Private Innovation and Wealth Inequality

Mehran Ebrahimian Alexander Ljungqvist

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– Wealth inequality in the U.S. has risen sharply (Saez and Zucman, 2016):
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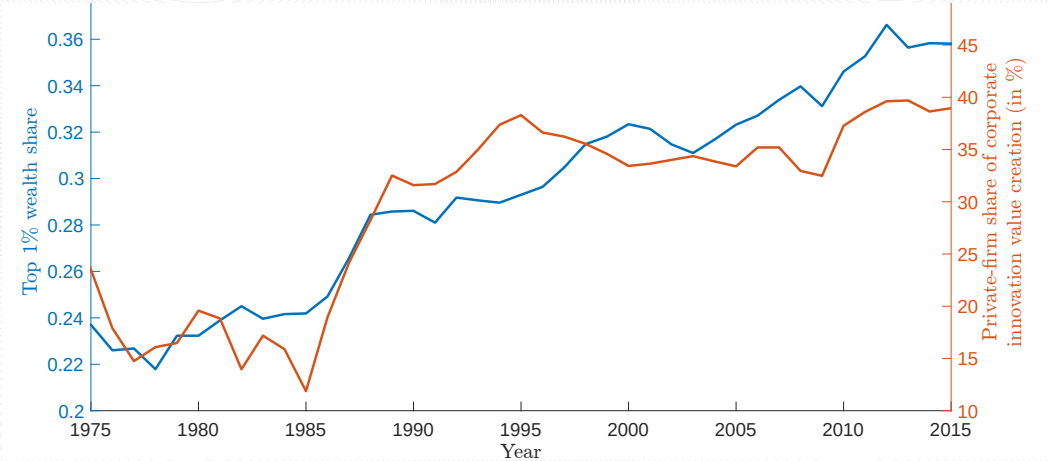
Private innovation share (right) and inequality (left)



Correlation ≈ 0.90 between top 1% wealth share and private-firm innovation share

This paper

Core contribution:

Shift of innovation from public to private firms

$+$

Exclusive access for the wealthier to private innovation value creation ("innovation rents")

$\Downarrow$

Rising top wealth concentration

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⇓

Rising top wealth concentration

How we do this:

- Construct a macro measure of **corporate innovation rents**
- Decompose innovation rents: **public** vs. **private** firms
- Embed **exclusive access** for the wealthy to private innovation rents in a structural model

Main findings

Baseline simulation (1979–2015):

- Data: Top 1% wealth share rises by $\approx$ 13 p.p.

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Policy experiments:

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Conclusion: Access to innovation rents—not average capital returns—drives top wealth dynamics

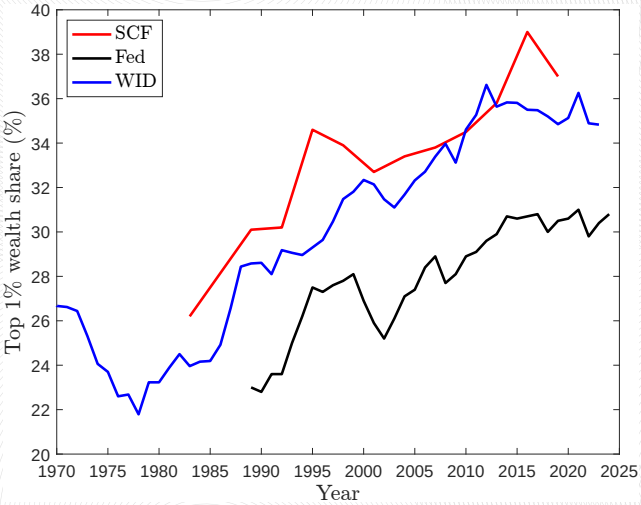
Related literature

1. **Wealth inequality, Return heterogeneity:** Quadrini (1999); Cagetti and De Nardi (2006); Benhabib and Bisin (2018); Gabaix et al. (2016); Bach et al. (2020); Fagereng et al. (2020); Hubmer et al. (2021); Ebrahimian and Sodini (2024); Gomez and Gouin-Bonenfant (2025)
2. **Private markets, Access, Taxation:** Lindsey and Stein (2019); Canipek (2024); Gocmen et al. (2025)
3. **Micro, Household finance, Valuation:** Greenwald et al. (2021); Catherine et al. (2023, 2025); Gomez and Gouin-Bonenfant (2024); Gomez (2025)

This paper: Links return heterogeneity to differential access to private innovation rents, in explaining the rise in top wealth concentration

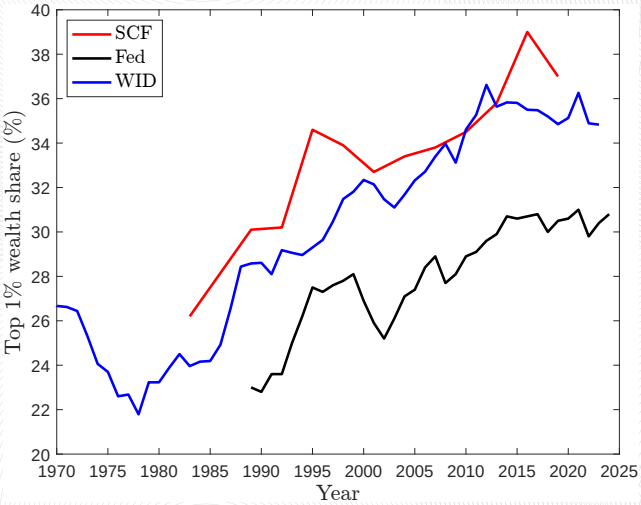
Data

Rising wealth inequality



- Persistent upward trend in top wealth concentration since 1980

Rising wealth inequality



- Persistent upward trend in top wealth concentration since 1980
- ∗ Our goal: link this to private innovation, and restricted household access

Measuring innovation value creation

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Following Bias and Ljungqvist (2025), we estimate patent-level values for all corporate patents granted in 1975-2015:

- **Public firms:** Kogan et al. (2017) $\rightarrow$ E(discounted future monopoly profits) = innovation rents (before accounting for R&D costs)
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Net corporate innovation rents in year t:

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- Scale by aggregate wealth $\rightarrow$ innovation *wealth change* (V_t/W_t)
- Divide between public and private firms $\rightarrow$ *private* innovation share (e_t)

$\rightarrow$ How much wealth does corporate innovation create a year / where it comes from?

Innovation wealth change (V_t/W_t)

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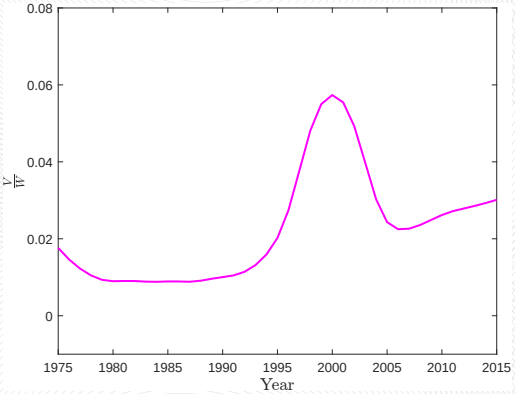
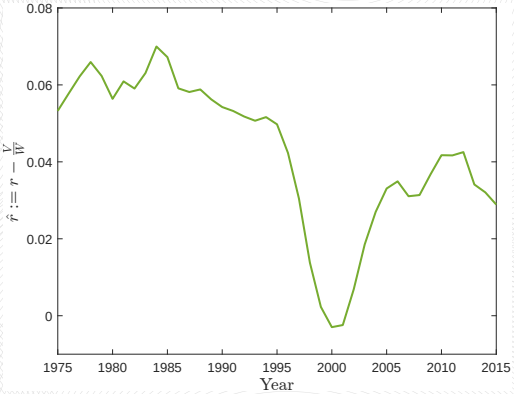


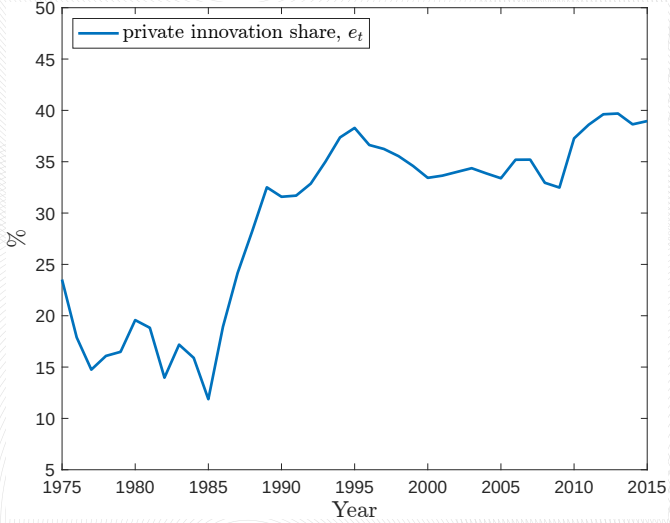


Innovation rents $V_t \approx 2.2\%$ of wealth per year on average

macro/endog. growth calibrations

- Large compared to the economy's non-innovation return on capital $\hat{r}_t = r_t - V_t/W_t$

Private innovation share (e_t)



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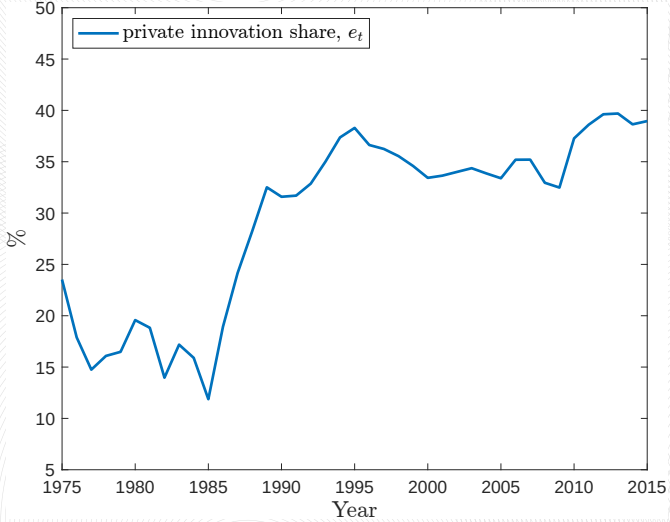

- Private innovation share more than doubles after mid-1980s

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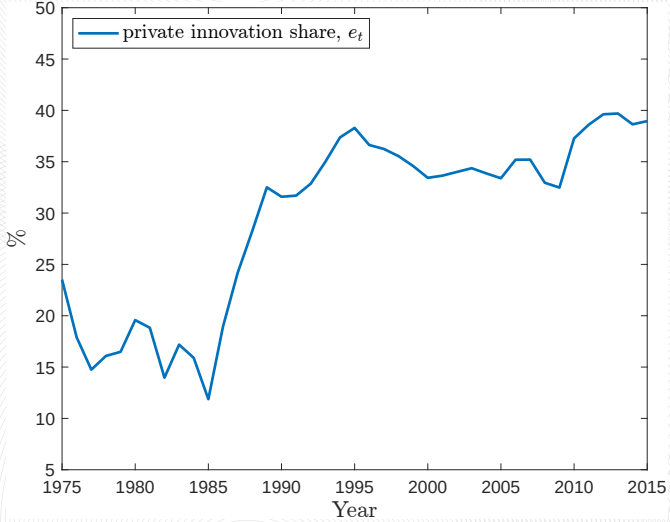


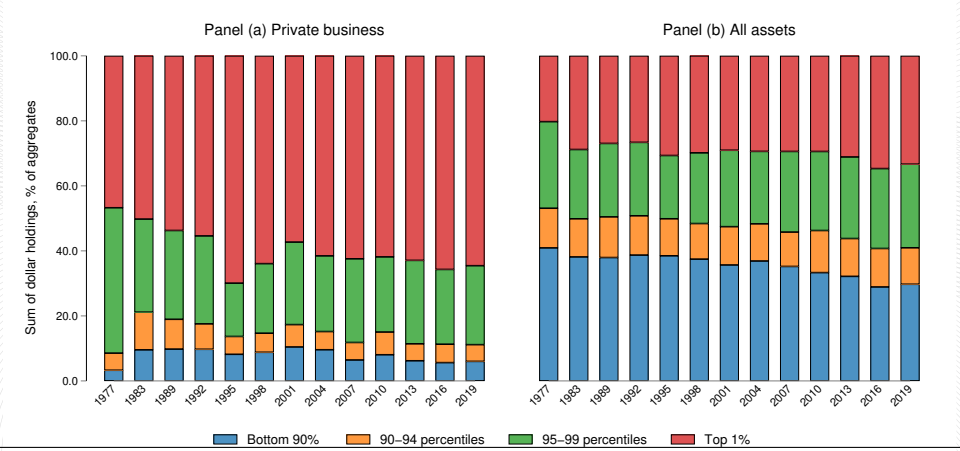
- Private innovation share more than doubles after mid-1980s

∗ Most households do not have access to this ← ownership of private business equity is concentrated at the top

Private-business equity holdings, % of aggregate (SCF):

numbers

- by net-wealth percentile



Summary — Why the private share matters?

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- Private firms increasingly generate the highest-value innovations
- Their equity is disproportionately held by wealthy households
- A larger private share therefore reallocates innovation rents toward the top of the wealth distribution — top wealth concentration

— Quantify this channel? Next...

Model

Wealth accumulation with differential access

Upper-tail wealth dynamics (Gabaix et al., 2016):

$$dw_{it} = \left(r_t^m + \mathbf{1}\{w_{it} > \bar{w}_t\}\, \Delta_t \right) w_{it}\, dt + \sigma w_{it}\, dZ_{it} + y_t\, dt - c_{it}\, dt$$

- r_t = common ("market") post-tax return
- $\bar{w}_t$ = access cutoff
- Δ_t = wealth accumulation wedge (from access to private innovation rents)
- dZ_{it} = idiosyncratic shocks
- y_t labor income
- $c_{it} = \rho w_{it}$ consumption (EIS=1)

Wealth accumulation wedge, Δ_t

Given their exclusive access to private innovation rents, the wealthy ($w_{it} \geq \bar{w}$) will accumulate wealth at a higher rate, Δ_t

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$$\Delta_t \propto \frac{V_t}{W_t} \times e_t$$

- ...increasing in the innovation wealth change, V_t/W_t
- ...increasing in the private innovation share, e_t
- (...decreasing in capital income taxes)

Comparative statics

- Higher $\Delta \Rightarrow$ accelerate exclusive wealth accumulation at the top, higher top wealth share (both in steady state and transitions)
- Higher $\rho \Rightarrow$ higher consumption (lower saving) $\Rightarrow$ less wealth accumulation, lower steady-state top wealth share
- Higher $\sigma \Rightarrow$ more mobility across wealth distribution ($+$ across the access cutoff) $\Rightarrow$ spreads innovation rents beyond the top $\Rightarrow$ dampens the inequality effects of Δ

Estimation and simulation

Estimation and simulation

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Step 1: Calibrate to 1979 wealth distribution

Step 2: Feed in observed time series

Step 3: Simulate wealth distribution forward to 2015

Estimation and simulation

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- Match top 1% wealth share
- Use data on the common return from capital income, capital taxation, innovation rents, private share in 1979
- Access cutoff: 99th wealth percentile (for now)

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Step 2: Feed in observed time series

- ...including the rising private innovation share e_t

Step 3: Simulate wealth distribution forward to 2015

Estimation

- **Parameter estimated:** subjective discount rate ρ
  - matching the 1979 steady-state top 1% wealth share (one-to-one mapping)
- **Calibration:** idiosyncratic return volatility, $\sigma = .3$ (Bach et al., 2020; Fagereng et al., 2020)
- **Measure key inputs to the wedge:** innovation wealth change V_t/W_t and private innovation share e_t come directly from patent-value and R&D data
- **Not targeted:** the 1979–2015 rise in top wealth inequality—it emerges dynamically when feeding in observed V_t/W_t and e_t

Wealth accumulation wedge (from data)

$$\textbf{Top 1\%:} \quad r_t^m + \Delta_t = (1-\hat{\tau}_t)\hat{r}_t + (1-\tau_t^p)\left(\frac{V_t^l}{W_t} + \frac{V_t^u}{W_t^{top}}\right),$$

$$\textbf{Bottom 99\%:} \quad r_t^m = (1-\hat{\tau}_t)\hat{r}_t + (1-\tau_t^p)\frac{V_t^l}{W_t},$$

- $\hat{r}_t = r_t - V_t/W_t$, non-innovation return on capital (taxed at $\hat{\tau}$)
- $V_t^l = (1-e)V$, innovation value, public firms (taxed at τ_p)
- $V_t^u = eV$, innovation value, private firms (taxed at τ_p)

$$\boxed{r_t^m = r_t^{ave} - \ (1-\tau_t^p)\ e_t\ \frac{V_t}{W_t},\ \Delta_t = (1-\tau_t^p)\ e_t\ \frac{V_t}{W_t}\ \frac{1}{s_t^{top}}}$$

- $r_t^{ave} = (1-\hat{\tau}_t)\hat{r}_t + (1-\tau_t^p)\frac{V_t}{W_t} = (1-\tau_t)r_t$

Heterogeneous returns on wealth

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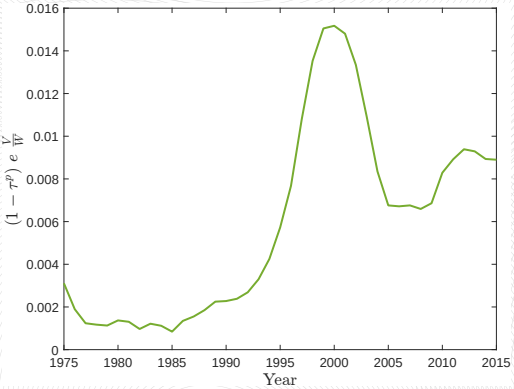
Top 1%: $r_m + \Delta$**, the rest:** r_m

Panel (a)



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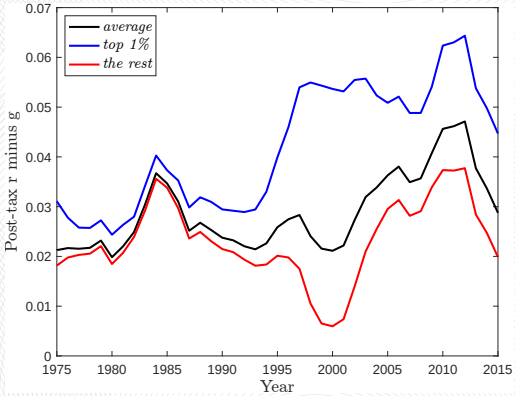
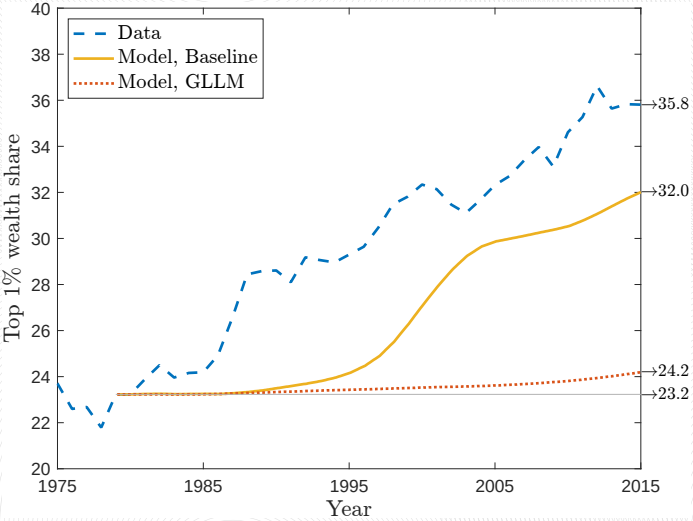


Results

Baseline results



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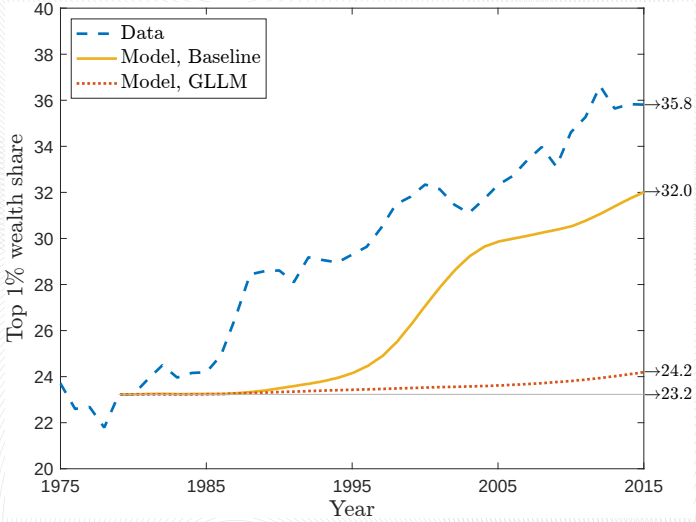

- With exclusive access (baseline) ≈ two-thirds of rise in top 1% share
- Without exclusive access (GLLM) ≈ flat

r minus g | post-tax

Counterfactual: Fix e_t or V_t/W_t at 1979 level

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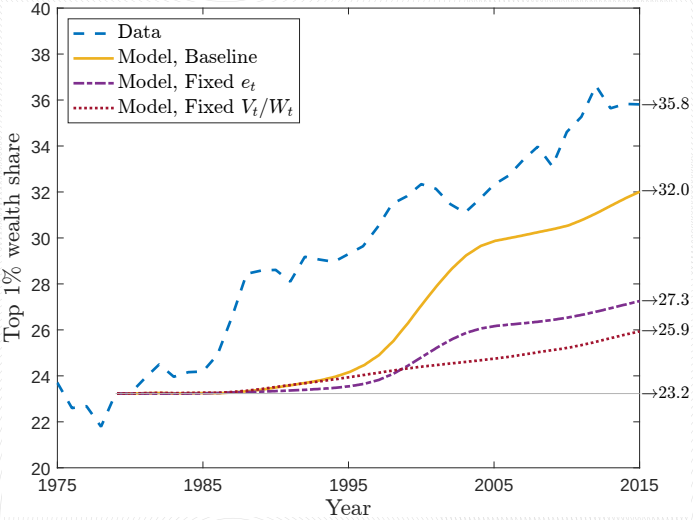

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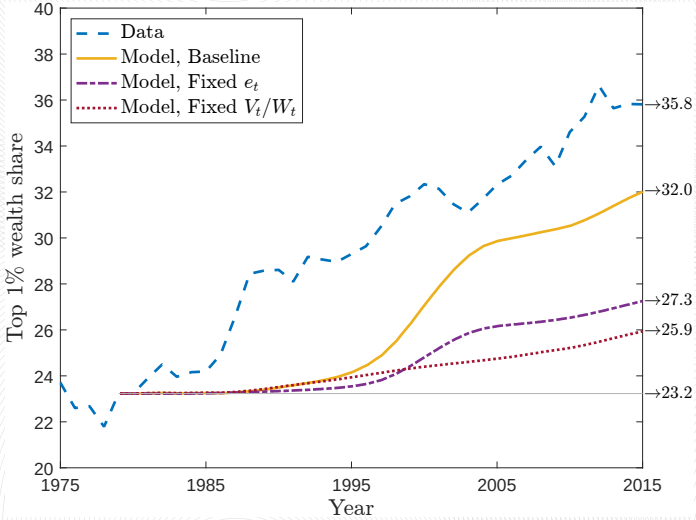

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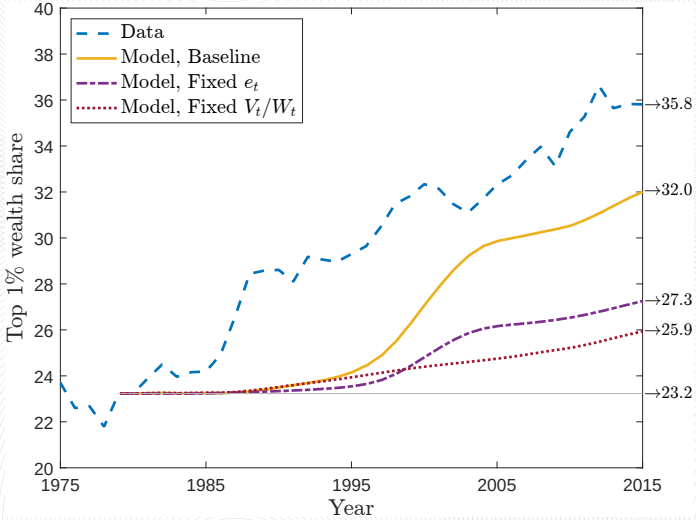

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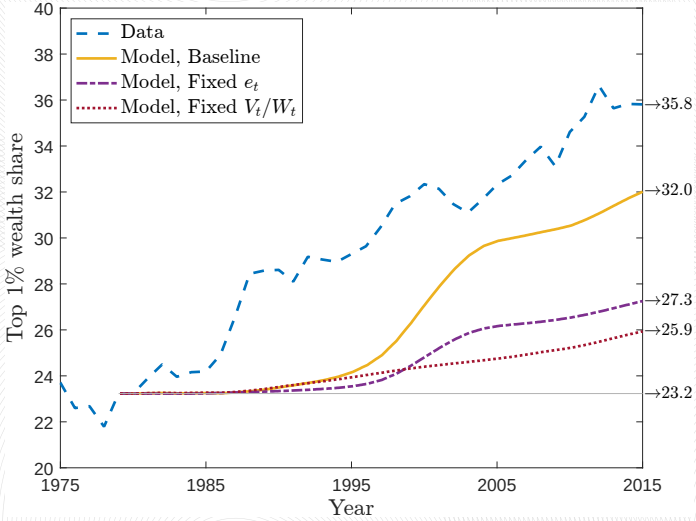

- Without rising private innovation share e_t, inequality increases by $\approx$ 4 p.p.
- Without increasing innovation rents V_t/W_t, inequality increases by $<$3 p.p.
- The rise in V_t/W_t reinforces the impact of rising e_t

Extensions and robustness

Robustness: access thresholds and idiosyncratic risk

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- Alternative idiosyncratic risk σ calibrations

Table: Robustness tests: σ and $\bar{w}_t$

	Data	Model				
		Baseline	$\sigma = 0.2$	$\sigma = 0.4$	Access for top 5%	Access for top 10%
	(1)	(2)	(3)	(4)	(5)	(6)
Top 1% wealth share (%), 1979	23.2	23.2	23.2	23.2	23.2	23.2
Top 1% wealth share (%), 2015	35.8	32.0	33.6	30.4	30.2	29.6
Change (percentage points)	12.6	8.8	10.4	7.2	7.0	6.4

Robustness: access thresholds and idiosyncratic risk

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- Alternative idiosyncratic risk σ calibrations
- Alternative access thresholds $\bar{w}_t$ (top 5% or top 10%, nonlinear)
  - access weights: 4:2:1, for top 1, p95-99, p90-94

PB equity

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Top 1% wealth share (%), 2015	35.8	32.0	33.6	30.4	30.2	29.6
Change (percentage points)	12.6	8.8	10.4	7.2	7.0	6.4

Robustness: within-top inequality

- Within-top inequality target (top 1/top 10 share)

Table: Robustness test: Within-top inequality

	Data	Model	
		Baseline	Matching 1979's wealth share ratio
	(1)	(2)	(3)
Top 1% to top 10% wealth share ratio, 1979 (%)	35.5	45.1	35.5
Top 1% to top 10% wealth share ratio, 2015 (%)	48.9	55.6	48.3
Change (percentage points)	13.4	10.5	12.8

Policy experiments

Taxes matter because they change the size of the wedge, not just the return from aggregate innovation:

capital tax series

- Capital gains taxation
- Taxes on interest income and dividends
- R&D subsidies

	Baseline	fixed τ^p at 1979 value	fixed τ^i & τ^d at 1979 value	$\downarrow \tau^p$ to 0 for top 1%, by 2015	remove 10% R&D subsidy
	(1)	(2)	(3)	(4)	(5)
Top 1% wealth share (%), 1979	23.2	23.2	23.2	23.2	23.2
Top 1% wealth share (%), 2015	32.0	30.8	30.7	34.6	31.0
Change (percentage points)	8.8	7.6	7.5	11.4	7.8

Conclusion

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Innovation generates economic rents equivalent to $\approx 2\%$ of aggregate wealth p.a.

The most valuable innovations are increasingly generated in firms that most households cannot invest in: private firms

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The shift of innovation into private markets—and restricted access to the rents it generates—has been a first-order driver of rising top wealth inequality since 1975

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Appendix

Figure: Pre-tax r minus g

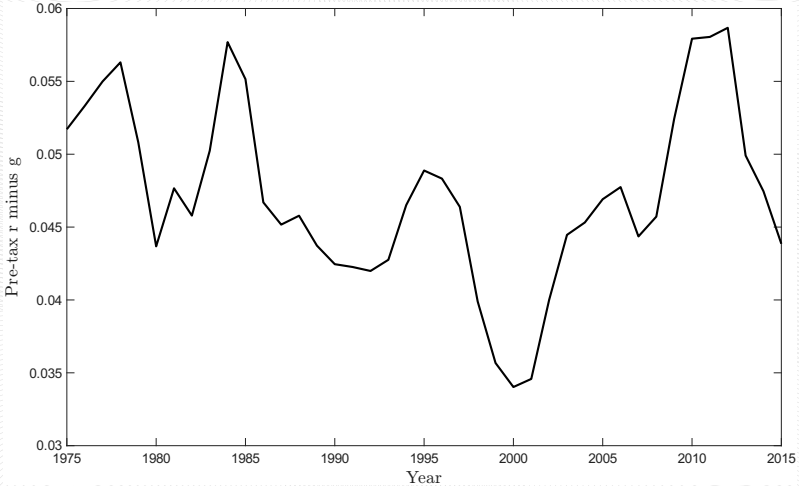

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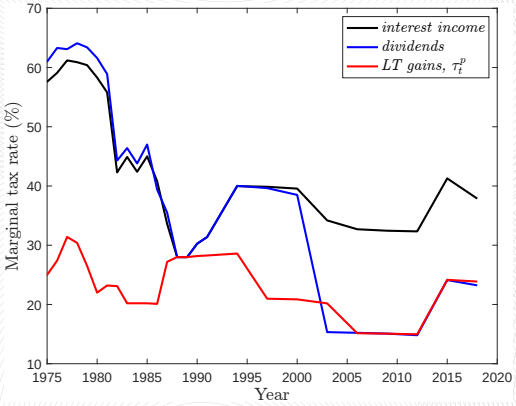
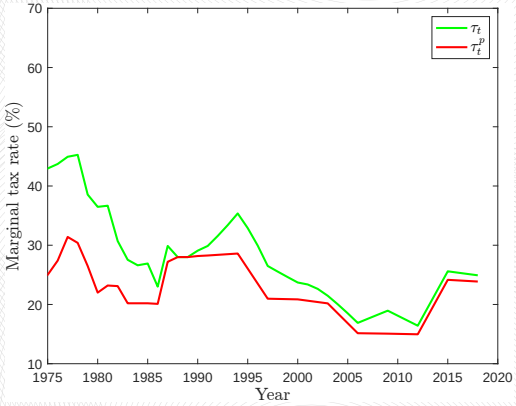
Figure: The top 1%'s marginal tax rates on capital income

Panel (a)



Panel (b)



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Innovation wealth change:

- Our measure of innovation wealth change: $V/W = 2.2\%$, on average (1975–2015)

- Romer (1990): a model of endogenous growth with technological change
- The steady-state value of newly created technologies is ≈ 0.1 output
  - via calibration: capital share of $1/3$, output growth of 3%, rental rate of 6.66%

- Using the wealth-output ratio of 5, delivers a similar figure $V/W \approx 2\%$

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Table: Private-business equity across the wealth distribution

	bottom 90%		90-94		95-99		top 1%	
SCF wave	prv-bus	assets	prv-bus	assets	prv-bus	assets	prv-bus	assets
1977	0.2 (3%)	8.6 (41%)	0.3 (5%)	2.6 (12%)	2.7 (45%)	5.6 (27%)	2.8 (47%)	4.3 (20%)
1983	0.5 (10%)	11.1 (38%)	0.7 (12%)	3.4 (12%)	1.6 (29%)	6.2 (21%)	2.8 (50%)	8.4 (29%)
1989	0.7 (10%)	15.3 (38%)	0.7 (9%)	5.0 (13%)	2.1 (27%)	9.1 (23%)	4.1 (54%)	10.9 (27%)
1992	0.7 (10%)	14.7 (39%)	0.5 (8%)	4.6 (12%)	1.9 (27%)	8.6 (23%)	3.8 (55%)	10.1 (27%)
1995	0.6 (8%)	16.1 (38%)	0.4 (5%)	4.8 (11%)	1.2 (16%)	8.1 (19%)	5.1 (70%)	12.8 (31%)
1998	0.8 (9%)	20.2 (37%)	0.5 (6%)	5.9 (11%)	2.0 (21%)	11.7 (22%)	5.8 (64%)	16.1 (30%)
2001	1.2 (10%)	25.1 (36%)	0.8 (7%)	8.3 (12%)	3.0 (25%)	16.6 (24%)	6.7 (57%)	20.5 (29%)
2004	1.3 (10%)	30.0 (37%)	0.8 (6%)	9.3 (11%)	3.1 (23%)	18.1 (22%)	8.3 (62%)	23.9 (29%)
2007	1.2 (6%)	33.4 (35%)	1.0 (5%)	10.0 (11%)	4.8 (26%)	23.5 (25%)	11.5 (62%)	27.9 (29%)
2010	1.2 (8%)	27.7 (33%)	1.0 (7%)	10.8 (13%)	3.4 (23%)	20.2 (24%)	9.0 (62%)	24.5 (29%)
2013	0.9 (6%)	27.1 (32%)	0.8 (5%)	9.8 (12%)	3.8 (26%)	21.2 (25%)	9.4 (63%)	26.3 (31%)
2016	1.2 (6%)	30.8 (29%)	1.2 (6%)	12.6 (12%)	4.8 (23%)	26.2 (25%)	13.7 (66%)	37.0 (35%)
2019	1.3 (6%)	33.1 (30%)	1.1 (5%)	12.5 (11%)	5.3 (24%)	28.6 (26%)	14.0 (65%)	37.1 (33%)

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Figure: Private-business equity, by net-wealth percentile

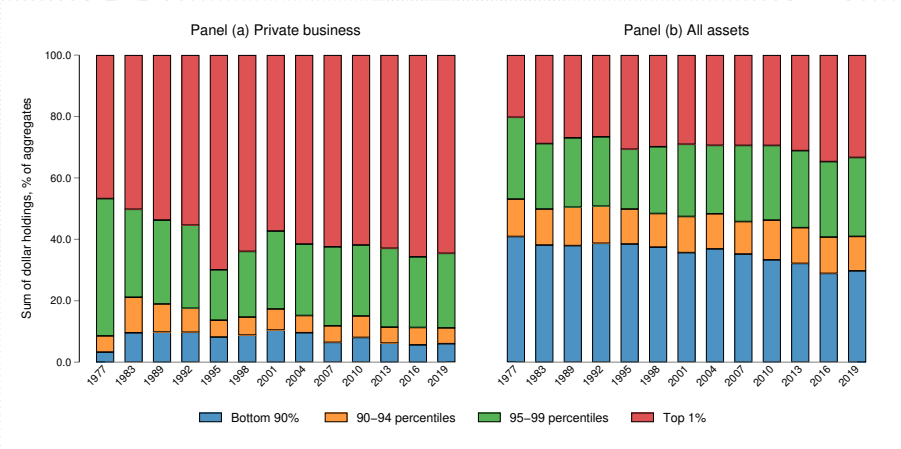

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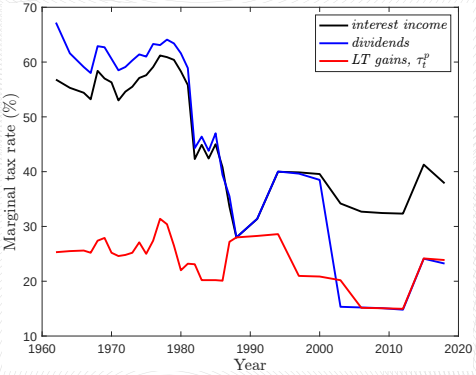
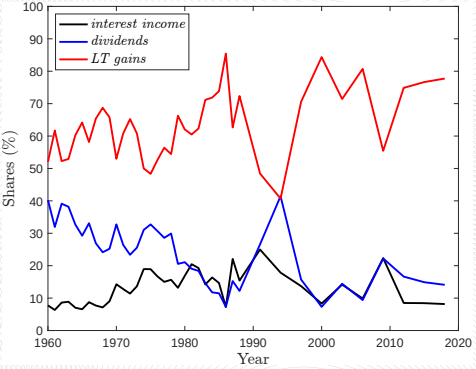
Figure: Marginal tax rates (Panel a) and capital income shares (Panel b) used in calculating the marginal tax rate on capital income

Panel (a)



Panel (b)



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