Huggett (1996)

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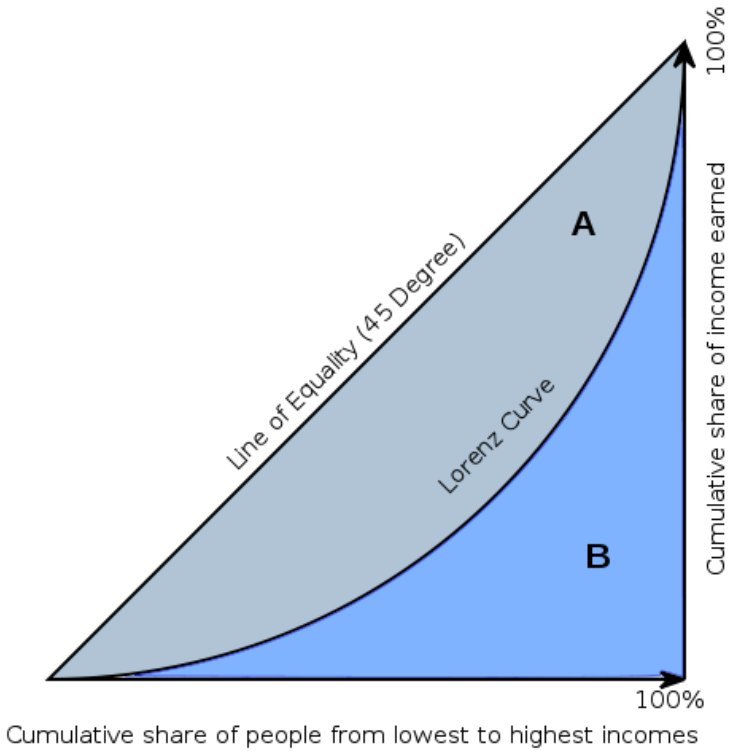
The Question

- We study a classic paper on wealth inequality as an example of a Bewley model
- Huggett (1996)
- The question
  - to what extent can a standard life-cycle model with idiosyncratic earnings risk account for the observed concentration of wealth?

Data: U.S. Wealth Distribution

- Top 1% hold 28% of total wealth
- Top 5% hold half
- Bottom 40% hold essentially nothing
- Gini: 0.72

Gini Coefficient

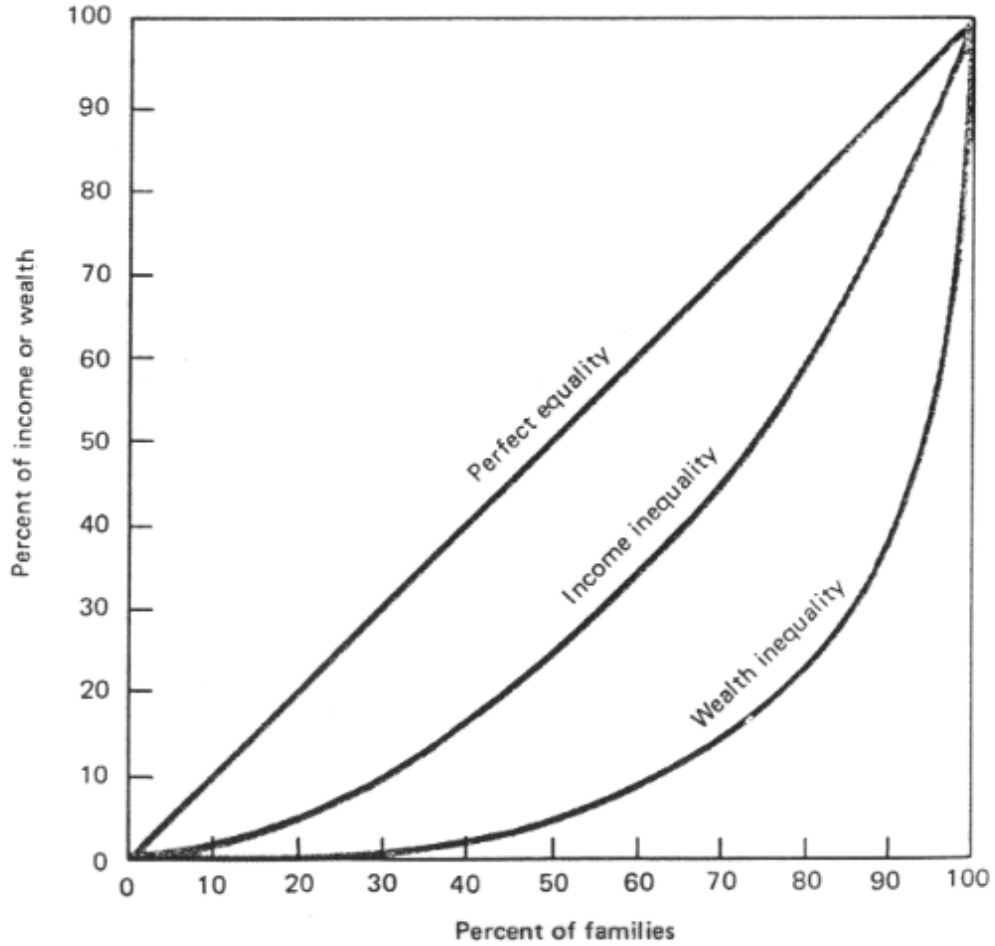


Source: Wikipedia

Gini: measure of inequality
Gini = 0: perfect equality
Gini = 1: perfect inequality
Measured by the area above the Lorenz curve
Gini = A / (A+B)

Data: U.S. Wealth Distribution

Figure 2-5
Lorenz curves on wealth and income inequality, 1983. These curves are estimates from data presented in Table 2-7.



Source: Kirbo

The Model

- Demographics
  - in each period 1 unit mass of agents are born
  - they live at most N periods
  - exogenous survival probabilities s_j
- Preferences

$$\mathbb{E}\sum_{t=1}^{N}\beta^t\left(\prod_{j=1}^{t}s_j\right)u(c_t) \tag{1}$$

The Model

- Endowments
  - an agent of age t is endowed with $e(z,t)$ units of work time
  - z is a Markov productivity shock
- Technology

$$Y = AK^{\alpha}L^{1-\alpha} \tag{2}$$

- Government
  - tax income rate rate τ
  - social security tax θ pays old age transfers b
  - lump-sum transfers T redistribute accidental bequests
- Markets
  - labor rental (wage w)
  - capital rental (interest rate r)
  - good (price 1)
  - risk free bonds (interest rate r)

Household Problem

- Individual state: $x = (a, z)$
- Bellman

$$V(x,t) = \max_{c,a'} u(c) + \beta s_{t+1} \mathbb{E} V(a', z', t+1) \tag{3}$$

subject to

$$c + a' = a(1 + r[1-\tau]) + (1-\theta-\tau)e(z,t)w + T + b_t \tag{4}$$

$$a \geq \underline{a} \tag{5}$$

- $V(x, N+1) = 0$

Equilibrium

- Focus on stationary equilibria.
- State variable: joint distribution of (a,z) for each t
- Density: $\psi_t(B)$ where B is a set of states
- Transition function: $P(x,t,B) = \Pr(x' \in B | x,t)$.
- Stationarity of distribution requires

$$\psi_t(B) = \int_X P(x,t-1,B) d\psi_{t-1} \tag{6}$$

Stationary Equlibrium

- Objects:
  - household: $c(x,t), a(x,t), V(x,t)$
  - prices: r, w
  - policies: τ, θ, b_t, T, G
  - aggregates: K, L
- Equilibrium conditions
  - households "maximize"
  - firm first-order conditions
  - government budget constraint

$$G = \tau(rK + wL) \tag{7}$$

  - social security budget constraint

$$\theta wL = b \sum_{t=R}^{N} \mu_t \tag{8}$$

  - market clearing
  - stationarity

Market Clearing

- Goods

$$F(K,L)+(1-\delta)K = G+\sum_t \mu_t \int_X [c(x,t)+a(x,t)]d\psi_t \qquad (9)$$

- Capital

$$K = \sum_t \mu_t \int_X a(x,t)d\psi_t \qquad (10)$$

- Labor

$$L = \sum_t \mu_t \int_X e(z,t)d\psi_t \qquad (11)$$

Calibration

- Choose model parameters to target objects other than the wealth distribution.
- Targets include: capital share, ...
- some parameters are set based on outside evidence: preferences, tax rates, ...

Main Result

	Fraction of wealth held		
Percentile	1	5	20
Data	28	49	75
Model	11	33	75

Models of this kind fail to account for wealth concentration at the top

What Goes Wrong?

1. The rich do not have an **incentive to save**
   Possible solutions: entrepreneurship, bequests
   Quadrini (1999), Cagetti and Nardi (2006)
2. The only **source of income** is earnings
   The rich don't earn enough to accumulate as much wealth as in the data
   Possible solutions: entrepreneurship, bequests
3. Earnings and wealth are too highly **correlated**
   Hendricks (2007)

References I

Cagetti, M. and M. D. Nardi (2006): "Entrepreneurship, Frictions, and Wealth," *Journal of Political Economy*, 114, 835–870.

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Quadrini, V. (1999): "The Importance of Entrepreneurship for Wealth Concentration and Mobility," *Review of Income and Wealth*, 45, 1–19.