

Taxing the Rich I: Superstars and Human Capital

Lutz Hendricks

2026-04-15

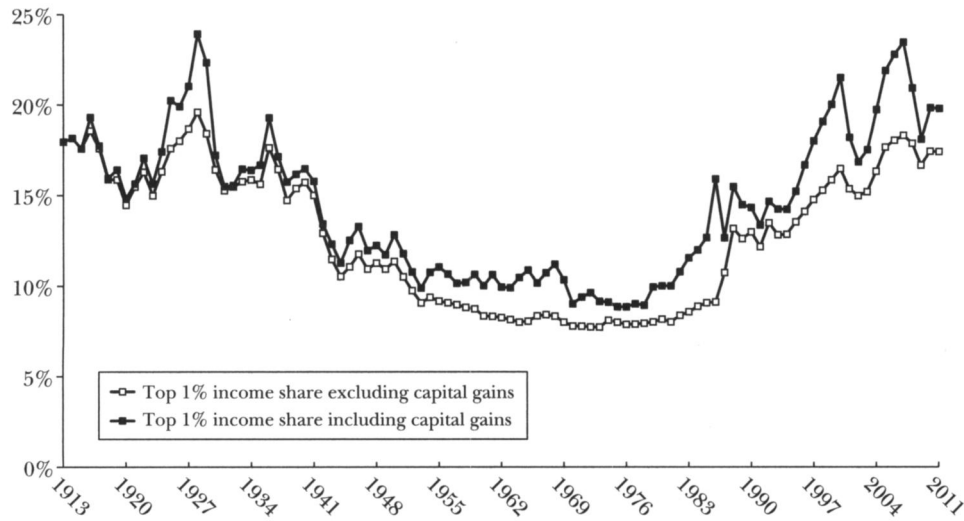
UNC Chapel Hill

Motivation

Rising Incomes at the Top

Figure 1

Top 1 Percent Income Share in the United States



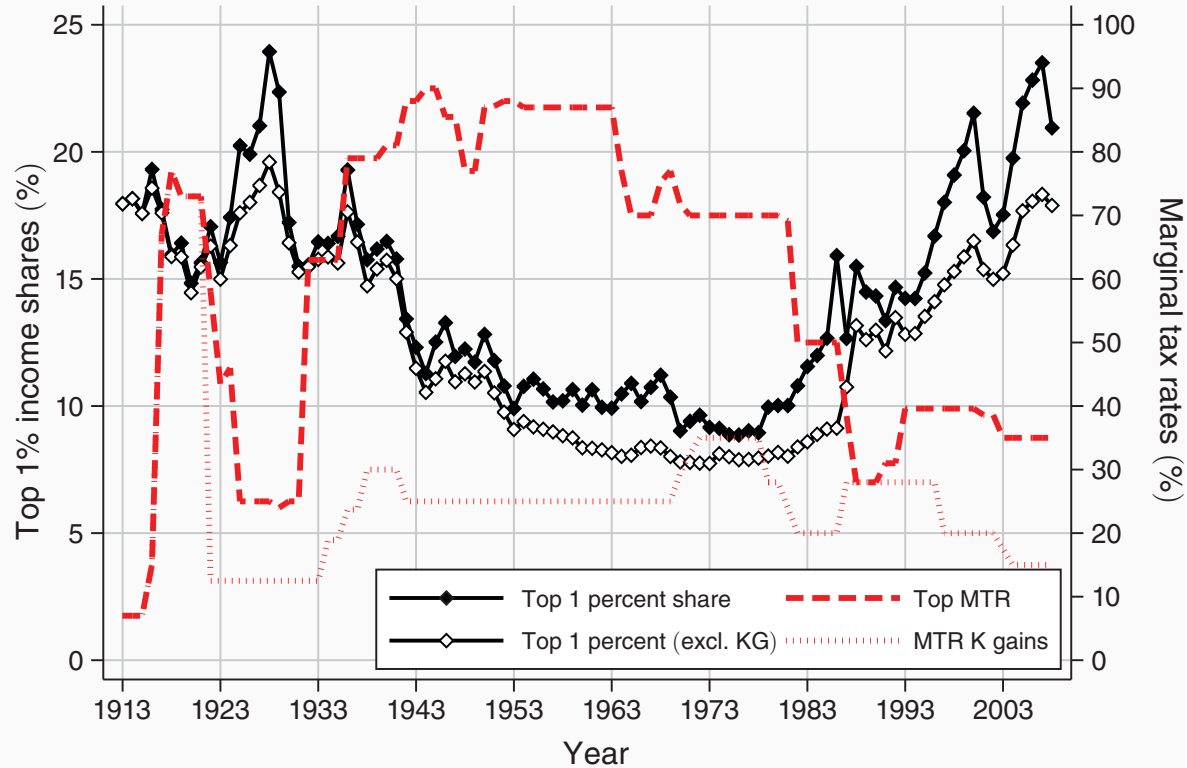
Source: Source is Piketty and Saez (2003) and the World Top Incomes Database.

Notes: The figure reports the share of total income earned by top 1 percent families in the United States from 1913 to 2011. Income is defined as pre-tax market income; it excludes government transfers and nontaxable fringe benefits. The figure reports series including realized capital gains (solid squares) and series excluding realized capital gains (hollow squares).

Alvaredo, Atkinson, Piketty, and Saez (2013)

Top Tax Rates and Top Income Shares

Panel A. Top 1 percent income shares and Top MTR



Top 1% income share and top tax rate are closely comoving over time.

1. What are the implications of taxing high incomes?
2. What is the optimal top marginal rate?
3. What is the revenue-maximizing top marginal rate?

Challenge: the answer depends on *where income inequality comes from*.

We need structural models of the earnings distribution.

Modeling Earnings

Model	Source of top earnings	Optimal rate
Superstar shocks	Luck	High (79%)
Human capital	Investment	Lower (49%)
Entrepreneurs / ideas	Innovation	Much lower (22%)

Approach I: Superstar Earnings States

The Modeling Challenge

Huggett (1996):

- Match the earnings distribution reasonably well
- Fail to match wealth concentration (top 5%, top 1%)

Why?

- Earnings processes estimated from panel data (e.g., PSID) miss the top 1%
- At the time, **no panel data** that cover the rich

Can we match both the earnings *and* wealth distribution in a “standard” model?

Key decision:

- Only use cross-sectional data.
- Survey of Consumer Finances (SCF)

Model Features

The obvious approach would be:

- Take an off-the-shelf model, such as Huggett (1996)
- Search for an earnings process that matches
 - the cross-sectional earnings distribution and
 - the cross-sectional wealth distribution.

Computational challenge:

- Need to compute 55 value functions for each candidate earnings process.

The solution: **stochastic aging**

- aka “perpetual youth” (but with a twist)

Stochastic Aging

A computational trick to avoid the curse of dimensionality.

There are only two “ages”: **work and retirement**.

- In each period, workers age with a constant probability.
- So we only have 2 value functions.

When old

- die with constant probability
- replace with a child who inherits assets
- **perfect altruism** → households effectively live forever

The downside

- Some households live for very short or long periods
- Longevity risk

Household Problem

$$v(s, a) = \max_{c, \ell, l} u(c, \ell - l) + \beta \sum_{s' \in \mathcal{S}} \Gamma_{ss'} v(s', a'(z))$$

State s encodes productivity and “age”

Budget constraint:

$$c + z = y - \tau(y) + a$$

$$y = a \cdot r + w \cdot e(s) \cdot l + \omega(s)$$

Next-period assets:

$$a'(z) = \begin{cases} (1 - \tau_E(z)) \cdot z & \text{if death (estate tax)} \\ z & \text{otherwise} \end{cases}$$

The Earnings Process

TABLE 5
RELATIVE ENDOWMENTS OF EFFICIENCY LABOR UNITS, $e(s)$, AND THE
STATIONARY DISTRIBUTION OF WORKING-AGE HOUSEHOLDS, γ_ε^*

	$s = 1$	$s = 2$	$s = 3$	$s = 4$
$e(s)$	1.00	3.15	9.78	1,061.00
γ_ε^* (%)	61.11	22.35	16.50	.0389

Lower 3 states: “look like” something from the PSID (but persistence is high)

Top state: very high earnings, very transitory

Intuition: households “win the lottery” once every 250 years.

TABLE 7
DISTRIBUTIONS OF EARNINGS AND OF WEALTH IN THE UNITED STATES AND IN THE
BENCHMARK MODEL ECONOMIES (%)

ECONOMY	GINI	QUINTILE					TOP GROUPS (Percentile)		
		First	Second	Third	Fourth	Fifth	90th– 95th	95th– 99th	99th– 100th
A. Distributions of Earnings									
United States	.63	–.40	3.19	12.49	23.33	61.39	12.38	16.37	14.76
Benchmark	.63	.00	3.74	14.59	15.99	65.68	15.15	17.65	14.93
B. Distributions of Wealth									
United States	.78	–.39	1.74	5.72	13.43	79.49	12.62	23.95	29.55
Benchmark	.79	.21	1.21	1.93	14.68	81.97	16.97	18.21	29.85

Why does the model generate very wealth rich households?

The paper shows that it is **possible** to match earnings and wealth concentration.

It does **not** show that the earnings process is **realistic**.

- The process is “cooked” to match distributions
- No information on persistence is used in calibration
- The top state is a reduced form — what generates it?

The Castaneda approach has been widely adopted.
But results are sensitive to the made-up earnings process.

De Nardi, Fella, Paz-Pardo (2020)

Can a standard Huggett-style model match the top of the wealth distribution when we impose a rich earnings process based on administrative data?

Guvenen et al. (2016)

- estimate earnings from tax return data
- find age-dependent, non-normal shocks
- low persistence for young and low earners

Richer Earnings Processes

Feed the earnings process into a standard life-cycle incomplete-markets model.

- Not a computational problem ...

The cross-sectional wealth distribution looks just like Huggett (1996).

But:

- It fits the age profile of *consumption inequality* much better
- Roughly halves the welfare cost of earnings risk

Intuition:

- Persistence depends on age and on previous earnings
- Shocks to young and low earners look less permanent → easier to self-insure

Question

What is the welfare-maximizing top marginal tax rate?

Model: OLG

- Uninsurable idiosyncratic income risk (including superstar shocks)
- Endogenous labor supply
- Savings with borrowing constraints
- General equilibrium

Key assumption: **being rich is largely luck.**

- Top earnings come from rare, large productivity shocks
- Not from investment

K&K: Model Elements

Element	Why
OLG (finite lives, J periods)	Lifecycle savings \rightarrow realistic wealth distribution
Two education groups ($s \in \{n, c\}$)	Match college/non-college earnings gap
Fixed effect α	Persistent within-group heterogeneity
AR(1) productivity shocks η	Standard earnings risk (from PSID)
Two “superstar” states $\eta_{s,6}, \eta_{s,7}$	Match top 1% earnings and wealth (Castaneda)
Endogenous labor supply	Key behavioral margin for tax policy
Borrowing constraint ($a' \geq 0$)	Insurance role for taxes
CRS production, competitive firm	GE: taxes affect K, r, w

Optimal top marginal rate $\approx 79\%$

Revenue-maximizing rate $\approx 85\%$

Welfare gains come from **insurance, not redistribution**:

- Ex-ante rich and poor households gain from high taxes.
- Households are unlikely to become superstars
- Marginal utility when very rich is low
- They benefit from lower average taxes funded by top-bracket revenue

Key calibration feature:

The superstar states are **very transitory**

Implications:

1. Labor supply of the very rich does not respond much to taxes.
Strong incentive to work in transitory high-wage state.
2. High insurance value of taxes on the rich.
Most households never reach superstar earnings.
They want insurance against that possibility.

Almost the same model as Kindermann-Krueger.

But the optimal top rate is only **37%**.

Key difference: **more persistent earnings shocks**.

- In K&K: being rich is **transitory** luck
 - high insurance value
 - high optimal rate
- In G&V: being rich is **persistent** (reflects ability)
 - less insurance value, more efficiency cost
 - lower optimal rate

The optimal rate is very sensitive to the earnings process.
But the earnings process is a reduced form — not disciplined by a structural model of how people become rich.

Note: Today, we have better (administrative) data and know quite precisely what the earnings process looks like.

Discussion: What Is Missing?

Two limitations of the superstar approach:

1. **Being rich comes from investment.**

Top earners invested in skills, built businesses, or developed ideas.
Taxing them distorts those investments.

2. **The earnings process is made up.**

It is reverse-engineered to match cross-sectional distributions,
not disciplined by micro evidence on earnings dynamics or how people reach the
top.

This motivates models where the earnings distribution is generated **endogenously**.

Approach 2: Human Capital

Top earners are not lottery winners. They *invested* in becoming rich.

- Years of education
- On-the-job training and skill accumulation
- Career choices

If progressive taxes discourage human capital investment, they

- reduce pre-tax earnings at the top
- shrink the tax base
- have larger efficiency costs than the superstar models suggest

The Ben-Porath Model

Agents live for J periods.

They are endowed with

- initial human capital h
- learning ability a

Human capital is accumulated by spending time learning (l)

Period earnings are $w_j h_j (1 - l_j)$

- human capital raises the effective wage
- learning time reduces hours worked

Ben-Porath Problem

$$\max_{\{l_j\}} \sum_{j=1}^J \frac{w_j h_j (1 - l_j)}{(1 + r)^{j-1}}$$

Human capital evolves as:

$$h_{j+1} = h_j(1 - \delta) + a(h_j l_j)^\alpha$$

where $\alpha \in (0, 1)$, and δ is the depreciation rate.

Agents invest in human capital when young

- as they get older, they payback period becomes shorter

Higher-ability agents invest more in human capital:

- higher marginal product of study time

This produces **fanning out** of the earnings distribution over the lifecycle.

Key insight:

Differences in *learning ability* generate increasing earnings dispersion with age — not luck, but investment.

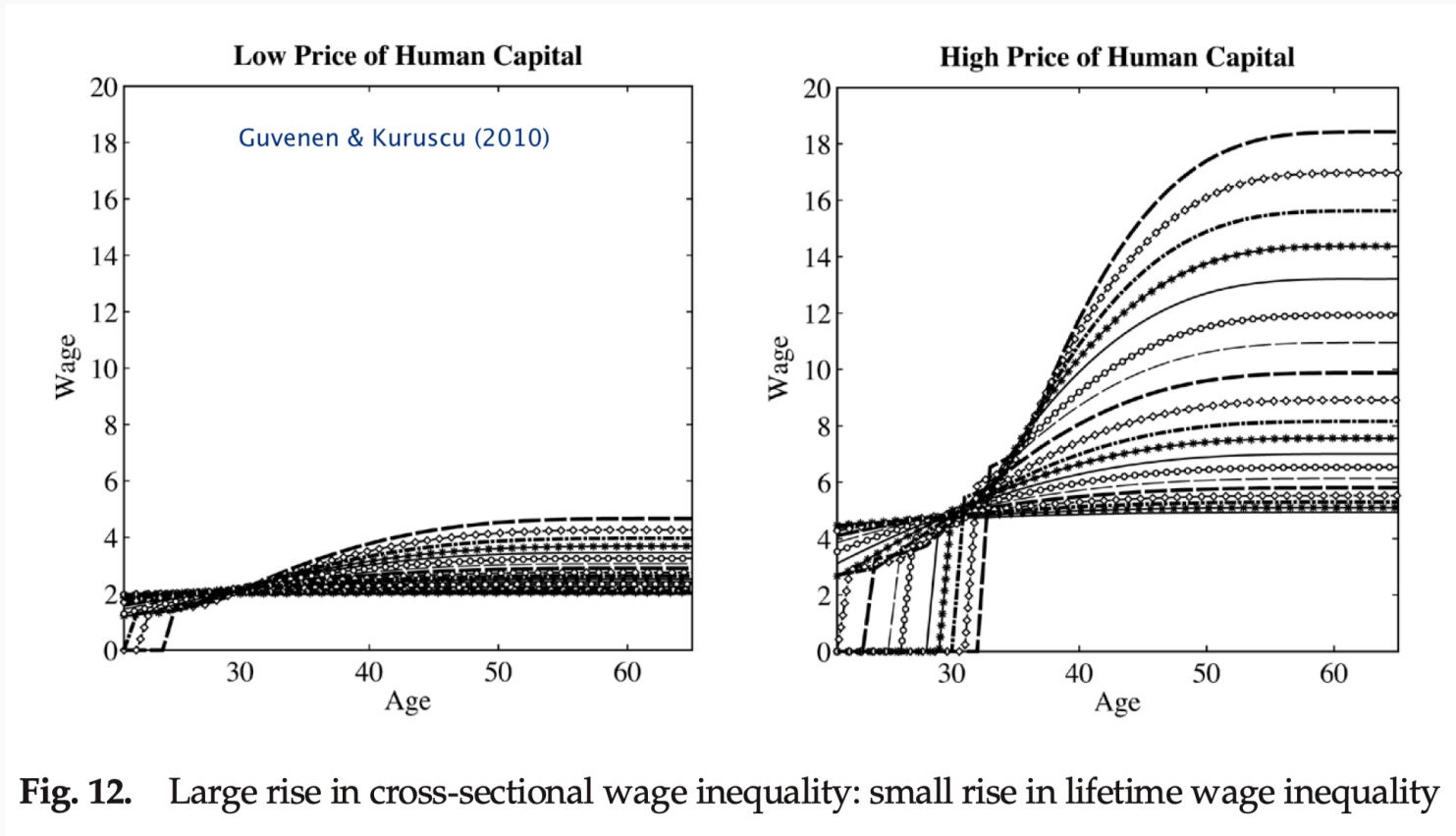


Fig. 12. Large rise in cross-sectional wage inequality: small rise in lifetime wage inequality

Example of fanning out of wage distribution with age.

Question

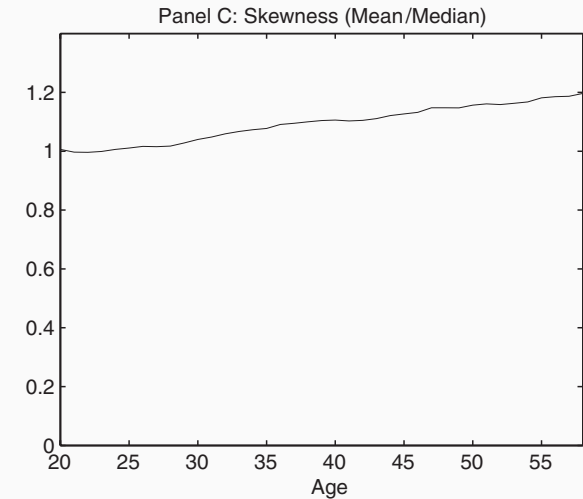
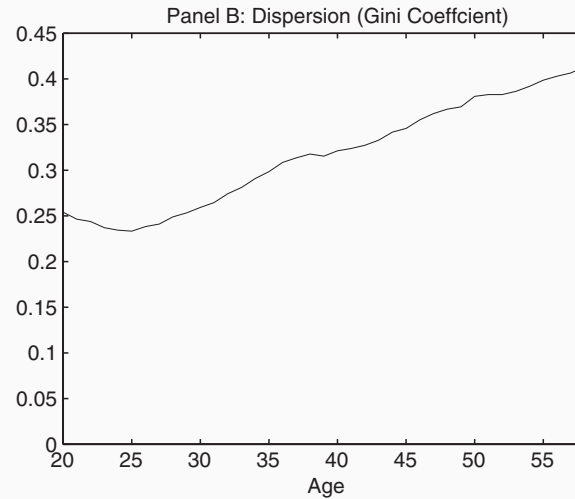
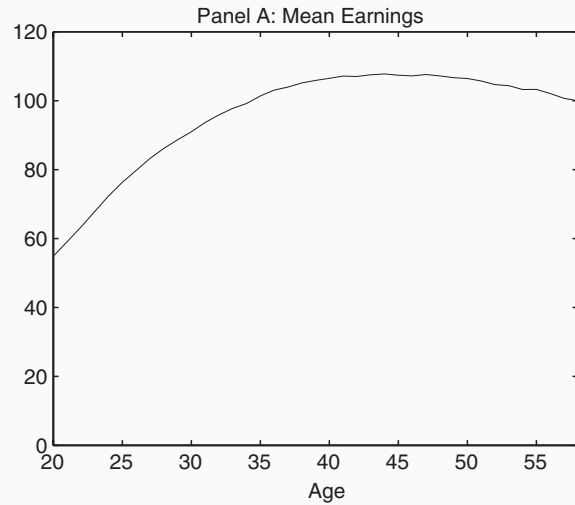
Can the Ben-Porath model match the dynamics of the US earnings distribution over the lifecycle?

Data: PSID, US males, ages 23–58 (1969–1992).

Three stylized facts:

1. Mean earnings increase, then flatten
2. Earnings *dispersion* (Gini) increases with age
3. Earnings *skewness* (mean/median) increases with age

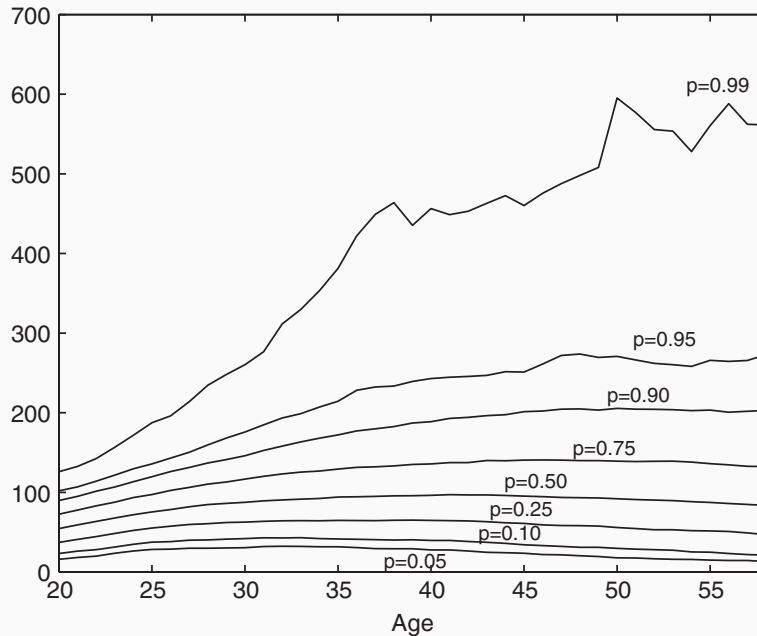
HVY: Earnings Facts



All three moments increase with age. Gini: 0.24 at 23 \rightarrow 0.41 at 55.

Huggett, Ventura, and Yaron (2006), Fig. 1

HVY: Earnings Percentiles



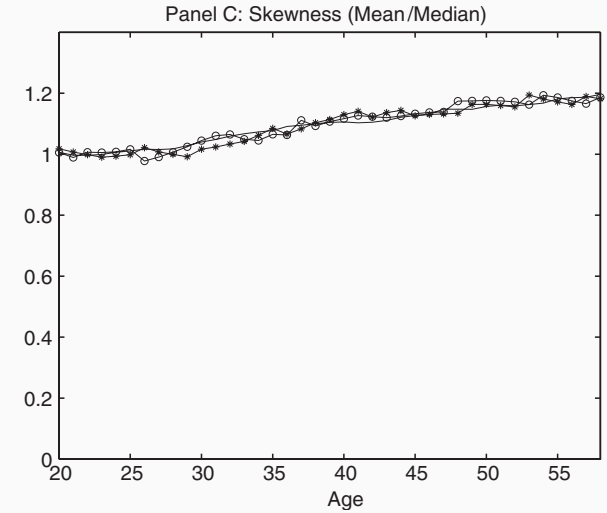
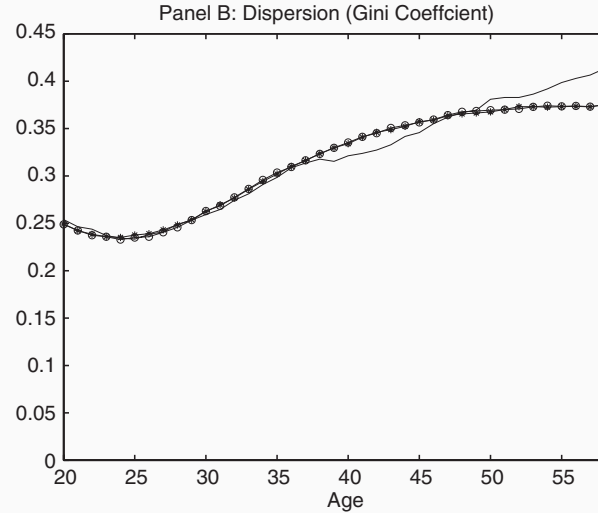
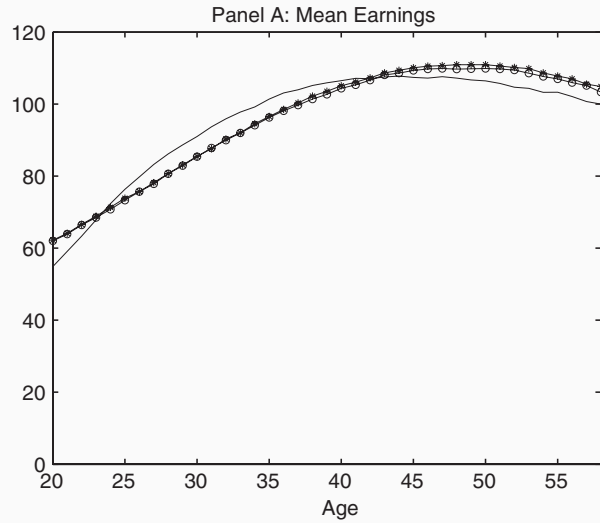
Earnings percentiles fan out over the lifecycle.

The top percentiles ($p=0.95$, 0.99) grow much faster than the median.

The bottom percentiles are essentially flat.

Huggett, Ventura, and Yaron (2006), Fig. 2

HVY: Model Fit



Solid: data. Markers: model.

Mean absolute deviation: 2.5–3.5%.

Huggett, Ventura, and Yaron (2006), Fig. 4

HVY: Why Does It Work?

The model replicates the facts from the right initial distribution of h_1 and a :

- High- a agents: steep earnings profiles (invest early, earn later)
- Low- a agents: flat earnings profiles

This fanning out generates the observed increase in dispersion and skewness.

Variance decomposition:

Learning ability accounts for > 60% of the variance in the present value of earnings.

HVY: Limitations

The model is **deterministic**

- no shocks to earnings or human capital.

In the data: earnings growth rates are *negatively* autocorrelated (≈ -0.34)

- In the model: growth rates are *positively* autocorrelated

The Ben-Porath model matches cross-sectional earnings dynamics well.

But it needs shocks to match *individual* earnings persistence.

→ Badel, Huggett, and Luo (2020) add shocks to this framework.

Question

What is the revenue-maximizing top tax rate when top earners invest in human capital?

Model:

- OLG with Ben-Porath human capital
- Heterogeneous learning ability *and* initial human capital
- Progressive taxation (piecewise-linear, fitted to US TAXSIM)
- General equilibrium

BHL: Household Problem

An agent at age j with human capital h_j and assets k_j chooses consumption c_j , work time l_j , learning time s_j :

$$\max E \left[\sum_{j=1}^J \beta^{j-1} u(c_j, l_j + s_j) \right]$$

Budget constraint:

$$c_j + k_{j+1} \leq e_j + k_j(1 + r) - T_j(e_j, c_j, rk_j)$$

where labor earnings are $e_j = wh_j l_j$ before retirement, zero after.

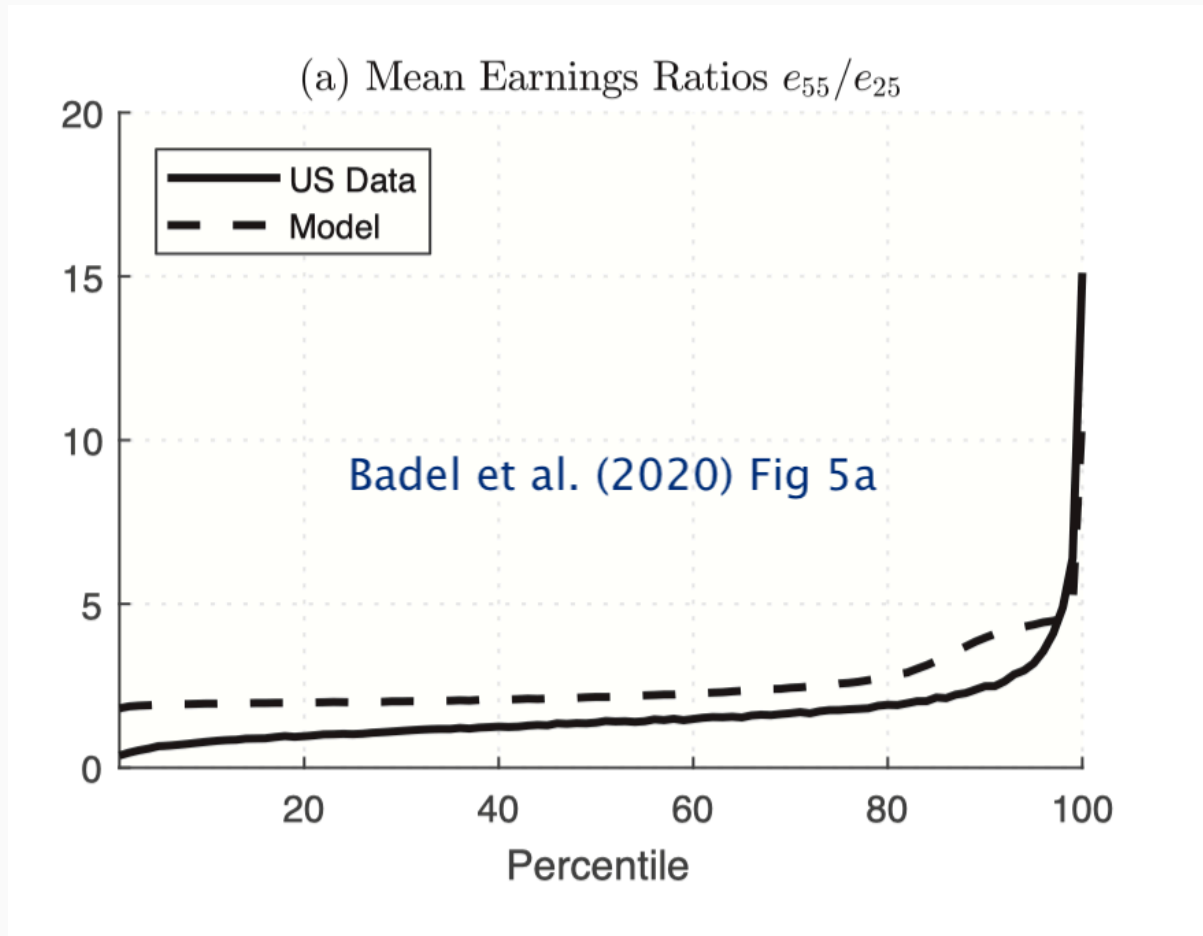
Human capital evolves as (Ben-Porath):

$$h_{j+1} = \exp(z_{j+1}) \left[h_j + a(h_j s_j)^\alpha \right]$$

- a : immutable learning ability (heterogeneous)
- z_{j+1} : idiosyncratic productivity shock

Time constraint: $0 \leq l_j + s_j \leq 1$

Ben-Porath Mechanism



Data:

High lifetime earnings have steep wage profiles.

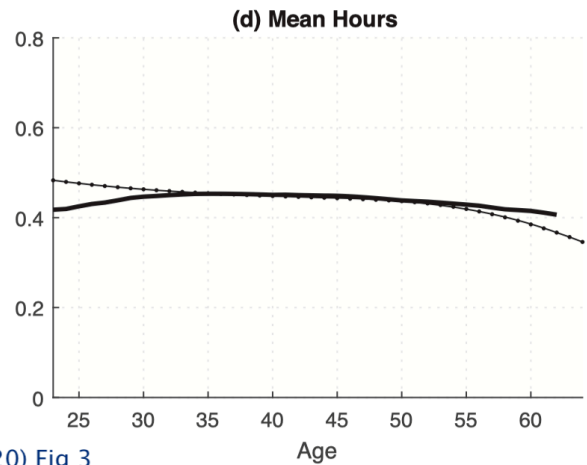
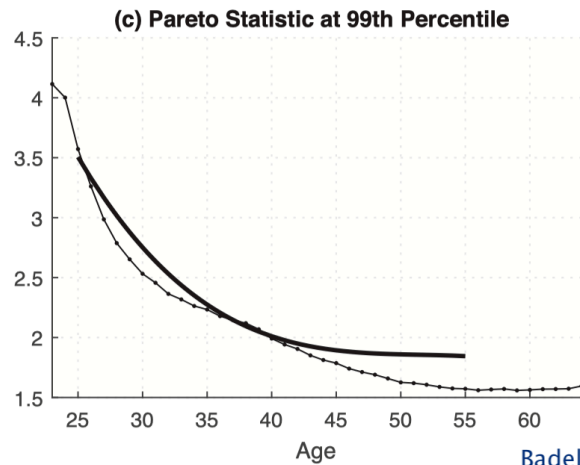
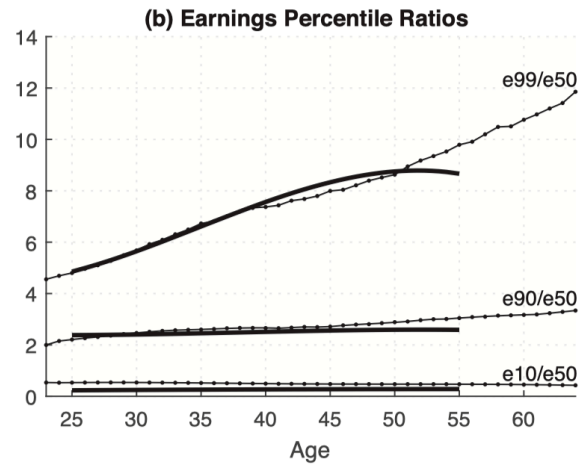
High- α agents invest more
→ steep lifecycle earnings profiles

→ become top earners.

Closing the model:

- CRS production: $Y = F(K, L)$ with competitive factor prices w and r
- Aggregates K and L : weighted sums of individual asset and labor decisions across ages
- Government collects progressive income taxes, consumption taxes, and capital taxes; funds a lump-sum transfer
- Government budget balance: $G = T$ (spending equals tax revenue)

BHL: Model Fit



Badel et al (2020) Fig 3

BHL: Key Features

What sets BHL apart from Kindermann-Krueger:

Feature	KK	BHL
Source of top earnings	Luck (superstar shock)	HC investment
Skills	Exogenous	Endogenous (h_j)
Key margin	Labor supply	Learning time s_j
Tax distortion	Work less today	Invest less \rightarrow earn less forever

The tax system is fitted to US TAXSIM marginal rates.

- Piecewise-linear marginal rate schedule
- Top rate $\tau = 0.422$ at the 99th percentile of income

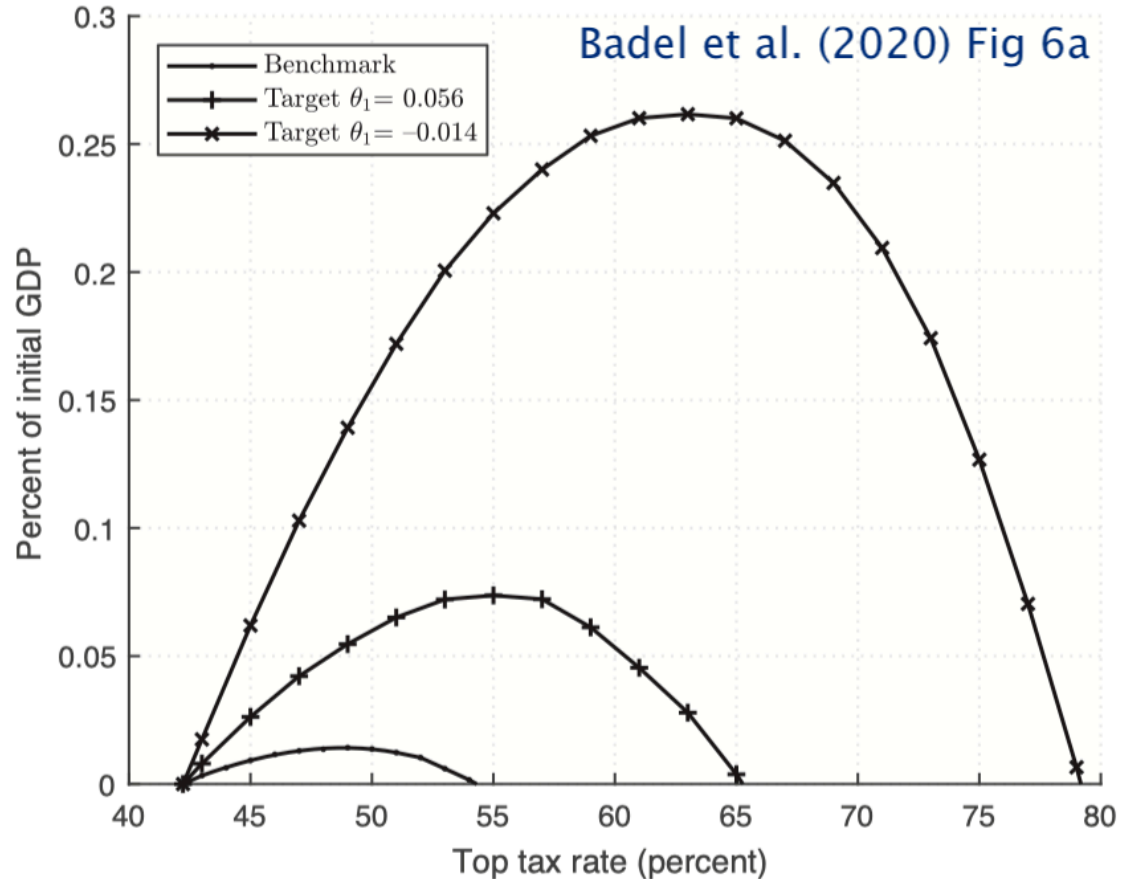
Policy experiment:

- Permanently raise the top marginal rate τ
- Hold government spending G fixed
- Rebate extra revenue as a lump-sum transfer
- Compare steady states

Revenue-maximizing top rate: **49%**

Laffer Curve

(a) Laffer Curves



Laffer Curve: **very flat**

Max revenue raised
< 0.1% of GDP

θ_1 : governs labor supply
elasticity

Comparison with Exogenous Human Capital

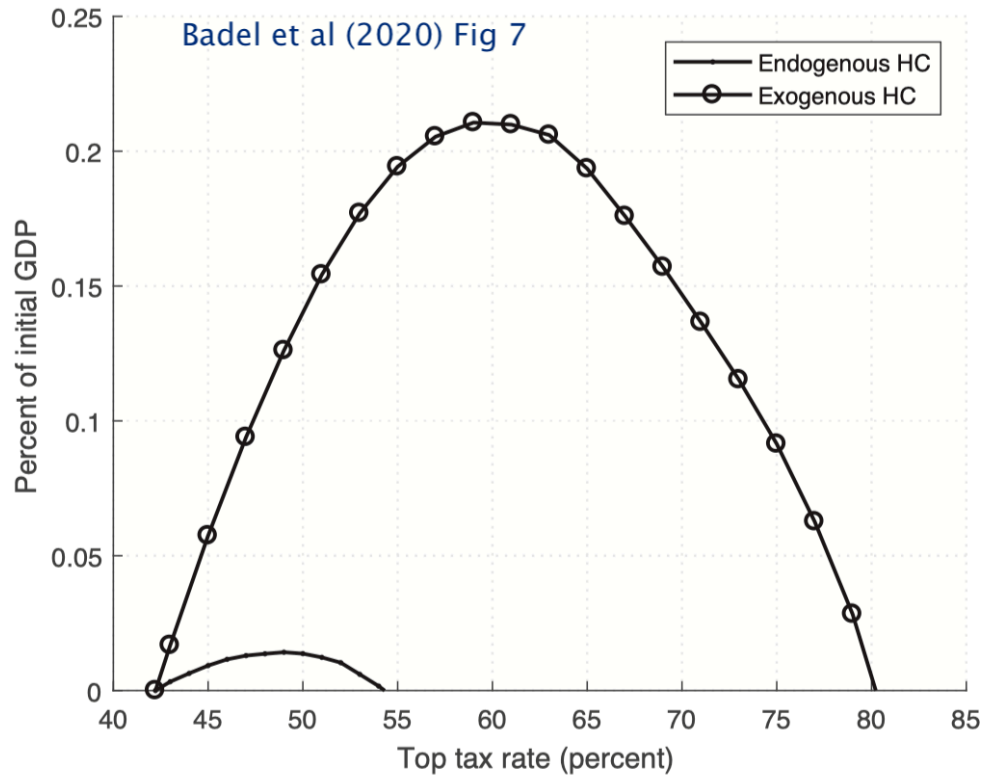


Fig. 7. *Laffer Curves.*

Human capital flattens the Laffer curve

Taxes distort human capital investment **before** the rich get rich.

- Cost of learning: forgone earnings (taxed at lower rates)
- Benefit of learning: higher future earnings (taxed at the top rate)
- Raising the top rate cuts the benefit without changing the cost
- The distortion cumulates over the lifecycle

Key new idea:

Distorting investment in productivity can have much larger output effects than distorting hours worked.

Digression: Guvenen, Kuruscu, and Ozkan (2014)

Same Ben-Porath framework, different question:

Question

Why is wage inequality higher in the US than in continental Europe?

- Same preferences and technology across countries; only tax systems differ
- Tax progressivity explains 50% of the US-Europe wage inequality gap
- And 84% of the upper-tail gap (90-50)
- Validation: US lifecycle wage growth = 0.36 log points (age 25–55) vs. 0.21 in Germany

Progressive taxes don't just redistribute. They compress the *pre-tax* earnings distribution by discouraging investment.

What are the implications of taxing the rich?

1. **Superstar models**

- Top earners are lottery winners
- Taxes distort their labor supply
- Optimal top rate can be very high (**79%** in K&K)

2. **Human capital models**

- Top earners invest in skills
- Taxes distort their investment decisions
- Optimal top rate is much lower (**49%** in BHL)

What are we missing?

What is the main (popular) argument against taxing the rich?

They do something socially useful.

- They start businesses and create “good” jobs.
What actually are good jobs?
How come economists never talk about them?
- They develop new ideas and technologies.
Knowledge spillovers → don't tax them.

References

References

- Alvaredo, F., A. B. Atkinson, T. Piketty, and E. Saez (2013). “The Top 1 Percent in International and Historical Perspective.” *Journal of Economic Perspectives*, 27(3), 3–20.
- Badel, A., M. Huggett, and W. Luo (2020). “Taxing Top Earners: A Human Capital Perspective.” *The Economic Journal*, 130(629), 1200–1225.
- Castañeda, A., J. Díaz-Giménez, and J.-V. Ríos-Rull (2003). “Accounting for the U.S. Earnings and Wealth Inequality.” *Journal of Political Economy*, 111(4), 818–857.
- De Nardi, M., G. Fella, and G. Paz-Pardo (2020). “Nonlinear Household Earnings Dynamics, Self-Insurance, and Welfare.” *Journal of the European Economic Association*, 18(2), 890–926.
- Guner, N., M. Lopez-Daneri, and G. Ventura (2016). “Heterogeneity and Government Revenues: Higher Taxes at the Top?” *Journal of Monetary Economics*, 80, 69–85.
- Guvenen, F., B. Kuruscu, and S. Ozkan (2014). “Taxation of Human Capital and Wage Inequality: A Cross-Country Analysis.” *Review of Economic Studies*, 81(2), 818–850.
- Huggett, M. (1996). “Wealth Distribution in Life-Cycle Economies.” *Journal of Monetary Economics*, 38, 469–494.
- Huggett, M., G. Ventura, and A. Yaron (2006). “Human Capital and Earnings Distribution Dynamics.” *Journal of Monetary Economics*, 53(2), 265–290.

- Kindermann, F. and D. Krueger (2022). “High Marginal Tax Rates on the Top 1%? Lessons from a Life-Cycle Model with Idiosyncratic Income Risk.” *American Economic Journal: Macroeconomics*, 14(2), 319–366.