

Saving Rate Heterogeneity under Wealth Rank Mobility

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1. Introduction

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Models of wealth inequality take the saving-wealth gradient as an input.

- A steeper saving-wealth gradient compounds top wealth faster and raises the top wealth shares: Benhabib et al. (2011), Gabaix et al. (2016), Achdou et al. (2022), Jones (2015)
- It also determines how much of wealth concentration is due to saving rates that rise with wealth rather than to bequests, entrepreneurship or returns: De Nardi (2004), Cagetti and De Nardi (2006), Hubmer et al. (2021)

1. Introduction

Under wealth rank mobility, each wealth decile has three saving rates.

- **The start group.** The households in the wealth decile at the start of a period
- **The end group.** The households in the wealth decile at its end
- **The immobile households.** The households in the wealth decile at both the start and the end

A saving rate is total saving, capital gains included, over lagged wealth. Repeated cross-sections cannot follow a household, so distributional national accounts divide the end group's flow by the start group's lagged wealth: the **synthetic rate**.

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Two results in the PSID, 2001 to 2023.

1. **The sign of the saving-wealth gradient depends on the group.** From the 61 to 70 wealth decile to the top it is -19.0 points ranked on start wealth, 1.8 among the immobile households and **9.8** ranked on end wealth

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Two results in the PSID, 2001 to 2023.

1. **The sign of the saving-wealth gradient depends on the group.** From the 61 to 70 wealth decile to the top it is -19.0 points ranked on start wealth, 1.8 among the immobile households and **9.8** ranked on end wealth
2. **The synthetic rate understates the top end group's saving rate by 63%.** The ratio of the end group's to the start group's mean lagged wealth corrects it exactly

1. Introduction

Two strands of literature.

- **Saving rates by group.** By wealth group on Nordic registers, Bach et al. (2018), Fagereng et al. (2025), and by permanent-income group on U.S. surveys, Dynan et al. (2004), Straub (2019)
- **Repeated cross-sections.** A group saving rate is valid only if the group holds the same households at both waves, Deaton (1985). The synthetic rate is in wide use: Saez and Zucman (2016), Kuhn et al. (2020), Blanchet and Martínez-Toledano (2023)
- **Wealth rank mobility and top wealth shares.** Gomez (2023), Blanchet (2022), Halvorsen et al. (2026)

2. Four saving rates and the synthetic bias

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Three saving rates of actual households, and one of no household.

Saving rate	Flow of	Over the lagged wealth of
End-group	the end group	the end group
Start-group	the start group	the start group
Immobile-group	the immobile households	the immobile households
Synthetic	the end group	the start group

Without wealth rank mobility the three groups coincide, and so do the four saving rates.

2. Four saving rates and the synthetic bias

The synthetic rate differs from the end-group rate only in its denominator.

$$\frac{1 + s_{\text{syn}}}{1 + s_E} = \frac{\beta_E}{\beta_S}$$

- s is a saving rate and β a group's mean lagged wealth
- The bias does not shrink as the sample grows
- At the top $\beta_E < \beta_S$, so the synthetic rate is too low

3. The four saving rates in the PSID

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The PSID matched panel, 2001 to 2023.

- Household net worth every two years. Reference persons aged 20 to 65, Survey Research Center core, 33,676 household-wave observations
- Wealth deciles cut on each wave's cross-section, the top and bottom one percent trimmed, saving rates annualized and unweighted
- The saving-wealth gradient is the top wealth decile's saving rate minus the 61 to 70 wealth decile's

3. The four saving rates in the PSID

The saving-wealth gradient is negative on start wealth and positive on end wealth.

Wealth decile	Start-group s_S^d (%)	Immobile-group s_I^d (%)	End-group s_E^d (%)	Synthetic s_{syn}^d (%)
41-50	55.5	7.1	1.8	5.0
51-60	29.1	7.2	2.8	4.5
61-70	21.6	6.1	5.6	4.3
71-80	15.2	5.9	7.8	4.0
81-90	11.9	7.1	9.4	4.6
91-100	2.6	7.9	15.4	5.7
Gradient, top minus 61-70	-19.0	1.8	9.8	1.4

3. The four saving rates in the PSID

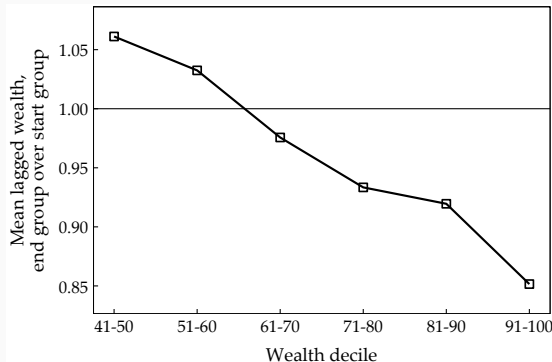
Upward and downward entrants carry most of the end-group gradient.

Wealth decile	End-group	Immobile households		Upward and downward entrants
	s_E^d (%)	s_I^{d*} (%)	weight (%)	contribution (pp)
41-50	1.8	7.6	31.9	-5.7
51-60	2.8	7.5	33.1	-4.7
61-70	5.6	6.1	37.5	-0.4
71-80	7.8	5.8	42.5	2.0
81-90	9.4	7.1	54.3	2.3
91-100	15.4	7.9	88.2	7.6

Upward entrants come from below the wealth decile, downward entrants from above. They account for **8.0** of the 9.8 points.

3. The four saving rates in the PSID

The synthetic rate understates the top end group's saving rate by 63%.



The synthetic rate is 5.7% and the end-group rate 15.4%. The gap is entirely the denominator: the end group's mean lagged wealth is 14.8% below the start group's.

3. The four saving rates in the PSID

At the top, the synthetic rate lies between the start and end groups.

Top wealth decile	Saving rate (%)
Start group	2.6
Synthetic	5.7
End group	15.4

- The synthetic rate takes its flow from the end group, its benchmark
- Saez and Zucman (2016) read it as the saving of the fractile's households
- That reading holds only without wealth rank mobility

3. The four saving rates in the PSID

Robustness checks

	Understatement at the top (%)
Baseline	63
Transitory noise removed	36
Net of capital gains	159
12 perturbations of sample and definitions	33 to 71
PSID family weight	61
Inverse retention weights	61
Equal-sized re-ranked wealth deciles	44
Two cross-sections instead of the panel	67

4. Conclusion

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- From the 61 to 70 wealth decile to the top, the saving-wealth gradient is -19.0 points ranked on start wealth, 1.8 among the immobile households and **9.8** ranked on end wealth. Upward and downward entrants account for 8.0 of the 9.8 points
- The three saving rates answer different questions. The end-group rate measures the saving of the currently wealthy, as in Mian et al. (2020). Random-growth models, as in Benhabib and Bisin (2018), need the start-group rate
- The synthetic rate is the saving rate of no group of households and understates the top end group's saving rate by **63%**. A larger sample does not reduce the bias. The ratio of the two groups' mean lagged wealth corrects it exactly

Thank you.

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Backup

The saving rate split by flow

The end-group rate splits exactly by flow.

The end group is $P_t^d = I^d \sqcup U^d \sqcup F^d$: the immobile households, the upward entrants and the downward entrants. With w_g^d the share of the end group's lagged wealth that type g holds,

$$s_E^d = s_I^d + \sum_{g \neq I} w_g^d (s_g^d - s_I^d).$$

- In the PSID the upward entrants into the top wealth decile had low lagged wealth and fast wealth growth, so they raise the top end-group rate above the immobile-group rate
- The exiters from the top wealth decile saved less than its immobile households, so they lower the top start-group rate. At the bottom the directions reverse

The mean-preserving spread of the denominators

The synthetic denominators are a mean-preserving spread.

$$\sum_{d=1}^k \beta_S^d \leq \sum_{d=1}^k \beta_E^d, \quad k = 1, \dots, D, \quad \text{with equality at } k = D$$

- The start groups hold less lagged wealth than the end groups at the bottom of the wealth distribution and more at the top, with the two totals equal
- The proof is a rearrangement inequality over the cumulative sums, Hardy, Littlewood and Pólya (1952)

Equal-sized re-ranked wealth deciles

Re-ranked into equal-sized wealth deciles, the synthetic method reverses the sign.

- Re-ranked within the matched panel, the understatement of the top end group's saving rate is 44%
- From the 61 to 70 wealth decile to the top, the end-group gradient is 9.9 percentage points and the synthetic gradient -5.7

The top wealth percentile on the Saez and Zucman numerator

On active saving, the synthetic rate reverses the sign at the top wealth percentile.

- Saez and Zucman (2016) use a synthetic saving rate whose numerator is active saving, net of capital gains
- On that numerator the synthetic rate is -4.4% at the top wealth percentile and the end-group rate 3.2% . The same reversal holds at the top five percent
- The top wealth percentile holds 325 PSID households

The forward-ranking test

Ranked on the next wave's wealth, the end-group gradient is near zero.

- The end group is selected on recorded end wealth, which also enters its flow, so noise in recorded wealth can raise its saving rate
- On the 23,957 household-waves observed in three consecutive waves, ranking on the following wave's wealth puts the top end-group rate at 12.6% against 15.9%, and the end-group gradient at 0.4 against 8.8. It is not distinguishable from zero
- Households also change wealth decile between the two waves, so the fall overstates the noise in the end-group gradient