Wealth Distribution and Entrepreneurship

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Contents

Introduction

Entrepreneurs have large incomes and hold a large share of total wealth.
Can a life-cycle model with self-employment opportunities account for wealth concentration?

Findings:

- Models easily account for the cross-sectional concentration of wealth.
- Models imply large amounts of wealth inequality within lifetime income deciles.

But there are problems:

- Too little wealth inequality among workers or within lifetime *income* deciles.

Data

Entrepreneurs:

- A person who own a business or who reports being self-employed. All other persons are workers.
- About 14% are entrepreneurs.

Among the richest households, most are entrepreneurs.

TABLE 3
FRACTION (%) OF ENTREPRENEURS (ACCORDING TO VARIOUS DEFINITIONS) IN A GIVEN WEALTH PERCENTILE OF THE OVERALL U.S. WEALTH DISTRIBUTION

	WEALTH PERCENTILE, TOP			
	1%	5%	10%	20%
Business owners or self-employed	81	68	54	39
All business owners	76	62	49	36
Active business owners	65	51	42	30
Self-employed	62	47	38	26
Self-employed business owners	54	39	32	22

Source: Cagetti and Nardi (2006)

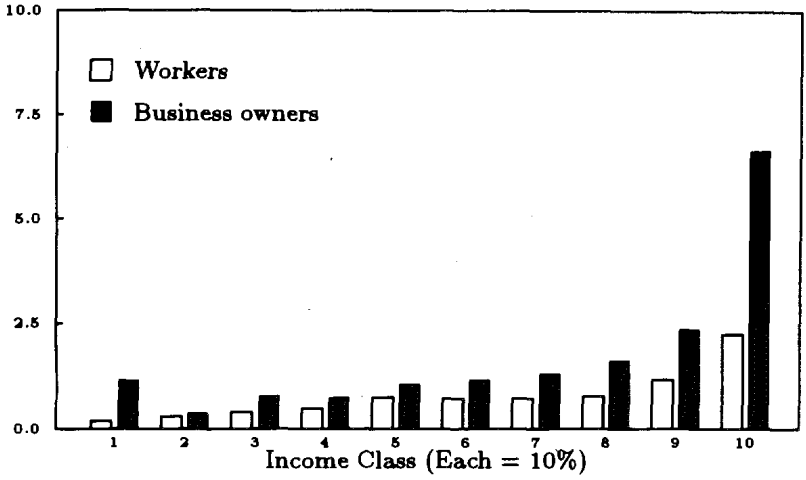
Entrepreneurs are rich on average

TABLE 4
MEDIAN AND MEAN NET WORTH (in Thousands of Dollars) FOR VARIOUS GROUPS OF PEOPLE

	Median	Mean
Whole population	47	189
Business owners or self-employed	172	599
All business owners	205	695
Business owners but not active management	293	768
Business owners not self-employed	179	470
All self-employed	169	665
Self-employed (active) business owners	265	829
Self-employed and not business owners	36	224

Source: Cagetti and Nardi (2006)

Wealth distribution among entrepreneurs:



Source: Quadrini (1999)

Many entrepreneurs are not rich (though that depends to some extent on the definition of entrepreurship)

Open question:

- Are the rich rich because they are entrepreneurs?
- Or are the rich entrepreneurs because they are rich?

Data question:

- What are the sources of lifetime income for the rich?

The Simplest Model of Entrepreneurship

Based on Cagetti and Nardi (2006)
Other models: Quadrini (1999), Cagetti and De Nardi (2009)

Framework:

- A life-cycle model with stochastic ageing and intended bequests.
- Self-employment opportunities arrive at random.
- In each period, households decide whether to be worker or entrepreneur.
- Borrowing constraints limit investment in entrepreneurial opportunities.

Households

Two life phases: work and retirement.
Stochastic transition between phases:

- work to retirement: π_y.
- retirement to death: π_o.

Dying agents are replaced by their children.

Timing within periods

- Enter the period with wealth a_t.
- If retired: receive pension income p_t.
- If not retired: Draw a labor endowment y_t and a self-employment productivity θ_t.
- Decide whether to be a worker or an entrepreneur.
- Choose consumption c_t and saving a_{t+1}.

As a worker: Receive labor income $(1-\tau)\, w\, y$.
As an entrepreneur:

- Decide how much to invest (k) subject to a borrowing constraint.
- Immediately receive output $g(k,\theta) = (1-\delta)\, k + \theta\, k^{\nu}$.

Households solve

$$\max E \sum_{t=0}^{\infty} \beta^t \, u(c_t)$$

subject to

$$a_{t+1} = (1-\tau)\, w\, y_t + p_t + g(k_t, \theta_t) - (1+\bar{r})\,(k_t - a_t) - c_t \tag{1}$$

$$k_t - a_t \leq \bar{k}\,(a_t, y_t, \theta_t) \tag{2}$$

$$a_{t+1}, k_t \geq 0 \tag{3}$$

Borrowing constraint

Entrepreneur borrows $k_t - a_t$.

Entrepreneur can default. Then he keeps assets worth $f \cdot k$ and becomes a worker next period.

Borrowing constraint limits k such that repaying debt is preferred to defaulting.

Implications:

1. Households with high wealth can borrow more and invest more in self-employment opportunities.
2. Households with high earnings can borrow *less* than those with low earnings.

Project: How could one specify borrowing constraints to generate borrowing behavior that resembles data?

Firms

Standard competitive firms rent capital and labor from workers.
Produce output according to $F(K_c, L_c) = A\, K_c^{\alpha} L_c^{1-\alpha}$.

Government

Taxes labor income at rate τ.
Revenues pay for transfers p during retirement.

Stationary Equilibrium

Objects:

- Decision rules: $c(x), a(x), k(x)$ where $x = (a, y, \theta, s)$ is the household's state vector.
- A decision rule for the choice between entrepreneurship and work.
- Prices: $w, \bar{r}$.
- Government policies: τ, p.
- A borrowing limit $\bar{k}(x)$.
- A distribution over household types $m(x)$.

These satisfy:

- The decision rules are optimal.
- The government budget is balanced.
- Prices equal marginal products.
- Households prefer not to default for every x.
- The distribution of types is stationary.

Remarks

This problem is difficult to compute, mainly because of the borrowing constraint.

- Given a borrowing constraint, solve the household problem by backward induction.
- Compute value of being a worker or entrepreneur for every x.
- Let households choose occupation with higher value.

Main complication:

- Value function may not be concave or differentiable everywhere because the household switches from worker to entrepreneur at certain levels of a.

Borrowing constraint adds another fixed point problem:

- Given the value functions, the borrowing constraint must be adjusted to make sure no household defaults.

Calibration

Standard choices for:

$\sigma = 1.5$.

$\delta = 0.06$.

$p = 40\%$ of mean household earnings.

Labor endowment process approximates PSID estimates.

π_y and π_o match mean length of working life and retirement.

Self-employment productivity is either 0 or θ.

- Implications: **all** self-employed are rich (very different from data)

Six remaining parameters: $\beta, \theta, P_\theta, \nu, f$ are chosen to match:

- fraction of population self-employed (P_θ),
- length of self-employment spells (P_θ),
- K/Y (β)
- K_C/K (θ, ν)
- fraction of output earned by entrepreneurs (θ, ν)
- aggregate bequest flows (which parameter pins that down?)

Remarks

Calibration is weak:

- Bequests flows are not closely related to any of the parameters (usually determined by strength of altruism).
- Bequests flows cannot be estimated precisely.
- There is effectively a (nearly) free parameter.

Entrepreneurship is "nearly exogenous."

With only 1 value for θ and with strong persistence of θ, households will almost always choose self-employment when possible.

Households are very impatient: $\beta = 0.87$.

- Intuition: relative to the basic life-cycle model, households save more (b/c of the possibility of future self-employment).
- But workers hold less wealth than in basic life-cycle model.

Findings

The model accounts for the cross-sectional wealth distribution.

TABLE 6
Comparing Data and Models with and without Entrepreneurs

	Capital-Output Ratio	Wealth Gini	Entrepreneurs	Percentage Wealth in Top			
				1%	5%	20%	40%
U.S. data	3.0	.8	7.55%	30	54	81	94
Baseline model without entrepreneurs	3.0	.6	.0%	4	20	58	95
Baseline model with entrepreneurs	3.0	.8	7.50%	31	60	83	94

Results are robust against relaxation of altruism and borrowing constraints.

Entrepreneurs have high saving rates

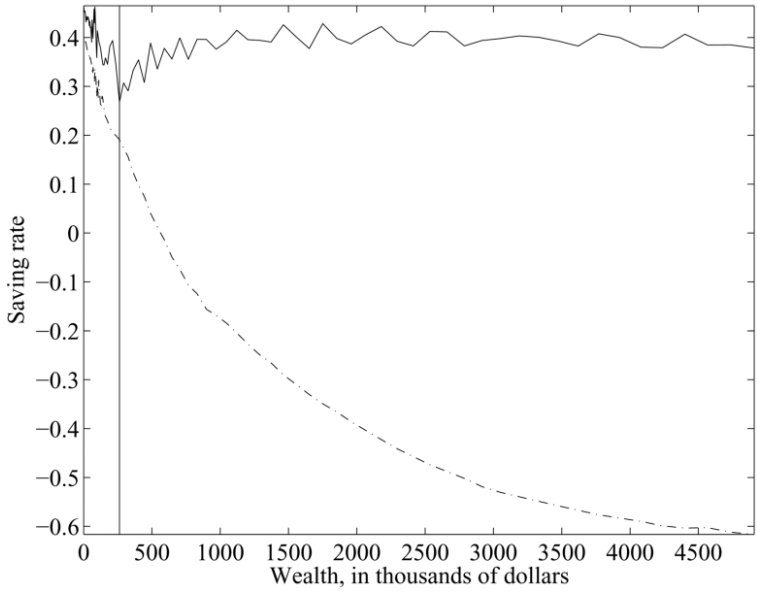


FIG. 5.—Saving rate for highest-ability workers. Solid line: those with high entrepreneurial ability; dash-dot line: those with no entrepreneurial ability; vertical line: asset level at which high–entrepreneurial ability individuals enter entrepreneurship.

This is key for generating high wealth concentration: the rich must also save a lot.
Intuition:

- Borrowing constraint raises the return to capital.
- Self-employment state is transitory.

Open Questions

1. Does the model get the wealth distribution among workers / among self-employed?
   (a) It looks like all model self-employed are rich. Not true in the data.
   (b) Are there any wealthy workers (managers, lawyers, ...)?
2. Is the correlation between earnings or income and wealth too high?

Some answers in Hendricks (2007).
But one could do a lot more to answer these questions.

My Conclusion

Life-cycle models attribute wealth inequality to earnings and age. Therefore, models imply:

- very little wealth inequality within lifetime income deciles.
- too low intergenerational persistence of consumption and wealth.

Bequests change these conclusions, but probably not as much as people think.
Entrepreneurship fixes the 20% that are entrepreneurs, but probably not the workers.

Conclusion: Life-cycle models lack an important source of wealth inequality (which is intergenerationally persistent).
Preferences?

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