Why are the Wealthiest So Wealthy?
A Longitudinal Empirical Investigation

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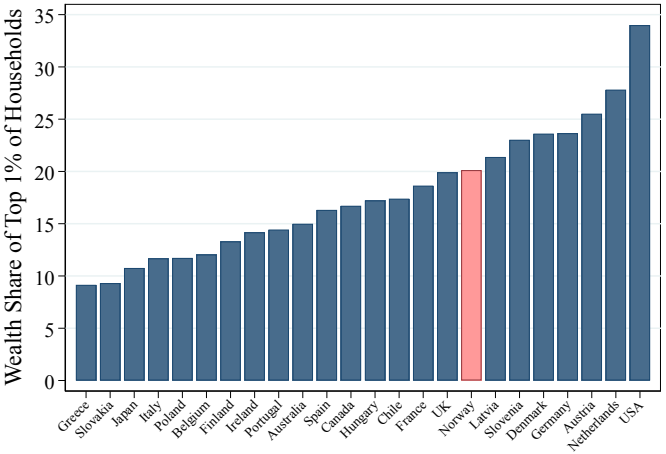
Introduction

Wealth is concentrated at the top in many countries



Source: OECD and SCF for the United States.

- Wealth is very concentrated at the top
  (Piketty, 2014; Saez and Zucman, 2016; Bricker et al., 2018; Smith et al. 2020)
- Started debate if/how tax wealth
  (Guvenen et al. 2021, Boar-Midrigan, 2022)
- Critically, policy depends on economic forces behind wealth accumulation

Why are the wealthiest so wealthy?

- **Inheritance heterogeneity:** receive larger inheritances and intervivos transfers
  (Kotlikoff and Summers 1981; Gale and Scholz, 1994, De Nardi, et al., 2015; Boserup et al. 2016)
- **Rate of return heterogeneity:** large and/or persistent heterogeneity in returns to wealth
  (Quadrini 2000; Cagetti and De Nardi, 2006; Bach et al., 2020; Fagereng et al., 2020; Benhabib et al, 2019)
- **Saving rate heterogeneity:** Rich households are thrifty?
  (Fagereng, et al., 2022; Bach et al., 2017)

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Earlier literature studied forces separately using **cross-sectional** data and/or calibrated quantitative models
(Exceptions: Fagereng et al., 2020, 2021, 2022; Black et al., 2021; Bach et al., 2020)

- Cross-sectional data tells us *who* is rich but not *how they became* rich
- Data on **dynamics** of wealth accumulation help to quantify importance of these mechanisms

Data and Definitions

Norwegian Administrative Data

High quality, administrative panel data for entire population of Norway from 1993 to 2015 on ▸ More

- Wealth (e.g., housing, priv. business, stocks) and income sources (e.g., labor, cap. gains, bequests)
- Long panel allows following individuals for 23 yrs. including those at the top of the distribution
- Linked parents/children: inheritances, business ownership, and wealth/returns across generations

Limitations

- Excludes pension wealth and "hidden" offshore wealth

  >80% of pension is PAYG, 18% plans by employers, ~ 0.3% is personal pension; For the top 0.1%, this can be around ~20%

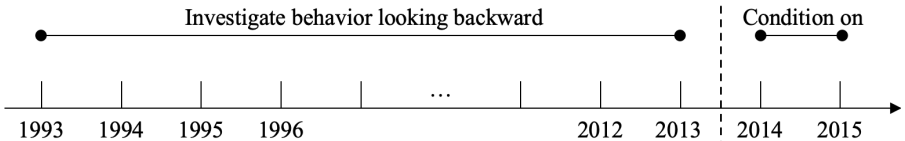
- Self-assessed value of private business based on balance sheet (large firms are audited regularly)

  Intangible capital and residual goodwill are missing

▸ Sample ▸ Stats Norway ▸ Shares Norway ▸ Stats USA ▸ Shares USA ▸ Tax ▸ Cross Sectional Profiles

The Dynamics of Wealth Accumulation

Backward-looking approach: From where did the rich come from?



- Rank households by average net wealth in 2014-15 within 5-year age groups
  - Wealth groups: (i) top 0.1%, (ii) P99.9/P99, (iii) P99/P95, etc.
- Follow groups of households *backward* for 22 years over 1993–2015 period
  - Compute moments of wealth distribution, portfolio composition, returns, etc.

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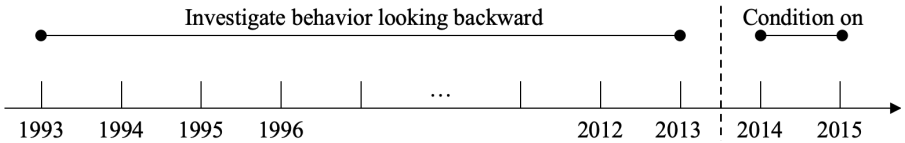

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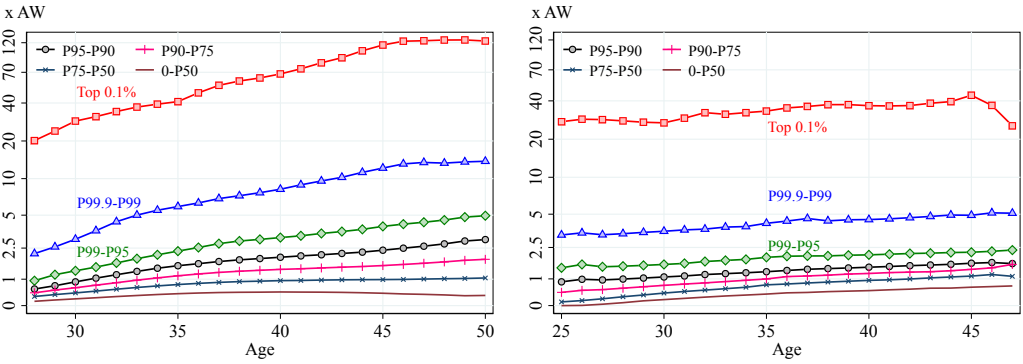
- Follow groups of households *backward* for 22 years over 1993–2015 period
  - Compute moments of wealth distribution, portfolio composition, returns, etc.
- Limitations: selecting on endogenous variable (survival bias) and cohort effects
  - Complement with **forward-looking approach (in the paper)**
  - Compute average moments for different conditioning years (i.e., 2014 to 2009)

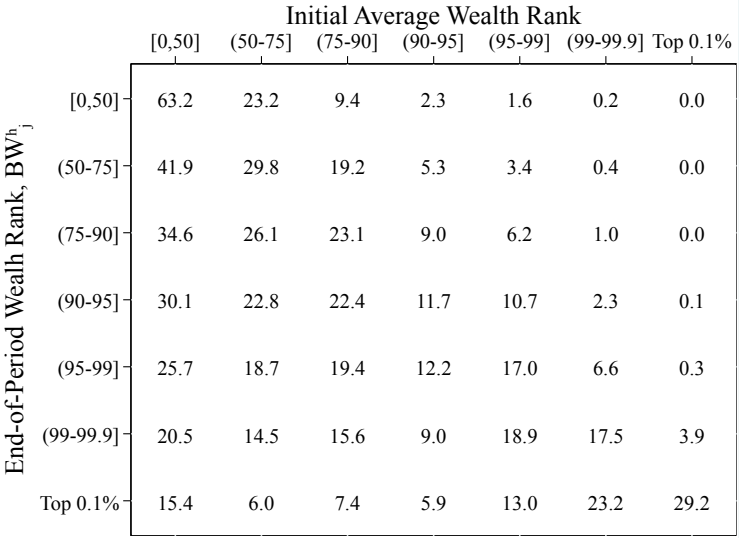
Dynamic Average Wealth Profiles



(a) Backward-looking **(b)** Forward-looking

- **Large dispersion at age ~25:** top 0.1% own ~20 × AW the average wealth ‣ Age
- **No convergence:** Top wealth inequality remains constant over lifecycle

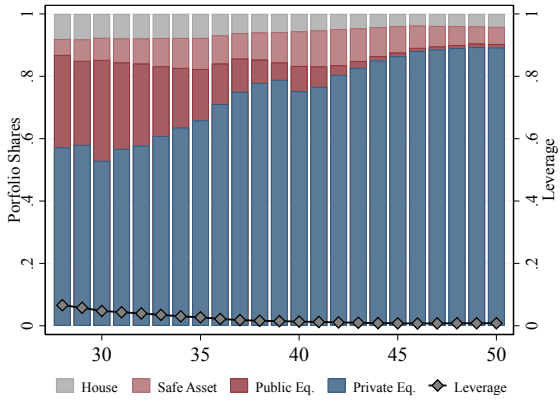
21-Year Retrospective Transition Matrix for 50-Years Households



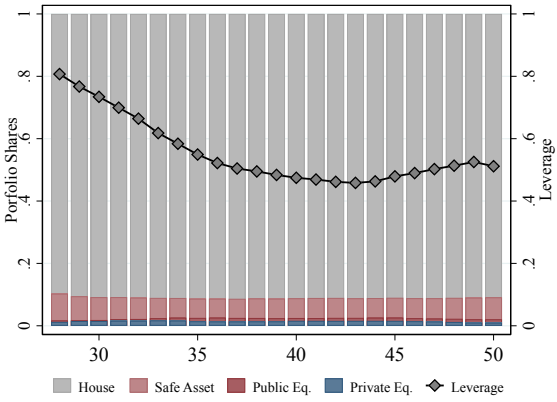
End-of-Period Wealth Rank, BW^h_j	Initial Average Wealth Rank [0,50]	(50-75]	(75-90]	(90-95]	(95-99]	(99-99.9]	Top 0.1%
[0,50]	63.2	23.2	9.4	2.3	1.6	0.2	0.0
(50-75]	41.9	29.8	19.2	5.3	3.4	0.4	0.0
(75-90]	34.6	26.1	23.1	9.0	6.2	1.0	0.0
(90-95]	30.1	22.8	22.4	11.7	10.7	2.3	0.1
(95-99]	25.7	18.7	19.4	12.2	17.0	6.6	0.3
(99-99.9]	20.5	14.5	15.6	9.0	18.9	17.5	3.9
Top 0.1%	15.4	6.0	7.4	5.9	13.0	23.2	29.2

- Old Money: Around half of the top 0.1% in 1993 are still in the top 1% in 2015. ▸ Age
- New Money: 20% the top 0.1% in 2015 came from below 75% in 1993. ▸ Forward

Retrospective portfolio shares for 50-year olds



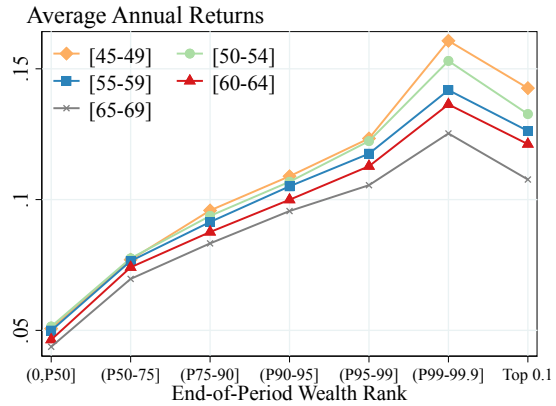
(a) Households at top 0.1%

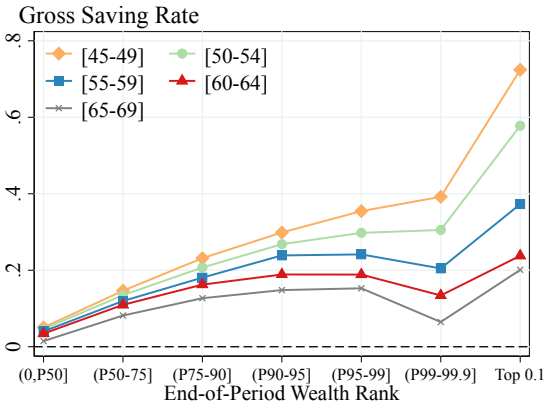


(b) Households at bottom 50%

- Rich have private equity share; low-mid wealth have mostly housing
- Rich: almost constant share of risky assets of ~85%; Similar for other age groups ‣ Age

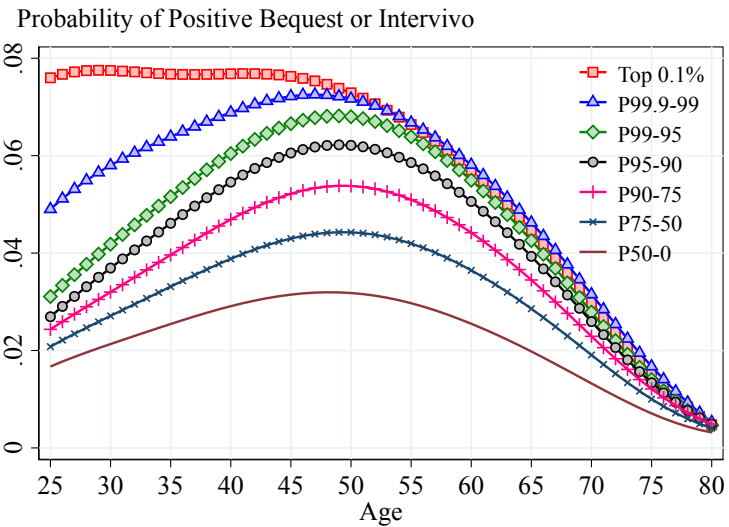
The Rich have higher Lifetime Returns and Saving Rate





- **Higher Returns** coming from higher returns on equity
- **Higher Saving Rate** which declines with age

The Rich receive inheritances more often and earlier in life



Wealthy: Higher probability of inheritances and intervivo earlier in the life cycle

Most coming from intervivo transfer

Middle and low wealth:
Probability of inheritances + intervivos is hump-shaped

Shapley-Owen Decomposition of contributions

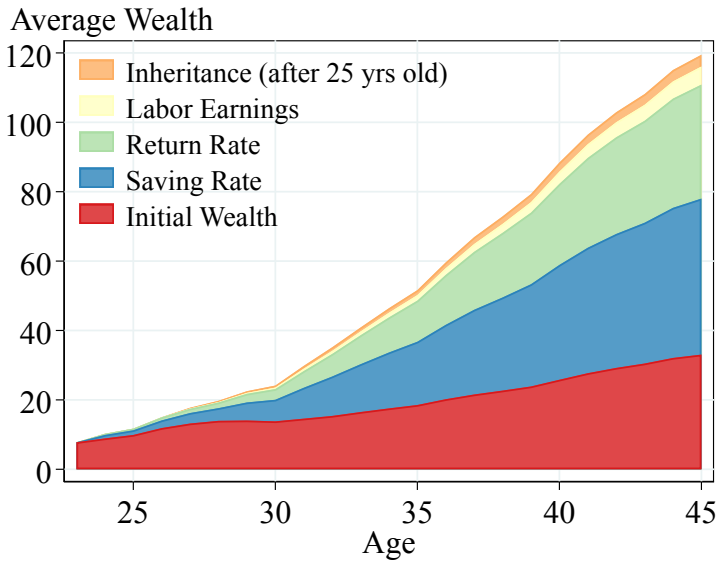
We use **panel data** between 1993 and 2015 on wealth and income from Norway to

- **Empirically** shed light on the roles of main drivers of wealth accumulation for the rich
- We observe each term in the budget constraint in our data:

$$W_t = W_{t-1} + (L_t + H_t + R_t \times W_{t-1}) \times S_t,$$

  - W_t: Net worth in age t
  - L_t: After-tax after-transfer labor income
  - H_t: Inheritances and inter-vivos transfers (net of taxes)
  - R_t: Rate of return on net worth (net of taxes)
  - S_t: Saving rate
- Simulate counterfactual wealth profiles by replacing each component with a counterfactual value.
  - e.g., what would be the wealth of the top 0.1% if they had e.g., *the saving rate* of mid-wealth hh's?
- Shapley-Owen decomposition: consider all possible permutations of counterfactual wealth profiles
  - measure average marginal contribution of each factor.

How Have the Top 0.1% Accumulated their Wealth?



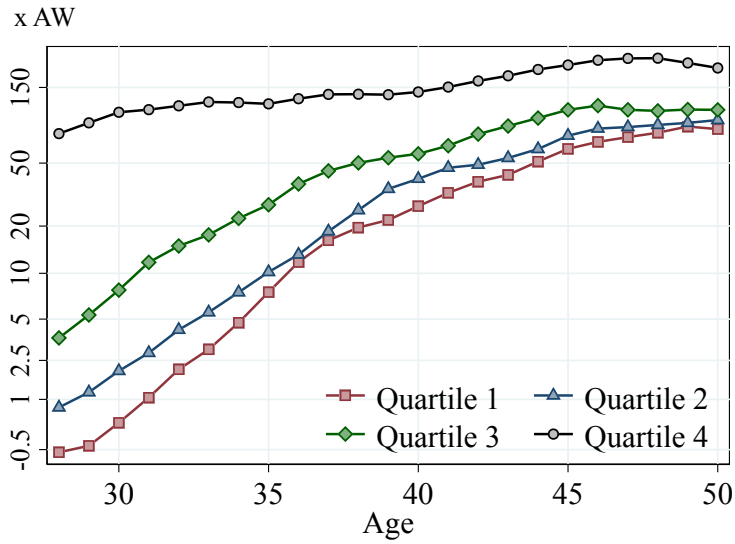
Wealth gap between top 0.1% and median hhs driven by

- Saving rate → 34%
- Initial Wealth → 32%
- Rate of returns → 27%
- Labor income → 5%
- Inheritance →1%

▸ One-by-one ▸ Age

“Old Money” versus “New Money”

Old Money vs. New Money in Top 0.1%: Wealth Profiles

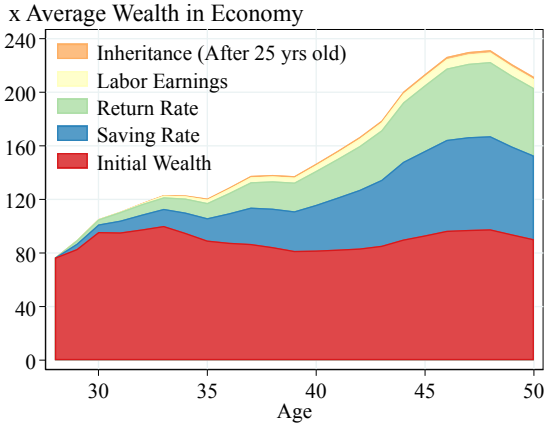


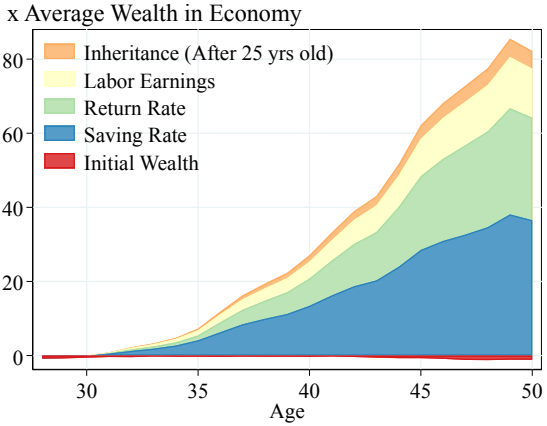
Wealth profile for top 0.1% at age 50 by initial wealth quartile (1993)

"New-Money" (Q1) significant wealth growth, start with high leverage (-1/2 of mean wealth)

▸ Forward

Not all Rich are Created Equal: Old and New Money





- **Old Money**: initial wealth even more important. **New Money**: high saving rates and returns
- State-of-the-art calibrations do not account for New Money (e.g., Hubmer et al. 2020, Guvenen et al. 2022)

▸ Portfolio ▸ Returns

Conclusions

Those end up at the top of the wealth distribution, on average, ...

- Started wealthy, experience high returns, and have high saving rate over their lifetime

Not all rich are created equal.

- Old Money: start with significant wealth and save large fraction of resources
- New Money: accumulate wealth on private equity, high returns, and saving rate

Implications for quantitative models of wealth inequality

- Our analysis ignores behavioral responses
- Saving rate heterogeneity as important as returns and initial wealth heterogeneity
- **Current work on quantitative model** → entrepreneurs model with non-homothetic preferences

Current Work on Quantitative Model

Study drivers of top wealth accumulation

- OLG model of entrepreneurs
- Estimated using new data on lifecycle wealth dynamics (wealth accumulation, returns, saving rate,...)

What do we learn from the quantitative decomposition?

- Non homothetic pref. crucial for matching saving rate-wealth relation and amplify heterogeneity
- Earlier inheritances crucial for accounting for wealth of the Old Money

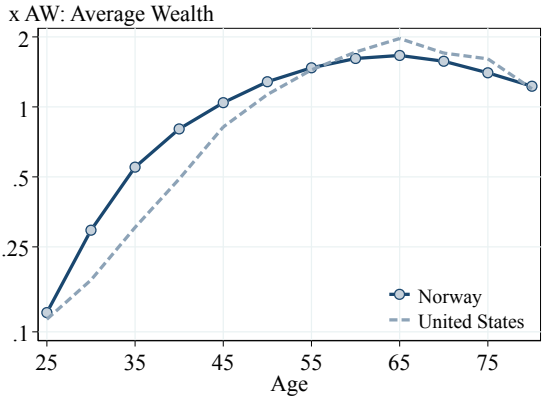
In progress: New insights about wealth and bequests taxation

- Efficiency: decreasing returns + financial frictions a more equitable distribution of initial wealth
- Intergenerational correlation: high inheritance in data associated to high types
- Answer depend the share of Old Money and New Money

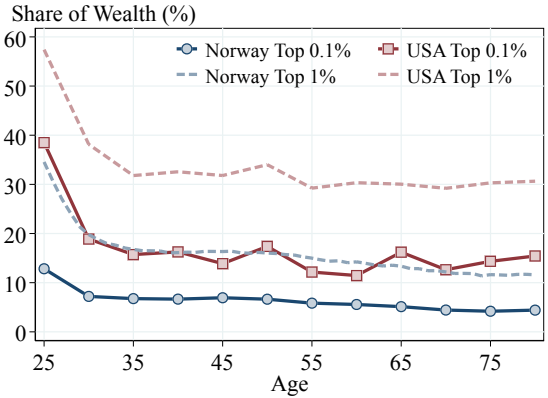
Appendix

Cross-Sectional View: Average wealth and concentration over the lifecycle

Back



(a) Average Wealth Profile



(b) Wealth Concentration

Average wealth hump-shaped (↑from 0.12 to 1.7 mean wealth). Inequality decreases over lifecycle

Stats Norway · Shares Norway · Stats USA · Shares USA · Tax · Portfolio-Wealth

Sample selection

Back

- Measure all variables at the household level
  - Natural decision-making unit → wealth taxed at the households level
- Include individuals ≥25 years-old with non-missing wealth
- Total sample of ~51.1 million hhs-year obs with an average of ~2.2 million hhs per year

Norway: Concentration of Wealth and Income Shares

Back

	Bottom 50	Top 10%	Top 5%	Top 1%	Top 0.1%	Top 0.01%
Labor Earnings	8.15	32.72	19.44	5.77	1.13	0.25
Safe Assets	4.14	59.32	44.01	21.12	7.73	2.69
Public Equity	0	99.89	99.19	86.64	53.71	27.87
Private Equity	0	91.03	80.85	55.55	29.49	15.91
Housing	12.52	35.95	23.47	8.53	2.11	0.60
Gross Wealth	13.22	38.43	26.56	11.81	4.44	1.87
Debt	5.09	39.26	23.64	7.01	0.87	0.16
Net wealth	7.31	43.81	30.73	14.10	5.46	2.33

Notes: Wealth and income shares. We first calculate cross sectional moments at the annual level and then we average the statistics across all years in the sample (1993 to 2015).

United States: Sample Statistics from SCF

Back

Descriptive Statistics (US$ of 2018)							
	Mean	SD	P10	P50	P90	P99	P99.9
Safe Assets	125,615	602,358	85	16,521	281,479	1,620,551	5,924,482
Public Equity	84,644	1,109,028	0	0	76,413	1,569,328	9,102,842
Private Equity	91,180	1,825,445	0	0	7,301	1,574,025	12,985,575
Housing	237,051	1,477,831	0	98,010	457,038	2,389,650	10,598,920
Gross Wealth	538,491	3,293,036	382	143,885	938,809	7,116,825	31,126,536
Debt	78,513	532,779	-2	12,596	194,056	694,872	2,637,272
Net wealth	459,978	3,113,103	-1,741	78,847	801,826	6,685,830	27,845,214

Notes: Descriptive statistics of wealth and income in the United States using SCF. We first calculate cross sectional moments at the annual level and then we average the statistics across all years in the sample (1992 to 2016).

United States: Concentration of Wealth and Income Shares

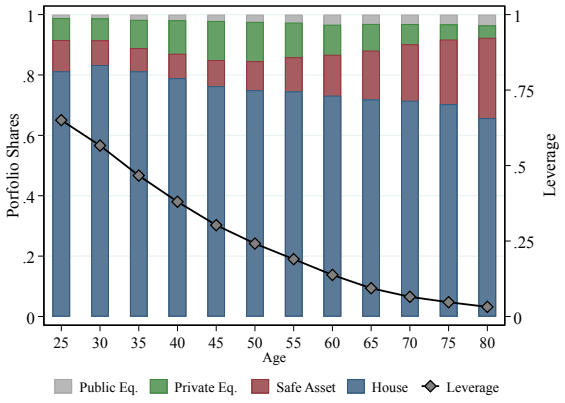
Back

	Bottom 50	Top 10%	Top 5%	Top 1%	Top 0.1%	Top 0.01%
Income	9.41	49.92	38.58	21.42	8.32	3.03
Safe Assets	1.60	70.35	55.24	28.46	9.16	2.89
Public Equity	-0.04	95.77	87.27	59.96	25.47	8.90
Private Equity	-0.01	99.95	97.48	77.97	36.47	13.67
Housing	4.77	59.39	47.08	26.87	11.17	4.87
Gross Wealth	3.86	68.31	56.79	33.12	12.06	3.88
Debt	-0.08	58.84	43.93	23.31	10.95	5.59
Net wealth	1.78	73.37	61.55	36.24	13.28	4.33

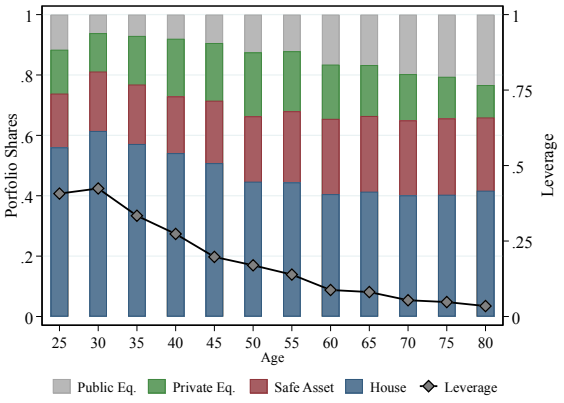
Notes: Wealth and income shares. We first calculate cross sectional moments at the annual level and then we average the statistics across all years in the sample (1992 to 2016).

Cross-Sectional View: Life Cycle Portfolio

Back



(a) Norway



(b) United States (SCF)

Norway and US differ in share of public equity; Similar decrease of housing and leverage over lifecycle

Wealth Tax System in Norway

▸ Back Data

Wealth Tax is taxed at 0.7% at municipality level and 0.15% at national level

- The tax applies to the value of wealth above NOK 1.2 million (140,000 USD) for single/not married taxpayers and NOK 2.4 million (280,000 USD) for married couples
- Hence, wealth tax kicks-in around the 55th percentile of the wealth distribution for individuals and households
- Capital income taxes have been flat at 28% from 1992-2012, thereafter gradually reduced to 22% today

Wealth Tax over time

- In 1994 tax was more progressive (max rate of 1.5%) with much lower threshold (NOK 120,000/$15,000 USD)
- The threshold has been adjusted up mainly in the last 10 years, together with a reduction in tax rates
- Different asset classes had varying degrees of rebates; Housing has always been taxed at 25% of its value

Inheritance Tax: Abolished in 2014

- Before abolition, inheritance and gift tax had a zero rate below NOK 470,000/$56,000 USD
- After that, rates were 6% to 15% depending on status of beneficiary and amount

Income Tax System in Norway

Back

Dual income tax system

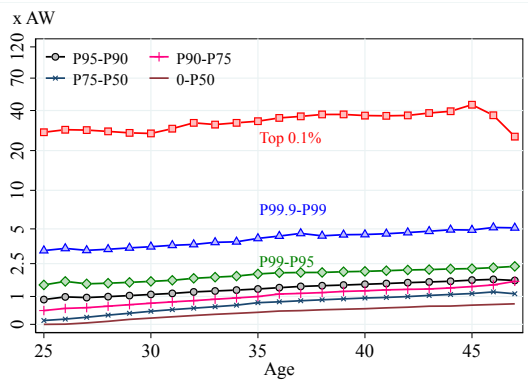
- Proportional tax on all net income (23% in 2018)
  - Includes wages, pension, business, capital income less losses and interest paid.
  - Is split between local, regional, and central governments
- Progressive tax on gross labour and pension income
  - Starting at 174 000 NOK, rates from 1.9% to 16.2%
- 2 main deduction applied: Minimum standard deduction, Personal allowance

Shareholder model

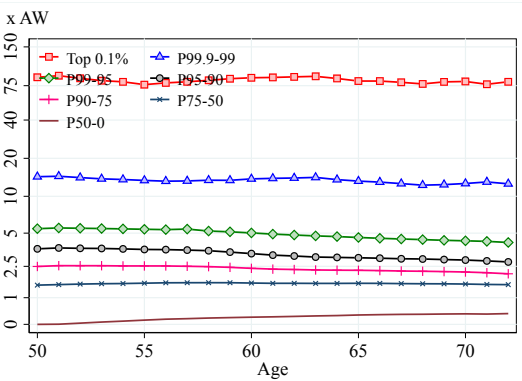
- Dividends exceeding the risk-free rate are taxed as ordinary income
- The remainder is only taxed at the corporate tax rate (23%) with a marginal tax rate of (46.6%)

Forward-Looking Wealth Profiles: Age Groups

Back



(a) Forward-Looking Profile (26/30)

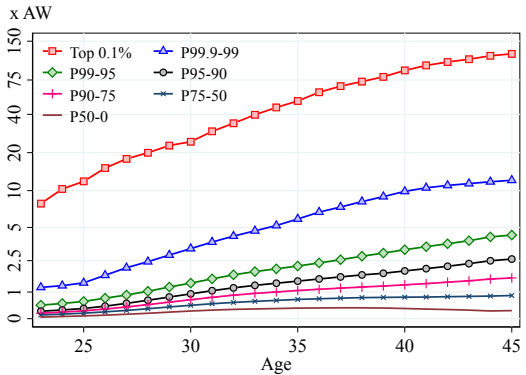


(b) Forward-Looking Profile (46/50)

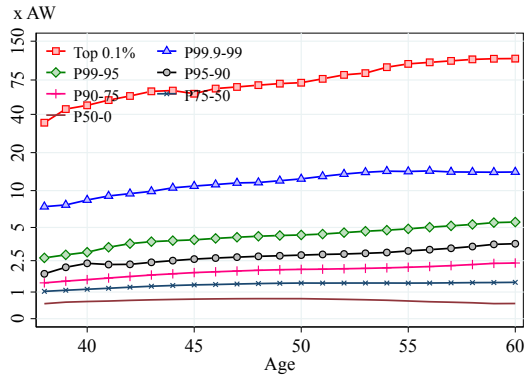
- Forward-looking wealth profiles show similar persistence

Backward-Looking Wealth Profiles: Age Groups

Back



(a) Forward-Looking Profile (40/45)

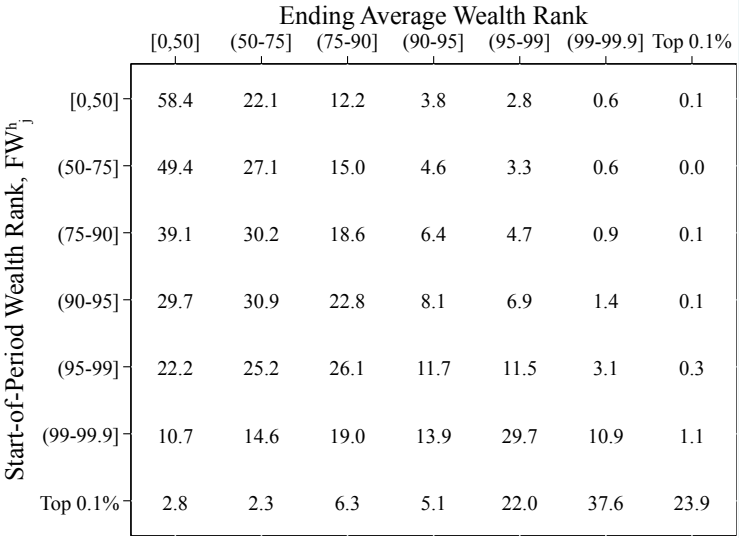


(b) Forward-Looking Profile (61/65)

- Backward looking profiles for other age groups. Persistency increases for older age groups

21-Year Forward-Looking Transition Matrix for 25-Year Olds

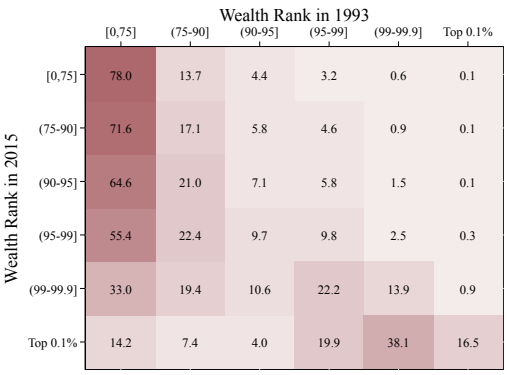
Back



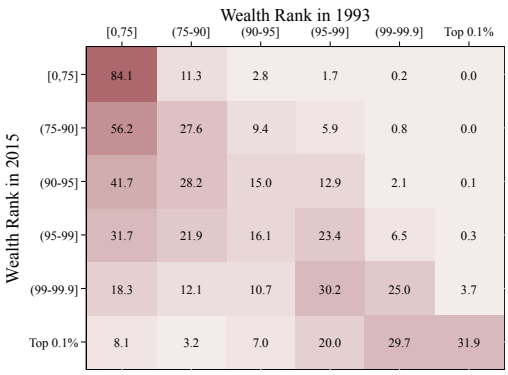
- Old Money: More than half of the top 0.1% in 1993 are still in the top 1% in 2015.

21-Year Retrospective Transition Matrix: Age

Back



(a) Retrospective Transition Matrix (41/45)

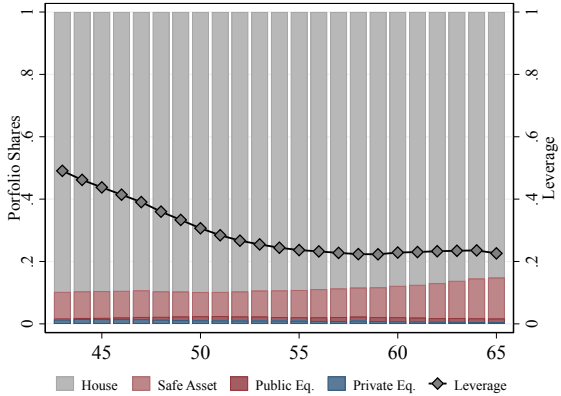


(b) Retrospective Transition Matrix (61/65)

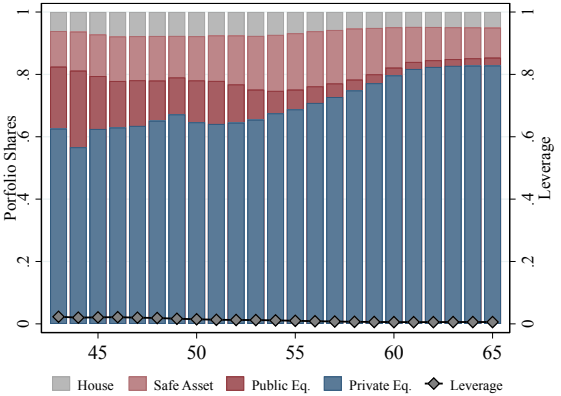
- Persistence increases as the cohort ages

Retrospective portfolio shares for 65-year olds

Back



(a) Households at bottom 50%



(b) Households at top 0.1%

- Rich have high and increasing private equity share; low-mid wealth have mostly housing
- Rich: almost constant share of risky assets of ~85%; Similar for other age groups

Calculation of Returns on Assets

Back

We follow Fagereng et al. (2020) and calculate returns on assets as

$$r_{it}^{n} = \frac{y_{it}^{s} + y_{it}^{e} + y_{it}^{h} - y_{it}^{b}}{w_{it}^{g} + F_{it}^{g}/2},$$

- y_{it}^{s}, y_{it}^{e}, and y_{it}^{h} are income from financial assets (e.g. bonds), equity (e.g. stock and private equity), and housing
- y_{it}^{b} is the sum of interest paid in all forms of debt
- w_{it}^{g} is the stock of wealth at the beginning of the period
- F_{it}^{g} is net flows of gross wealth during period (assets yields happens during year and hhs add/subtract from assets)

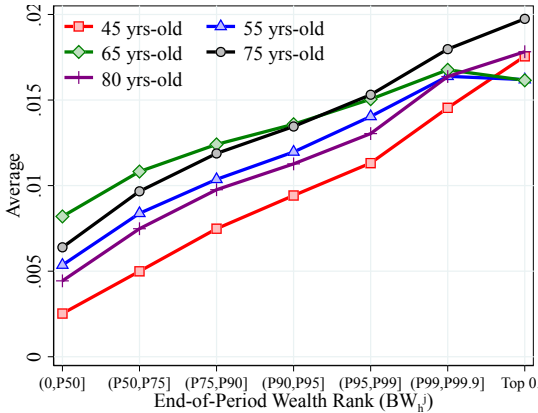
We calculate similar returns for safe assets, equity, and housing, which income flows are calculated as follows

- y_{it}^{s}: interest income
- y_{it}^{e}: dividend income + capital gains from stock + capital gains from stocks
- y_{it}^{h}: income from non occupied house + capital gains from housing

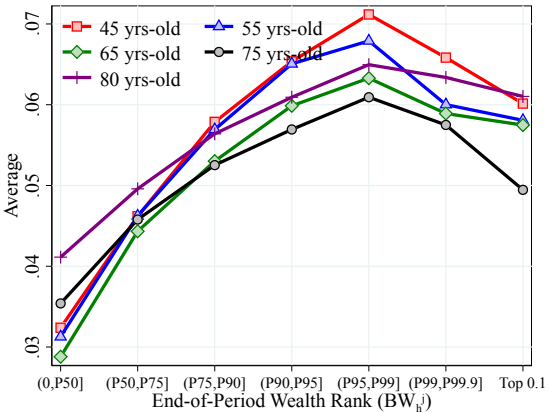
We calculate returns for household with assets above \$500 USD and trim top/bottom 0.5% in each year

Lifetime Returns on Assets Across the Wealth Distribution

Back



(a) Returns on Safe Assets

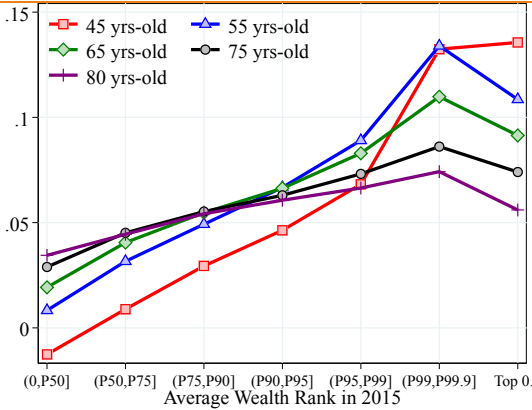


(b) Returns on Housing

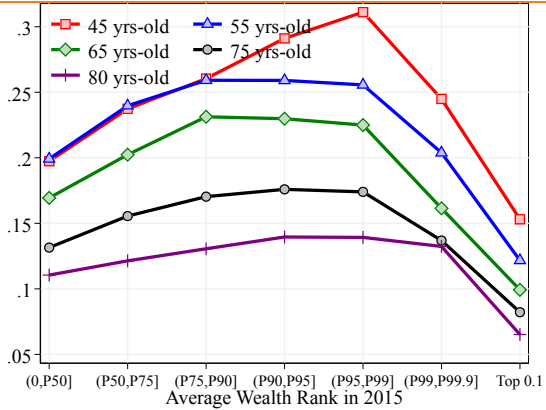
- Calculate returns on assets (Fagereng et al., 2020) and calculate 12 yrs average Details
- Rich households experience higher returns on safe assets and housing

Long: Lifetime returns on assets across the wealth distribution

Back



(a) Returns on Net Wealth



(b) Returns on Equity

- We impute capital gains prior 2005 and Imputed returns using equity-shares
- Find similar results

Fundamental lifetime: Details

Back

- Assumption: individuals invest additional resources in the same proportions observed in their portfolio allocation.
- Consider a household i that starts 1994 with 1993 wealth ($W_{i,1993}$) and then receives income $L_{i,1994}, H_{i,1994}, T_{i,1994}$
- Then, for the year 1994 the accumulated stocks of these components equal to their value in this year; i.e., $\hat{W}_i^{94} = W_i^{93}$, $\hat{L}_i^{94} = L_{i,1994}$, $\hat{H}_i^{94} = H_{i,1994}$, $\hat{T}_i^{94} = T_{i,1994}$.
- During the same year household i also earns net capital income ($RK_{i,1994} + CG_{i,1994} - LB_{i,1994}$). We then distribute the net capital income between these resources according to their share out of total resources

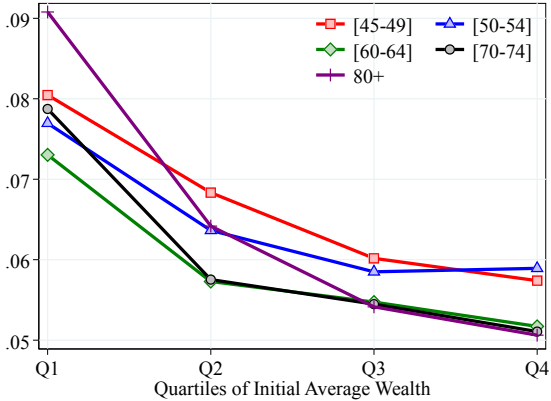
$$\left(RK_{i,1994} + CG_{i,1994} - LB_{i,1994}\right) \frac{\hat{X}_i^{94}}{\left(\hat{W}_i^{94} + \hat{L}_i^{94} + \hat{H}_i^{94} + \hat{T}_i^{94}\right)},$$

where X denotes the resource type. Then, next year, in 1995, the stock value of wealth from 1993 will be equal to

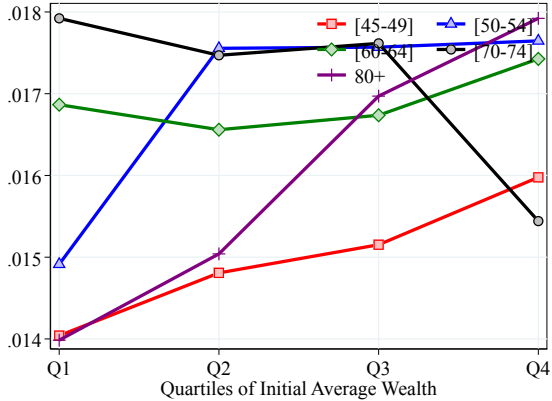
$$\hat{W}_i^{95} = \hat{W}_i^{94} + \left(RK_{i,1994} + CG_{i,1994} - LB_{i,1994}\right) \frac{\hat{W}_i^{94}}{\left(\hat{W}_i^{94} + \hat{L}_i^{94} + \hat{H}_i^{94} + \hat{T}_i^{94}\right)}$$

Lifetime Returns on Assets Across the Wealth Distribution

Back



(a) Returns on Households

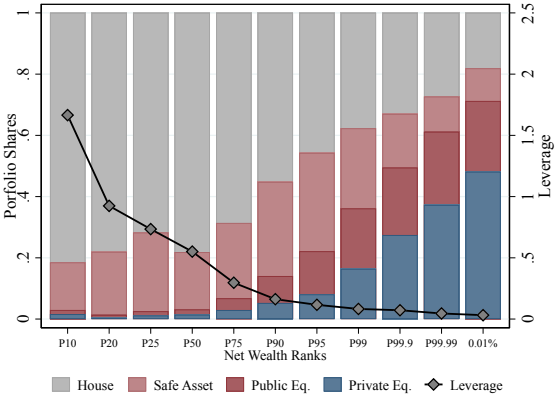


(b) Returns on Safe

Cross-Sectional View: Portfolio Composition

Back

(a) Norway

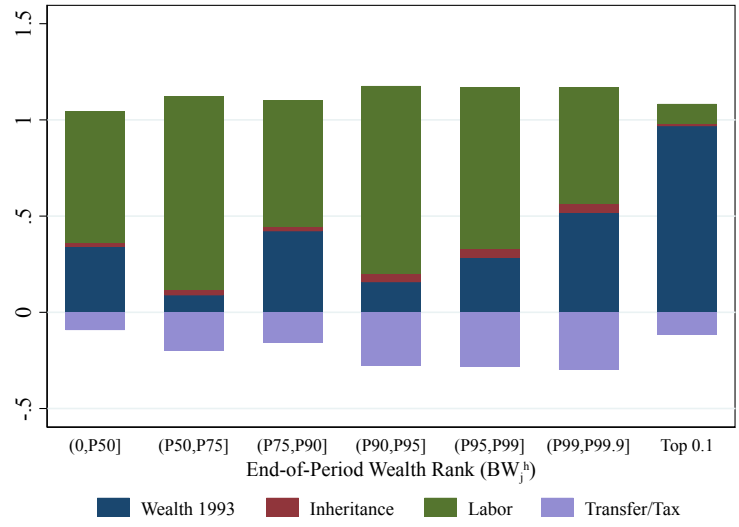


(b) United States (SCF)

- Large fraction of equity at the top: ~90% in Norway and ~70% in the United States

Fundamental lifetime resources for 50-year olds

Back



Distribute capital income to

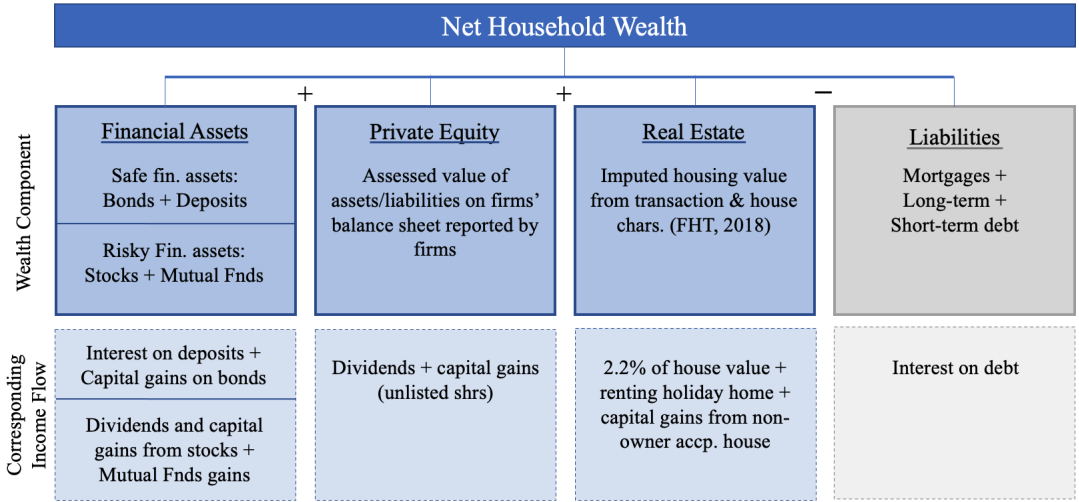
- Wealth in 1993
- Inheritances/intervivos
- Labor income
- Net transfers

Assumption: hhs invest these according to portfolio shares

For the wealthiest single most important component is initial wealth Details

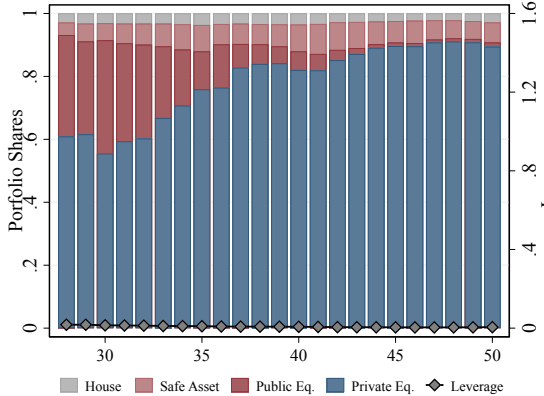
Wealth and income measures

Back

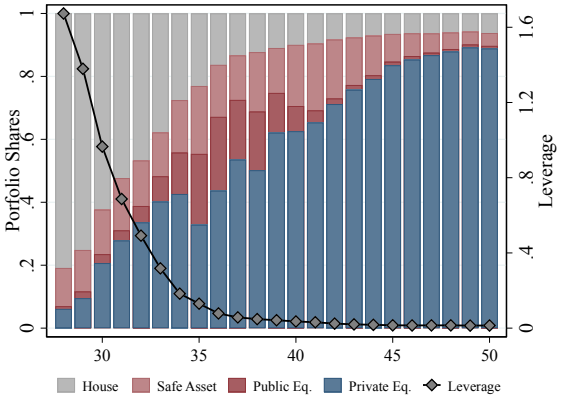


Old Money vs. New Money: Portfolio Shares

▸ Back



(a) Old Money (Q4)

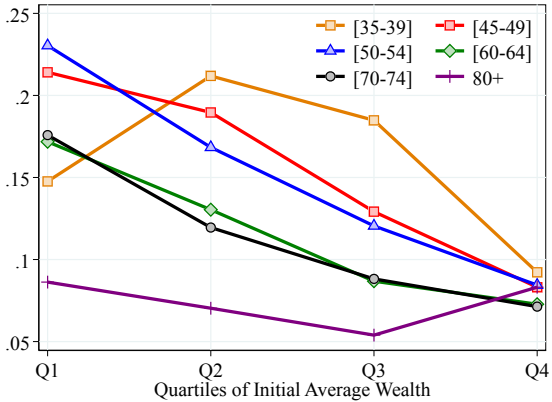


(b) New Money (Q1)

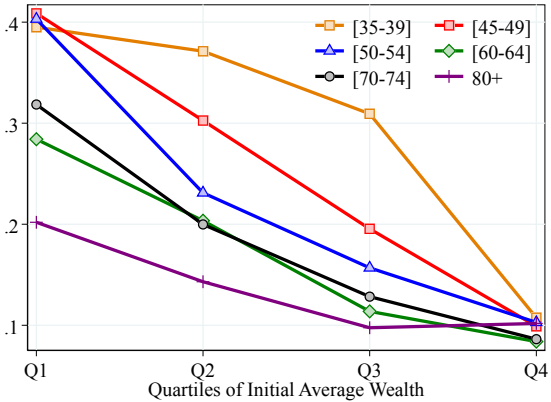
- **Old Money:** start and maintain large share on risky assets
- **New Money:** significant accumulation of private equity

Old Money vs. New Money: Lifetime Returns

▸ Back



(a) Returns on Net Wealth

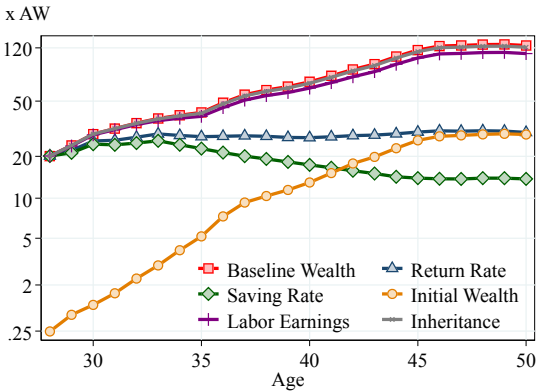


(b) Returns on Equity

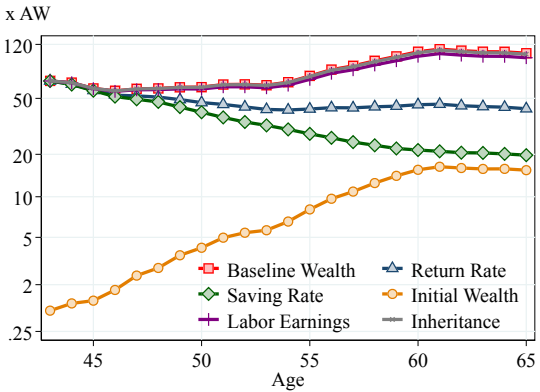
- Average lifetime return for 2015-top 1% group by their 1993 wealth ▸ Others
- **New Money** (Q1) earn higher returns mostly from equity

Why are the top 0.1% so wealthy? Age Groups

Back



(a) 50/54 years old

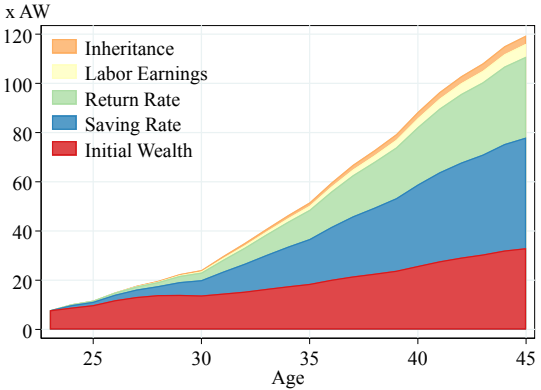


(b) 65/69 years old

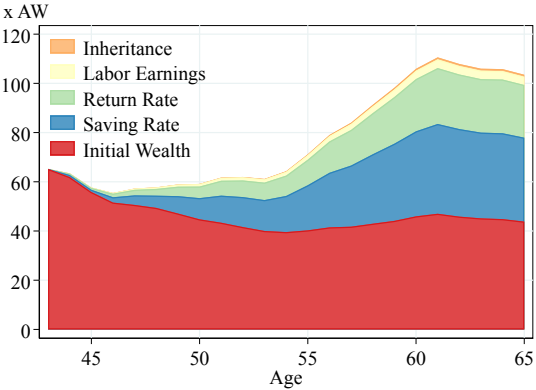
- Change one component and the time, keep the rest constant
- Initial conditions matter a lot for the rich

Why are the top 0.1% so wealthy? Age Groups

Back



(a) 45/49 years old

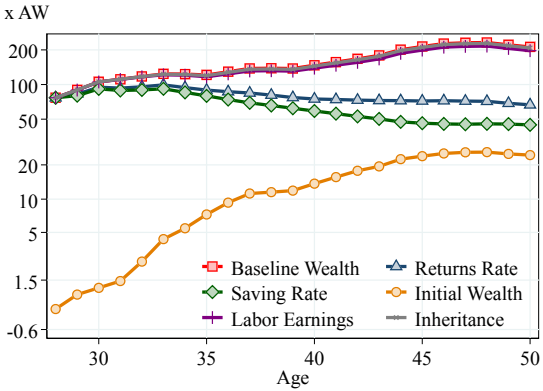


(b) 65/69 years old

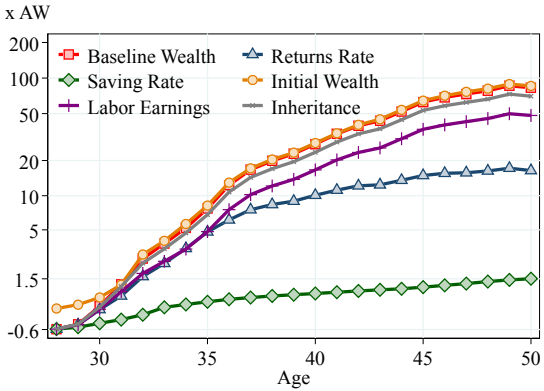
- The proportion accounted for by initial wealth increases with age
- Still, saving rate and returns account for significant fraction

Old Money vs. New Money in Top 0.1%: One Change

Back



(a) Old Money

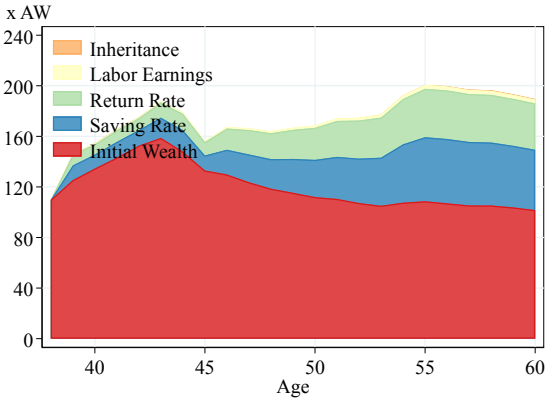


(b) New Money

- Initial conditions matter for the **Old Money**
- Saving rate and returns for the **New Money**

Old Money vs. New Money in Top 0.1%: 60 yrs old

Back



(a) Old Money

(b) New Money

- Importance of initial conditions (we pick them later in life) increases

Decomposing lifetime resources

▸ Back

To understand the sources of wealth accumulation, we consider household budget constraint

(Similar to Black, Devereux, Landaud, Salvanes, 2022)

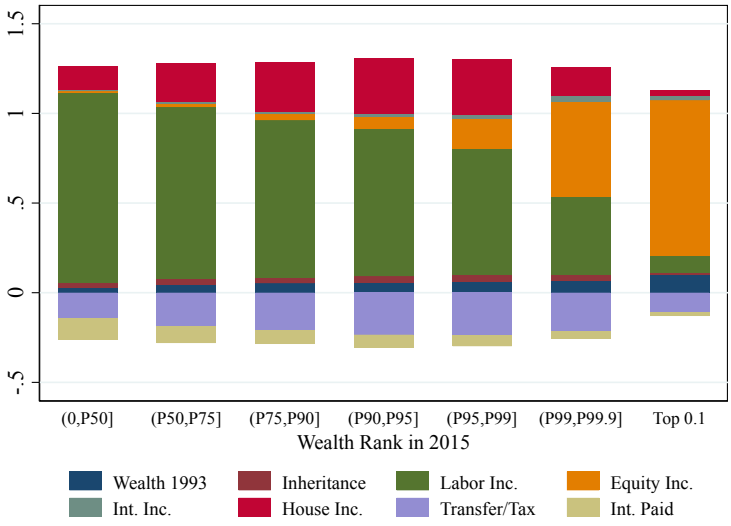
$$W_{i,2015} = W_{i,1993} + \underbrace{\sum_{t=1994}^{2015} L_{i,t} + H_{i,t} + RK_{i,t} + RK^{e}_{i,t} + CG_{i,t} + T_{i,t} - LB_{i,t}}_{\overline{Y}_i = \text{total lifetime resources}} - \sum_{t=1994}^{2015} C_{i,t},$$

- $W_{i,t}$ is net wealth of household i in $t \in \{1993, 2015\}$
- $L_{i,t}$ is labor income of i in year t
- $H_{i,t}$ is inheritances and intervivos
- $RK_{it} + RK^{e}_{it}$ is income from assets and dividends
- $CG_{i,t}$ is capital gains
- T_{it} net taxes and transfers
- LB_{it} is interest paid for liabilities
- C_{it} is consumption

Normalize by total lifetime resources, $\overline{Y}_{it}$, and compare hhs across wealth distribution

Decomposition of lifetime resources for 50 year old

Back



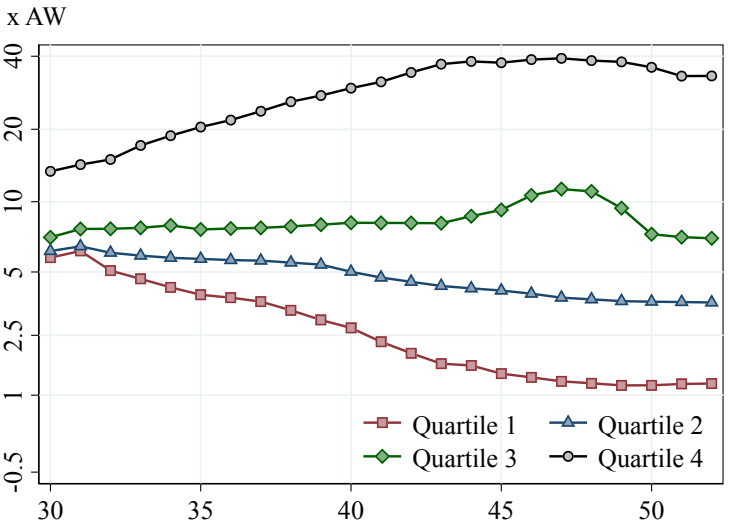
Wealthy: lifetime income mostly from **equity (div + cap. gains)**

Middle and low wealth: lifetime income mostly from **labor**

Initial wealth and **inheritances** on average account for small fraction of resources even at top

Old Money vs. New Money in Top 0.1%: Forward-Looking Wealth Profiles

Back

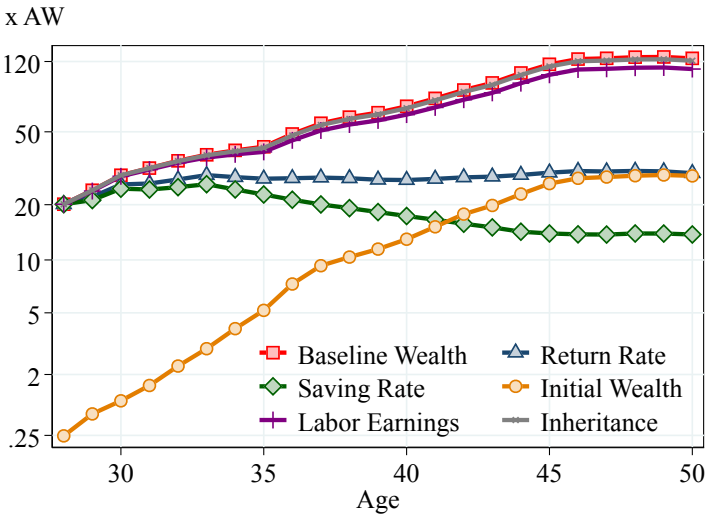


Wealth profile for top 0.1% at age 25 by ending wealth quartile (2015)

"Squanderers" (Q1) Some start quite rich and end up poor

Counterfactual Average Wealth Profiles

Back



Chang only one factor and keep the rest of the variables intact:

- Rate of returns $\longrightarrow 30 \times$ AW
- Saving rate $\longrightarrow 15 \times$ AW
- Initial Wealth $\longrightarrow 15 \times$ AW
- Labor income $\longrightarrow \sim < 120 \times$ AW
- Inheritance $\longrightarrow \sim < 120 \times$ AW

Budget constraint is non-linear.

- e.g., low income reduces role of savings too.
- Shapley-Owen decomposition.