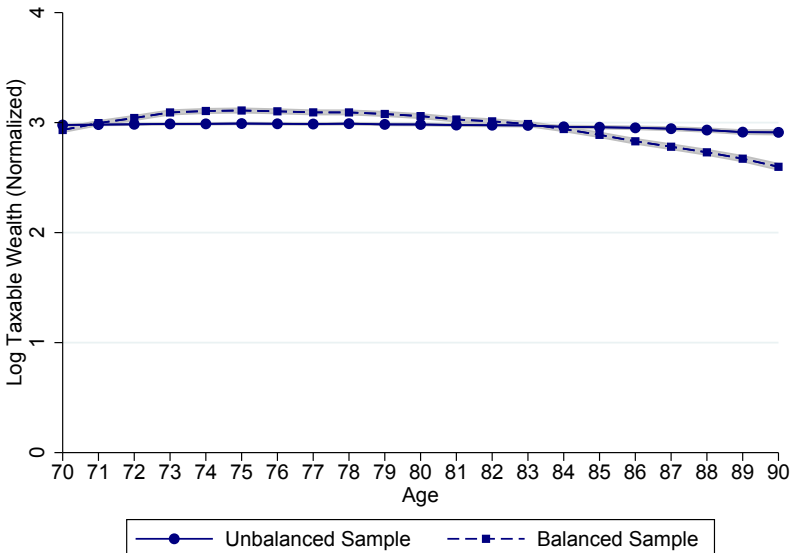
Wealth Profiles for the Top 1%: Balanced vs Unbalanced



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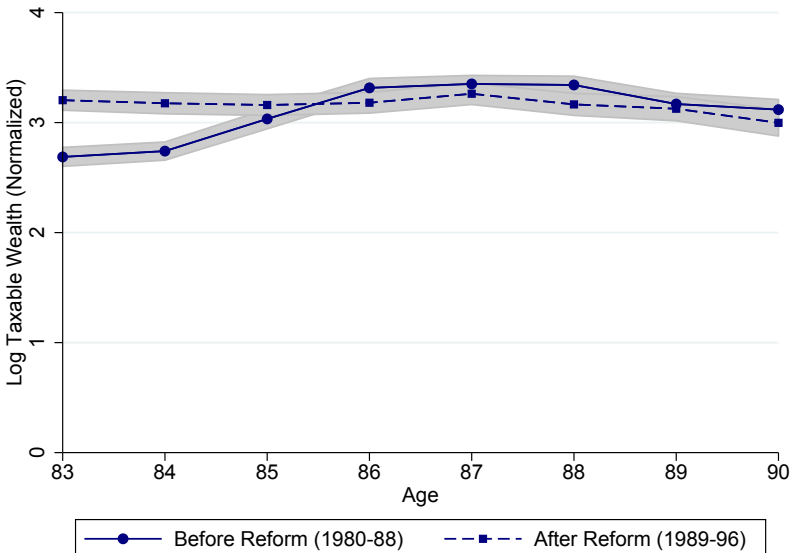
Wealth Profiles for the Top 1%: Before vs After Reform (Balanced)



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