Topics in Economics

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Sciences Po, CNRS & CEPR

November 2024

On Inequality and Redistribution

- History of Modern Macroeconomics

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  - First-generation models: dynamic models with rational expectations
    - Equilibrium, solve, calibrate with a representative agent

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    - Amplification, inequality $\Rightarrow$ macro

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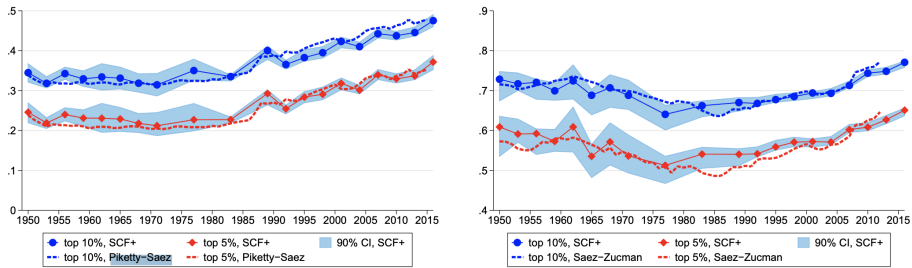
- This class: **On inequality and the welfare state**

Rising Income and Wealth Inequality

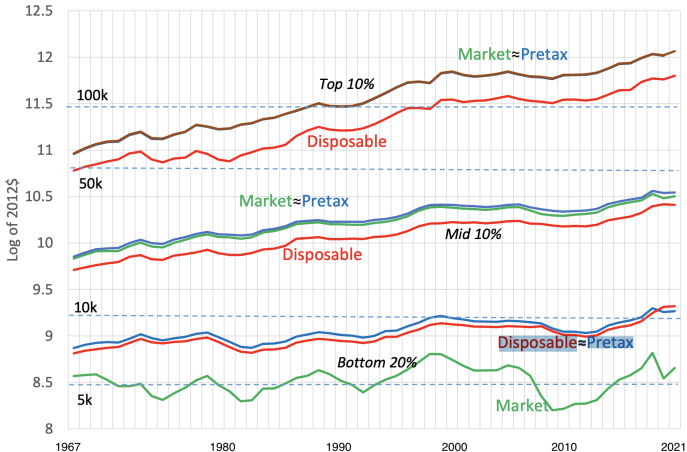
Figure 5: Top 5% and top 10% income and wealth shares



(a) Income (b) Wealth

- Top-income and -wealth shares have increased (SCF+, United States)
  Kuhn, Schularick and Stein (2020)

No Income Growth for the Poor



- Household income has been flat for 5 decades at the bottom (CPS, United States)

  Heathcote, Violante, Perri and Zhang (2023)

On Inequality and Redistribution

- Two main questions
  - Should we tax wealth? Or capital income?
    - *"Heterogeneity and Persistence in Returns to Wealth"*
      A. Fagereng, L. Guiso, D. Malacrino and L. Pistaferri, Econometrica 2020
    - *"Use It or Lose It: Efficiency and Redistributional Effects of Wealth Taxation"*
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  - Should we implement a Universal Basic Income?
    - Some data on long-run trends of the welfare state in the United States
      National Accounts, Moffitt, my own work
    - *"Universal Basic Income: A Dynamic Assessment"*
      D. Daruich and R. Fernandez, AER 2024

History of Capital Income Taxes

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- Why do people accumulate so much wealth?

Heterogeneous Capital Returns Theory

- New theoretical literature in the early 2010s: **heterogeneous capital returns**
  - Benhabib, Bisin, and Zhu (2011), Benhabib, Bisin, and Luo (2019)
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  - Very simple idea: labor income is additive, capital income is multiplicative
- A simple example with Bob and Jane
  - Bob and Jane start with a stock of wealth $w_0 = 100$ (consume $c = 0$)
  - Bob earns $y_\ell^b = 110$ and makes 10% of returns on wealth
  - Jane earns $y_\ell^j = 100$ and makes 20% of returns on wealth

Heterogeneous Capital Returns **Theory**

- A simple example with Bob and Jane (cont.)
  - In year 1, Bob has $w_1 = w_0 + y_\ell^b + r^b \times w_0 = 100 + 110 + 10 \times 100 = 220$

    Jane has $w_1 = w_0 + y_\ell^j + r^j \times w_0 = 100 + 100 + 20 \times 100 = 220$

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    Jane has $w_1 = w_0 + y_\ell^j + r^j \times w_0 = 100 + 100 + 20 \times 100 = 220$
  - In year 2, Bob has $w_2^b = w_1 + y_\ell^b + r^b \times w_1 = 220 + 110 + 10 \times 220 = 352$

    Jane has $w_2^j = w_1 + y_\ell^j + r^j \times w_1 = 220 + 100 + 20 \times 220 = 364$

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  - In year 5, Bob has $w_5^b = 832$, Jane has $w_5^j = 992$
  - In year 10, Bob has $w_{10}^b \approx 2012$, Jane has $w_{10}^j \approx 3215$
  - ...

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- Needed ingredients for capital returns to generate (a lot of) wealth inequality
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- Plausible in the data?

Heterogeneous Capital Returns **Data**

Fagereng, Guiso, Malacrino, and Pistaferri (2020)

- Norwegian administrative data
  - Individual tax records 2005-2015
    - Labor and capital income
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- Compute individual returns to wealth
  - 33 millions of observations (pooling all years)

Heterogeneous Capital Returns **Data**

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- Large heterogeneity in portfolios
- Very heterogeneous returns on wealth
  - Large heterogeneity *overall*
    - Large heterogeneity across assets
    - Large heterogeneity within classes of assets
  - Large scale dependence: from net worth-10th to -90th percentile
  - Strong persistence across generations

Heterogeneous Capital Returns Portfolio Compositions

TABLE 1A

PORTFOLIO COMPOSITION OF NET WORTH, BY SELECTED FRACTILES[a]

	Gross Wealth Shares				Leverage Ratios			
	Safe	Risky	Housing	Private Equity	Consumer Debt	Student Debt	Long-Term Debt	Gross Wealth (Logs)
Bottom 10%	0.51	0.03	0.43	0.02	0.50	2.47	9.08	10.73
10–20%	0.78	0.03	0.18	0.01	0.42	3.08	3.39	9.06
20–50%	0.31	0.02	0.66	0.01	0.01	0.05	0.40	11.89
50–90%	0.11	0.02	0.86	0.02	0.00	0.01	0.21	13.42
90–95%	0.12	0.02	0.81	0.05	0.00	0.00	0.12	14.12
95–99%	0.13	0.03	0.73	0.11	0.00	0.00	0.10	14.55
99–99.9%	0.15	0.04	0.44	0.36	0.00	0.00	0.07	15.41
99.9–99.99%	0.14	0.04	0.11	0.71	0.00	0.00	0.04	16.94
Top 0.01%	0.08	0.04	0.03	0.85	0.00	0.00	0.02	18.78

[a]The table reports the share of gross wealth in safe assets (cash/deposits, bonds, outstanding claims and receivables), risky assets (foreign assets, mutual funds, directly held listed stocks), housing, private business wealth, consumer debt, student debt, and long-term debt (mortgages and personal loans) for Norwegian taxpayers against selected fractiles of the net worth distribution. Debt leverage values are winsorized at the top 1%. In the last column, we report the logarithm of real gross wealth. Data are for 2005–2015.

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Heterogeneous Capital Returns

TABLE 3

RETURNS TO WEALTH: SUMMARY STATISTICS[a]

Wealth Component	Mean	St. Dev.	Skewness	Kurtosis	P10	Median	P90
Net worth (before tax)	0.0379	0.0859	−0.79	47.75	−0.0308	0.0321	0.1109
Net worth (after tax)	0.0365	0.0781	−0.71	36.88	−0.0283	0.0316	0.1067
Net worth (before tax, unweighted)	0.0004	0.2205	−6.73	68.46	−0.0600	0.0230	0.1037
Net worth (after tax, unweighted)	0.0155	0.1546	−5.28	56.42	−0.0449	0.0247	0.1040
Financial wealth	0.0105	0.0596	−1.78	22.17	−0.0171	0.0084	0.0530
Safe fin. assets	0.0078	0.0188	4.38	53.52	−0.0106	0.0059	0.0268
Risky fin. assets	0.0425	0.2473	−0.08	6.22	−0.2443	0.0418	0.3037
Non-financial wealth	0.0511	0.0786	1.80	15.47	−0.0215	0.0429	0.1275
Housing	0.0485	0.0653	0.73	9.95	−0.0209	0.0441	0.1165
Private equity	0.1040	0.5169	18.01	836.79	−0.0531	0.0052	0.3616
Debt	0.0236	0.0216	2.51	29.50	0.0030	0.0215	0.0461
Long-term debt	0.0230	0.0209	3.54	56.92	0.0038	0.0209	0.0446
Consumer debt	0.0961	0.1086	4.60	82.60	−0.0124	0.0741	0.2119
Student debt	0.0078	0.0260	0.68	4.14	−0.0213	0.0074	0.0399

[a]The table reports summary statistics for various measures of real returns to wealth, pooling data for 2005–2015. Except when noted, all returns are value-weighted.

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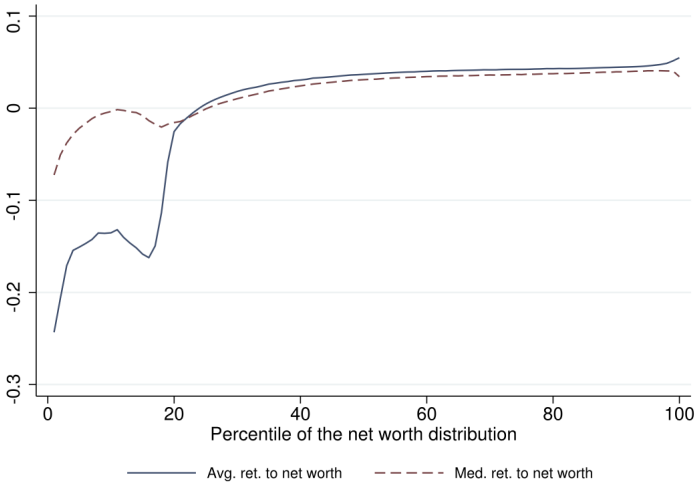
Heterogeneous Capital Returns Scale Dependence



Panel A: Average and median return to net worth

Heterogeneous Capital Returns **Scale and Type Dependence**

- What explains heterogeneous capital returns within a class of assets?

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- Active literature
  - *"Why Are the Wealthiest So Wealthy?"*
    Salgado, Halvorsen, Ozkan and Hubmer, R&R Econometrica (2024)
  - Many other papers looking at ...

Implications for Taxation

- New question for taxation: should we tax capital income? Or the stock of capital?
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- Under **homogenous returns**, taxing capital = taxing wealth

$$(1 + r(1 - \tau_k))a_i = (1 - \tau_a)(1 + r)a_i$$

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- What if returns are heterogeneous?

$$(1 + r_i(1 - \tau_k))a_i \text{ vs. } (1 - \tau_a)(1 + r_i)a_i$$

"Use it or lose it!" Guvenen et al. (2023)

- Assume two agents, a and b,
  - Same wealth $k = \$1000$; but different returns: $r^a = 0 < r^b = 0.2$

"Use it or lose it!" Guvenen et al. (2023)

- Assume two agents, a and b,
  - Same wealth $k = \$1000$; but different returns: $r^a = 0 < r^b = 0.2$
- Policy 1: $\tau^k = 10\%$ on capital income
  - Agent a pays $\$0$
  - Agent b pays $10\% \times 20\% \times 1000 = \$20$

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In a dynamic general-equilibrium model

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3. "Price" channel
   - Wages and interest rates will adjust

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- Overlapping generations (OLG) model
  - Age h, live up to H years
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  - Consumption-savings decision
  - Portfolio choice
    - Choose how much to invest in own technology ("entrepreneurship")

    $=>$ No occupation decision, intensive margin

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- Final good: $Y = Q^{\alpha} L^{1-\alpha}$
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$$\begin{aligned}\Pi(a,z;\tau) &= a + (ra + \pi(a,z) \times (1-\tau_k)) \\ &= a \times (1-\tau_a) + (ra + \pi(a,z))\end{aligned}$$

Environment Household dynamic problem

- Choose how much to work (when $h \leq R$), consume, and save in assets

$$V_h(a, \bar{z}, \mathcal{I}, e, \kappa) = \max_{c,n,a'} u(c, n) + \beta s_{h+1} \mathbb{E}\left[V_{h+1}(a', \bar{z}, \mathcal{I}', e', \kappa)\right]$$

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- Equilibrium: $\int a = \int k$

Calibration

- Standard earnings risk
- Dynamics of entrepreneurship to match fast wealth growth of super wealthy (Forbes 400)
- Collateral constraint: $\nu(z) = 1 + \varphi(\bar{z} - \bar{z}_0)$, with φ to match business debt/GDP

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- Taxes: $\tau_k = 25\%$, $\tau_\ell = 22.4\%$, $\tau_c = 7.5\%$, $\tau_a = 0\%$

Calibration

⇒ Generates high wealth inequality!

	top-50	top-10	top-1	top-0.5	top-0.1
Data (SCF+)	0.99	0.75	0.36	0.27	0.14
Model	0.97	0.66	0.36	0.31	0.23

- Model : 50% households with no business income, 7% earn majority of income from business ("entrepreneur")

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- Suddenly and unexpectedly . . . steady-state comparison
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  - Lower r, higher wages, large welfare gains: $+6.8\%$! (2020 calibration)

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  - "Use-it-or-loose-it" [fixing prices & decision rules to benchmark] $K \uparrow$
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- All three channels are approximately of the same magnitude!

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Main Experiment A Wealth Tax

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- Welfare gains by age and entrepreneurial ability

TABLE IX – Welfare Gain/Loss by Age Group and Entrepreneurial Ability

	Entrepreneurial Ability Groups ($\bar{z}_i$ Percentiles)					
Age	0–40	40–80	80–90	90–99	99–99.9	99.9+
groups:	*RN Reform*					
20	7.0	7.3	7.9	8.9	10.6	11.7
21–34	6.5	6.3	6.3	6.6	7.0	6.8
35–49	5.1	4.4	3.9	3.3	1.7	0.1
50–64	2.3	1.8	1.4	0.8	–0.6	–1.8
65+	–0.2	–0.3	–0.4	–0.6	–1.2	–1.8

  - The high-wealth/low-z (= the old) **loose**
  - The young **benefit**... from $\tau_k = 0$ (high z), from higher w (low a)

Optimal Taxation Capital and Wealth Taxes

Optimize steady-state fiscal system

- Optimal wealth tax:
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- Transitions

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    - Side comment: Why are we all using US data?

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- What if high returns reflect rents? Gaillard and Wangner (2023), Scheuer et al.

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  - Many papers: on who becomes rich, who gives what to their kids, housing, ...

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- *"Why Are the Wealthiest So Wealthy? New Longitudinal Empirical Evidence and Implications for Theories of Wealth Inequality"*

  Ozkan, Hubmer, Salgado, Halvorsen, R&R Econometrica (2024)

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  - Where does the wealth of the wealthiest at age 50 come from?
    - Labor income, capital returns, saving rates, inheritances, initial wealth?
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- Accounting . . . complemented with models!

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- Build measures of net wealth and capital returns
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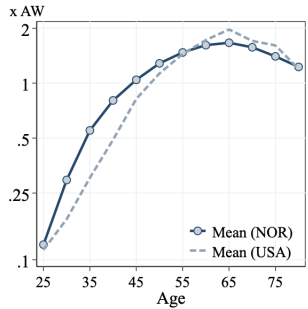
  - Follow Fagereng et al. (2020)
  - Indirect ownership for retained earnings (7 layers)
  - Inheritance severely undervalued
  - Value of equity owned excludes intangibles
- Average wealth (AW) $\approx$ \$437,000 in 2015
  - Life-cycle similar to the US

FIGURE 3 – WEALTH DIST

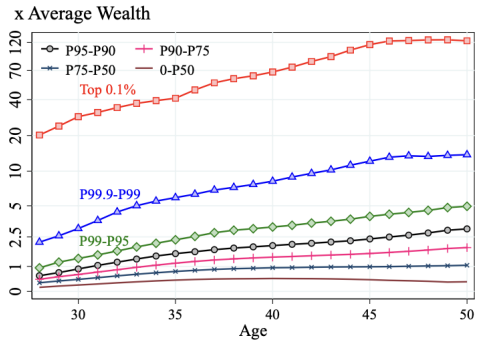
(A) Average Net Worth



Backwards Life-Cycle Profiles

- The Rich Started Rich
  - Top-0.1% 50-54y have 125 AW $\approx$ \$55 million
  - In their late 20s have already 20 AW $\approx$ \$9 million
  - Higher within-cohort inequality earlier in life

(a) Backward-Looking Wealth Profile



Backwards Life-Cycle Profiles

$< P75$	$[P75, P90)$	$[P90, P95)$	$[P95, P99)$	$[P99, P99.9)$	$\geq P99.9$
A. 1994 Wealth Quantile for $BW^{50-54}_{\geq P99.9}$ households					
21.4%	7.4%	5.9%	13.0%	23.2%	29.2%

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    $\Rightarrow$ "Old Money"
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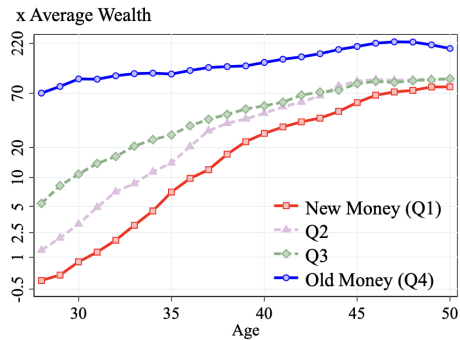
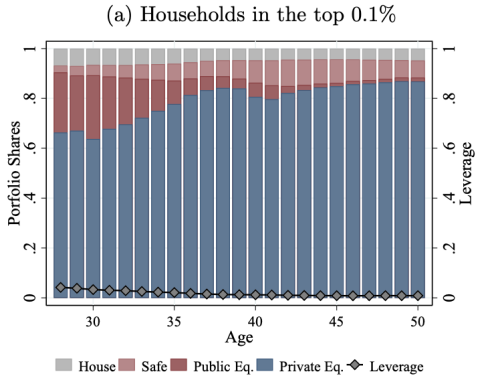


Portfolio Compositions The Rich Hold Equity



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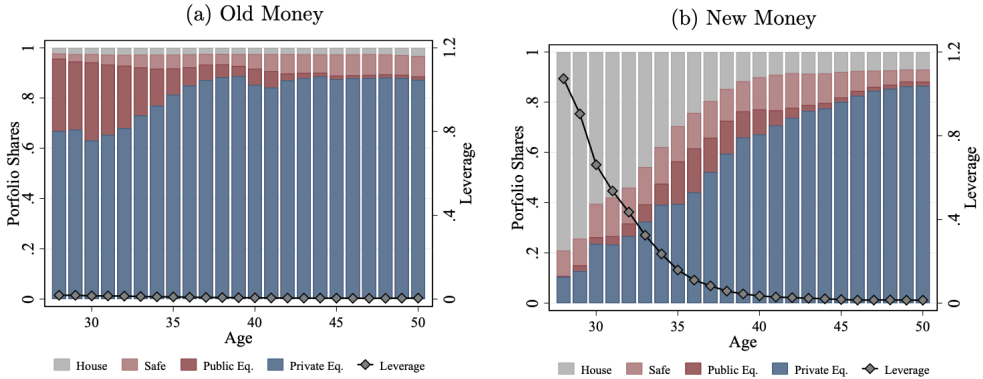


- Public + Private equity always above 80%, with little leverage
  - Old Money: even less housing at younger ages
  - New money: leveraged at younger ages

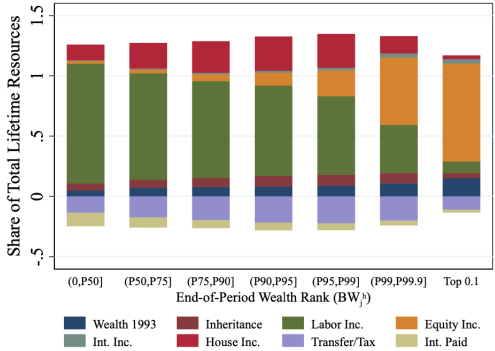
Sources of Income Income of the Rich is Equity Returns

- Accounting equation

$$W_{i,\tau} = W_{i,1993} + \sum_{t=1994}^{\tau} [L_{i,t} + H_{i,t} + R^E_{i,t} + R^S_{i,t} + R^H_{i,t} + T_{i,t} - I^L_{i,t}] - \sum_{t=1994}^{\tau} C_{i,t}$$

Sources of Income Income of the Rich is Equity Returns

Figure 6 – Decomposition of Total Lifetime Resources



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Why are the Wealthiest so Wealthy?

- End wealth can differ because of: inheritances, labor earnings, return rates & saving rates
- Accounting: Shapley-Owen decomposition
  - Simulate the counterfactual evolution of wealth factor by factor

Why are the Wealthiest so Wealthy? Inheritances!

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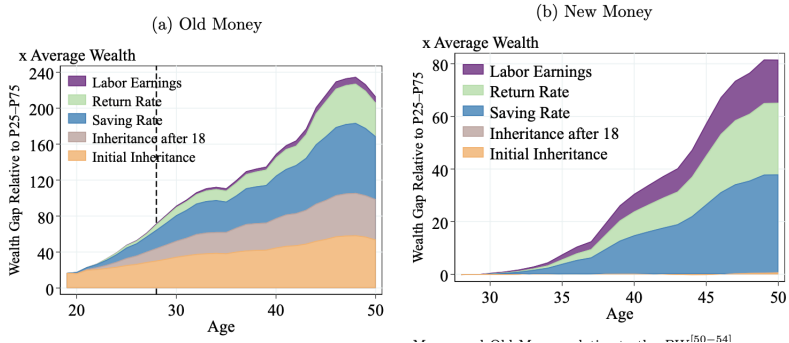

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  - No inheritance, more labor income, mostly returns on equity and saving rates
- How many individuals?...
  - Norway: 5 million individuals ... Age $50-54 \approx 250{,}000$?
  - Top 0.1% of $50-54 \approx 250$ individuals
  - Old Money ≈ 75 individuals, New-Money ≈ 50 individuals?

Why are the Wealthiest so Wealthy?

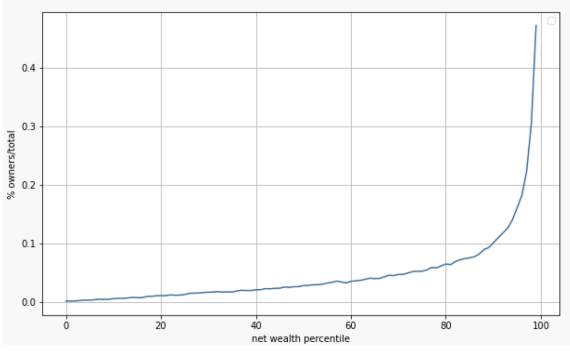
- Going forward: testing alternative models of wealth accumulation

Why are the Wealthiest so Wealthy?

- Going forward: testing alternative models of wealth accumulation
- Going forward: Bacher, Ferriere, Irarrazabal, Lizarraga and Zheng (2024)
  - Same data
  - Focus on private limited liability companies
  - Entrepreneurs or investors? *"When money meet skills"*

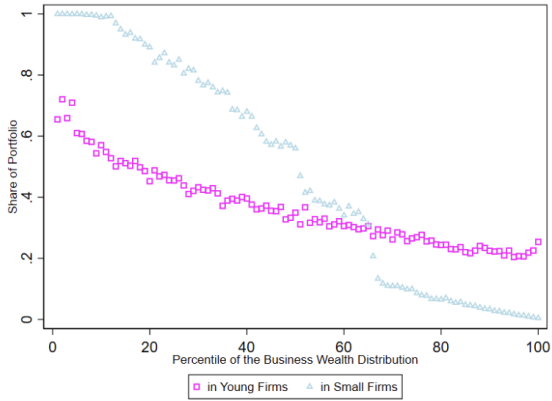
Private Businesses and Wealth Accumulation

- Where are private business owners situated in the net wealth distribution?
  - In the top of the distribution



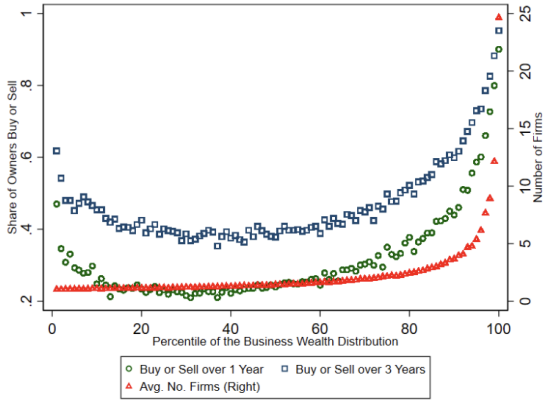
Private Businesses and Wealth Accumulation

- Where are private business owners situated in the net wealth distribution?
- What kind of firms do they owe?
  - Heterogeneity



Private Businesses and Wealth Accumulation

- Where are private business owners situated in the net wealth distribution?
- What kind of firms do they owe?
- How many firms do they owe?
  - Mostly one



Private Businesses and Wealth Accumulation

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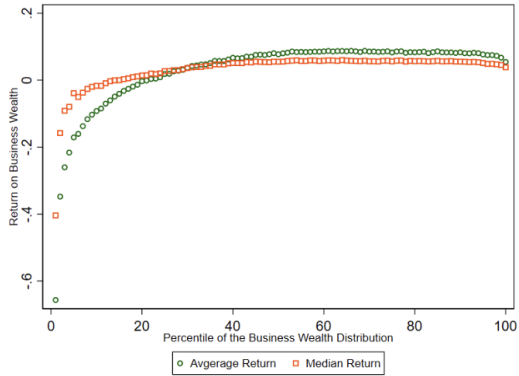
  - Yes! Up to the 50th percentile



Private Businesses and Wealth Accumulation

- Where are private business owners situated in the net wealth distribution?
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- How many firms do they owe?
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Investors or Entrepreneurs

- Empirical distinction bw entrepreneurs & investors
  - Owners who also supply skill
  - Owners who only supply money
- Role Database
  - Entrepreneurs if have a Role and some shares
  - Multiple layers

Investors or Entrepreneurs

- Entrepreneurs? If Manager or board chair and have large shares
  - Entrepreneur-owners have 42% of business wealth, investor-owners have 58%

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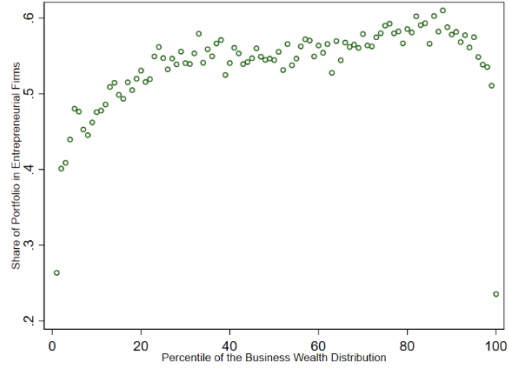

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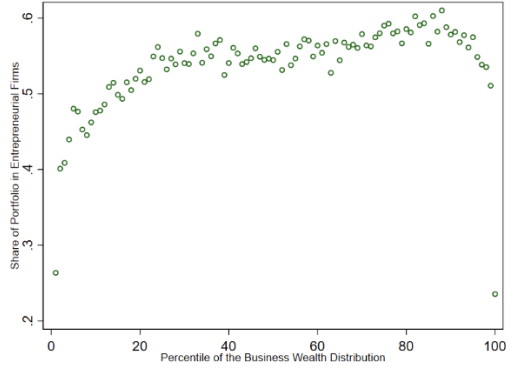

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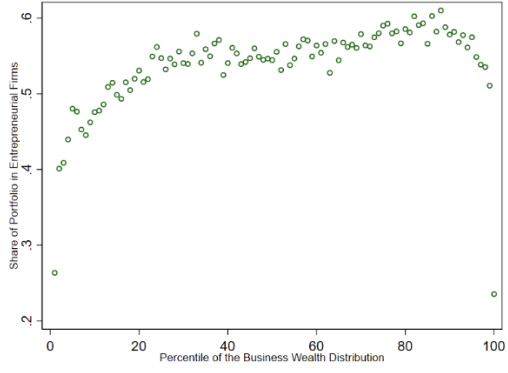

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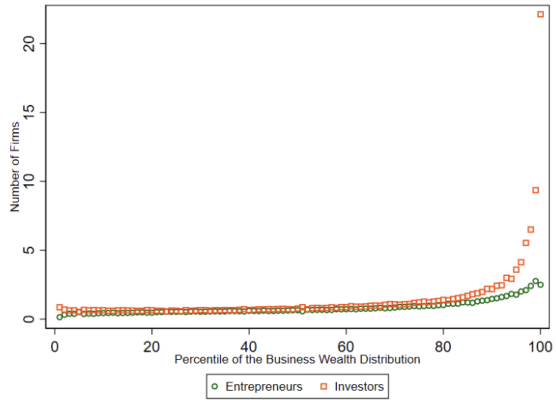
- Top: Serial investors



Investors or Entrepreneurs

- Which investment has higher returns? As entrepreneur or investor?
- How do you make it to the very top? As entrepreneur or investor?

Investors or Entrepreneurs

- Which investment has higher returns? As entrepreneur or investor?
- How do you make it to the very top? As entrepreneur or investor?
- Who can invest in private businesses?
- Should we tax differently entrepreneurs and investors?

On Inequality and Redistribution

- **Broad topic 2**: Transfers
- Focus on the bottom of the income distribution

On Inequality and Redistribution

- **Broad topic 2**: Transfers
- Focus on the bottom of the income distribution
- Brief description of the tax-and-transfer ($t\&T$) system in the US
- Universal Basic Income in models calibrated to the US

The U.S. Tax-and-Transfer System

- Personal income taxes
  - Progressive taxes (brackets) on labor and capital income taxes

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- Non-monetary transfers: spending on education, childcare, ...

Taxes or Transfers?

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  - My pre-$t\&T$ income is $y = \$10$

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- Always consider the joint distribution of taxes and transfers
  - In data, in models!

Marginal or Average Progressivity? 1/2

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  - Bob makes pre-tax income of $\$10$, Jane makes $\$20$

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    - Jane has: $\hat{y}^b = (1 - 20\%) \times \$20 + \$3 = \$19$
    - Bob's average $t\&T$ rate is -10%, Jane's average $t\&T$ rate is 5%
    - Bob and Jane's marginal rate is 20%

  $\Rightarrow$ Progressivity in average rates, no progressivity in marginal rates!

Marginal or Average Progressivity? 2/2

- More progressivity in marginal rates
  - World 2. Tax of 0% when $y < \$15$, tax of 10% when $y > \$15$, rebated to both hh

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- More progressivity in average rates
  - World 3. Uniform flat taxes of 30% rebated to both hh
    - Bob has: $\hat{y}^b = (1 - 30\%) \times \$10 + \$4.5 = \$11.5$, average $t\&T$ rate is -15%
    - Jane has: $\hat{y}^b = (1 - 30\%) \times \$20 + \$4.5 = \$18.5$, average $t\&T$ rate is 7.5%

Marginal or Average Progressivity? 2/2

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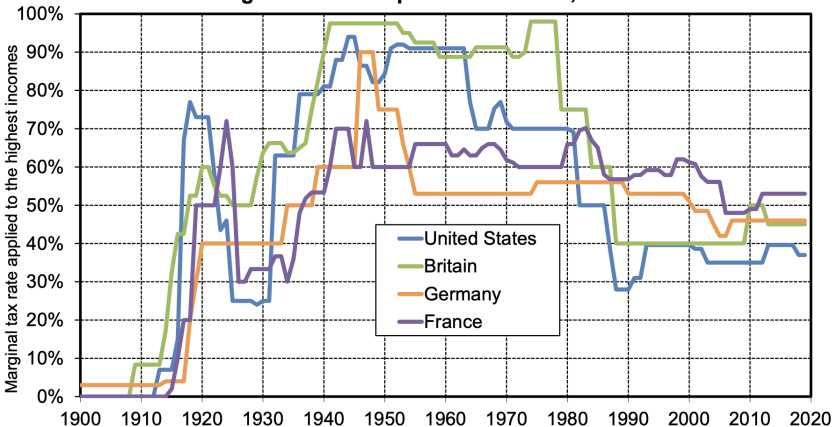
  - Same progressivity as W1 in marginal rates, more progressivity in average

The U.S. Tax-and-Transfer System: Trends Over Time

- Marginal progressivity has decreased over time
- Average progressivity has increased over time
- In-work benefits have become much larger

Marginal Progressivity Has Decreased Over Time

Figure 0.7. The top income tax rate, 1900-2020



Interpretation. The top marginal tax rate applied to the highest incomes averaged 23% in the United States from 1900 to 1932, 81% from 1932 to 1980, and 39% from 1980 to 2018. Over these same periods, the top rate was 30%, 89% and 46% in Britain, 18%, 58% and 50% in Germany, and 23%, 60% and 57% in France. Fiscal progressivity was at its highest level in the middle of the century, especially in the United States and in Britain. **Sources and series**: see piketty.pse.ens.fr/ideology.

Average Progressivity Has Increased Over Time

- Broad definition of transfers

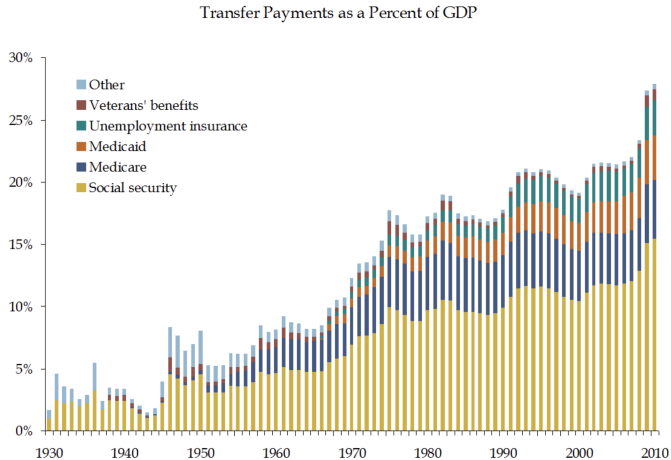
  – For the old

  Social security + Medicare

  – For the poor

  Health-related: Medicaid

  Source: BEA, Econompic (??)



Average Progressivity Has Increased Over Time

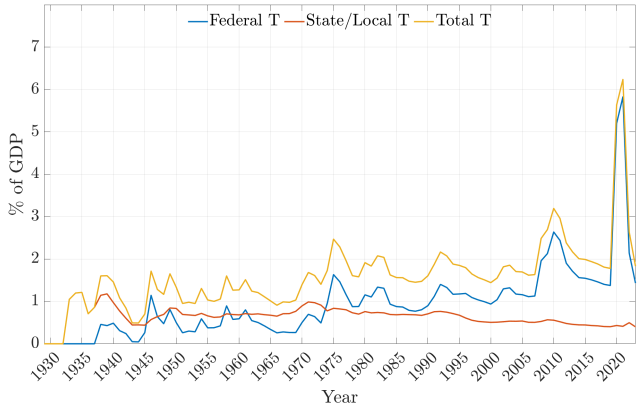
- Narrow definition of transfers

– Federal:

  UI benefits, workers' compensation, food stamps, SSI, refundable tax credits

– State/local:

  Temporary disability insurance, workers' compensation, family assistance, SSI, general assistance energy assistance, other assistanc



Source: NIPA Tables

Optimal Tax-and-Transfer System

- What do models say about optimal progressivity?
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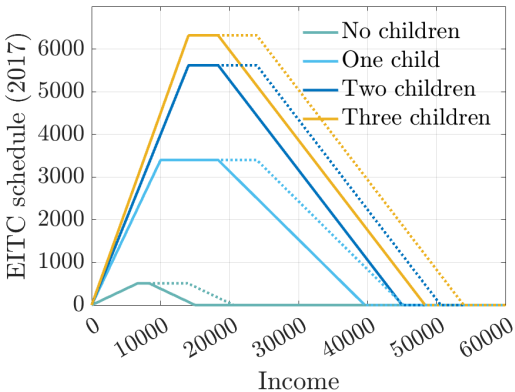
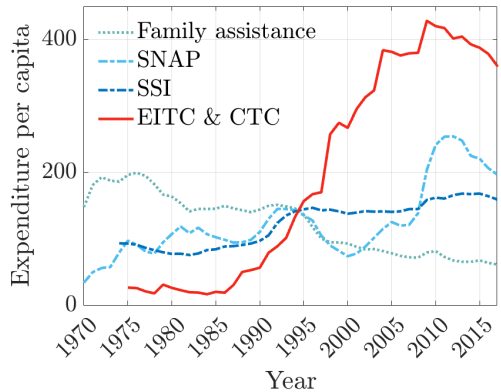
    - To incentivize labor supply and savings
  - How to implement that?
    - Large transfers, high but flat taxes work pretty well
    - Ferriere, Gruebener, Navarro and Vardishvili (2023)

In-Work Benefits Have Become More Important





- Source: IRS and NIPA, my own computations

Have We Gone Too Far?

- In-work benefits are good for incentives...
  - but don't provide income support to the very poor

Have We Gone Too Far?

- In-work benefits are good for incentives...
  - but don't provide income support to the very poor
- Should we rather implement a Universal Basic Income?
- Daruich and Fernandez (2024)

A Rich Quantitative Model to Evaluate UBI

- Objective of the paper:
  - Use a general equilibrium overlapping generations (GE-OLG) model
  - Analyze long-term UBI effects on welfare, inequality, and intergenerational mobility
    - Much cheaper than a real experimentation!

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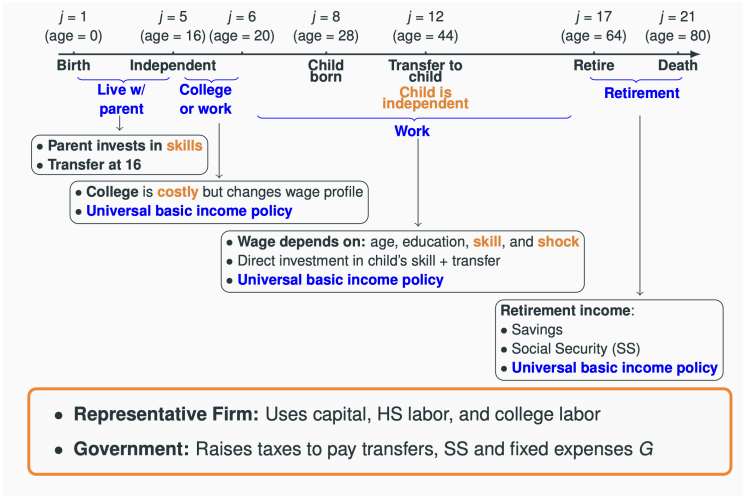
  - Distortionary taxes to fund UBI

The Model


$j = 1$ (age = 0)
$j = 5$ (age = 16)
$j = 6$ (age = 20)
$j = 8$ (age = 28)
$j = 12$ (age = 44)
$j = 17$ (age = 64)
$j = 21$ (age = 80)
Birth
Independent
Child born
Transfer to child
Retire
Death
Live w/ parent
College or work
Child is independent
Retirement
Work
• Parent invests in skills
• Transfer at 16
• College is costly but changes wage profile
• Universal basic income policy
• Wage depends on: age, education, skill, and shock
• Direct investment in child's skill + transfer
• Universal basic income policy
Retirement income:
• Savings
• Social Security (SS)
• Universal basic income policy
• Representative Firm: Uses capital, HS labor, and college labor
• Government: Raises taxes to pay transfers, SS and fixed expenses G

The Model

$$V_j(a,\theta,e,\eta,\theta_k) = \max_{c,a',h,m} u(c,h) + \beta \mathbb{E}\left[V_{j+1}\left(a',\theta,e,\eta',\theta_k'\right)\right]$$

$$c + a' + m = y + a(1+r) - T(y,a,c)$$

$$y = w_e h E_{e,j}(\theta,\eta) \quad , \quad a' \geq \underline{a}_{e,j} \quad , \quad 0 \leq h \leq 1, \quad \eta' \sim \Gamma_{e,j}(\eta)$$

$$\underbrace{\theta_k'}_{\substack{\text{Next period}\\ \text{child's skills}}} = \left[\alpha_{1j} \underbrace{\theta_k^{\rho_j}}_{\substack{\text{Current}\\ \text{child's skills}}} + \alpha_{2j} \underbrace{\theta^{\rho_j}}_{\substack{\text{Parent's}\\ \text{skills}}} + \alpha_{3j} \underbrace{I^{\rho_j}}_{\substack{\text{Parental}\\ \text{investments}}}\right]^{1/\rho_j} \exp(\nu), \nu \sim N(0,\sigma_{j,\nu})$$

$$I = \bar{A} \underbrace{m}_{\text{Money}} \qquad m \geq 0$$

Main Forces

- Why UBI Could Be Good?
  - Reduces inequality by providing unconditional transfers to all
  - Improves intergenerational mobility
    - Low-income households can invest more in their kids' skills
    - Kids from low-income families can go to college more

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    - Low-income households can invest more in their kids' skills
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- Why UBI Could Be Bad?
  - Higher transfers and associated higher taxes both contribute to...
    - Lower labor supply, lower savings and capital stock
    - Lower parental investments in child skills, lower college enrollment
    - Lower output and consumption!

General Equilibrium Results

- Impact of UBI of $\approx \$1{,}000/\text{month}$ per adult:
  - Labor supply, education, and capital stock decline
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- Impact of UBI of $\approx \$1{,}000/\text{month}$ per adult:
  - Labor supply, education, and capital stock decline
  - Higher mobility and lower inequality
- Overall, large welfare losses
- Decomposition
  - Effects of higher taxes vs. higher transfers
  - Endogenous response of capital vs. skills
  - General equilibrium
  - Current cohorts vs. newborns

What Next?

- Richer household heterogeneity
- EITC vs. transfers that phase-out but do not phase-in