Entrepreneurship, Frictions and Wealth

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Previous work:

- Potential and existing entrepreneurs face borrowing constraints.

- Entrepreneurship is key to understand wealth inequality.

Entrepreneurs and borrowing constraints

- entrepreneurial choice depends on own assets and received bequests
- entrepreneur's portfolio undiversified
- collateral

Entrepreneurs and wealth inequality

- wealth more concentrated than labor earnings and income

- small fraction of entrepreneurs hold large share of total wealth (they also have higher saving rates)

Top %	1	5	10	20
Whole population				
% total net worth held	30	54	67	81
Active Bz. owners				
% hhs in given perc.	65	51	42	30
SE				
% hhs in given perc.	62	47	38	26
SE and Bz. owners				
% hhs in given perc.	54	39	32	22

What we do:

- Construct a quantitative model consistent with observed data.

- Evaluate model along dimensions not matched by construction.

- Study effects of borrowing constraints on aggregates and wealth inequality.

Preview of results

– Model accounts very well for wealth distributions of entrepreneurs and workers

– Model generates entry into entrepreneurship consistent with Hurst and Lusardi's estimates

– Model generates entrepreneurial returns consistent with those in SCF data

– More stringent borrowing constraints $\Rightarrow$ less inequality but also less investment

– Voluntary bequests important for wealth concentration

Demographics

households: overlapping generations (possibly) with altruism.

Two stages of life: young and old, stochastic aging

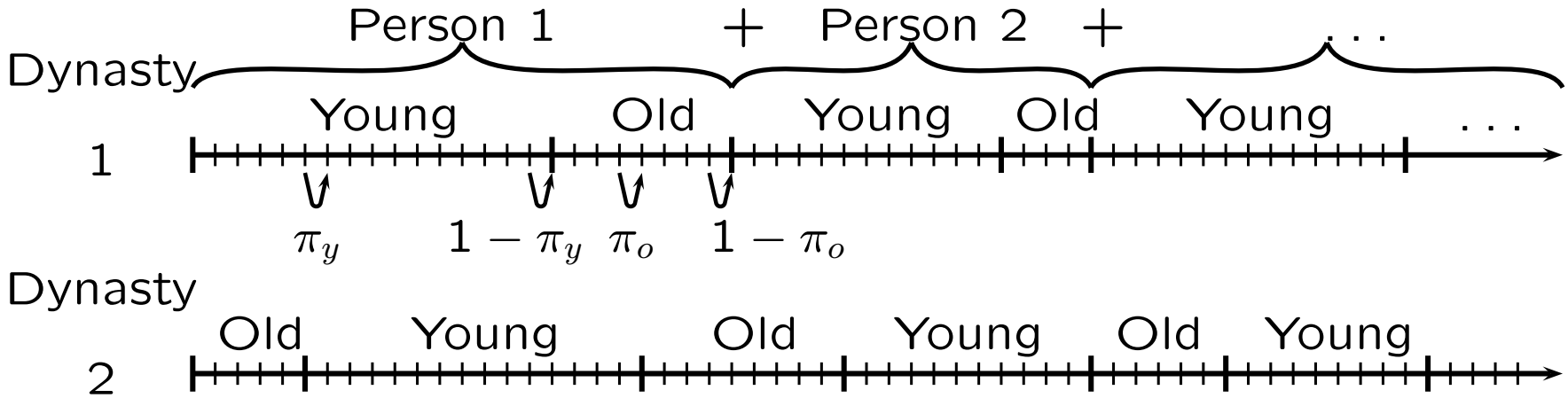
$1 - \pi_y$=pr of aging

$1 - \pi_o$=pr of dying

Demographics: OLG with stochastic aging

1 model period = 1 year

Trick to keep computations manageable with short time periods



Household's preferences

Period utility: CRRA in consumption

$$\frac{c^{1-\sigma}}{1-\sigma}$$

Discount the future at rate β.

Potentially altruistic toward own descendants (η).

Technology

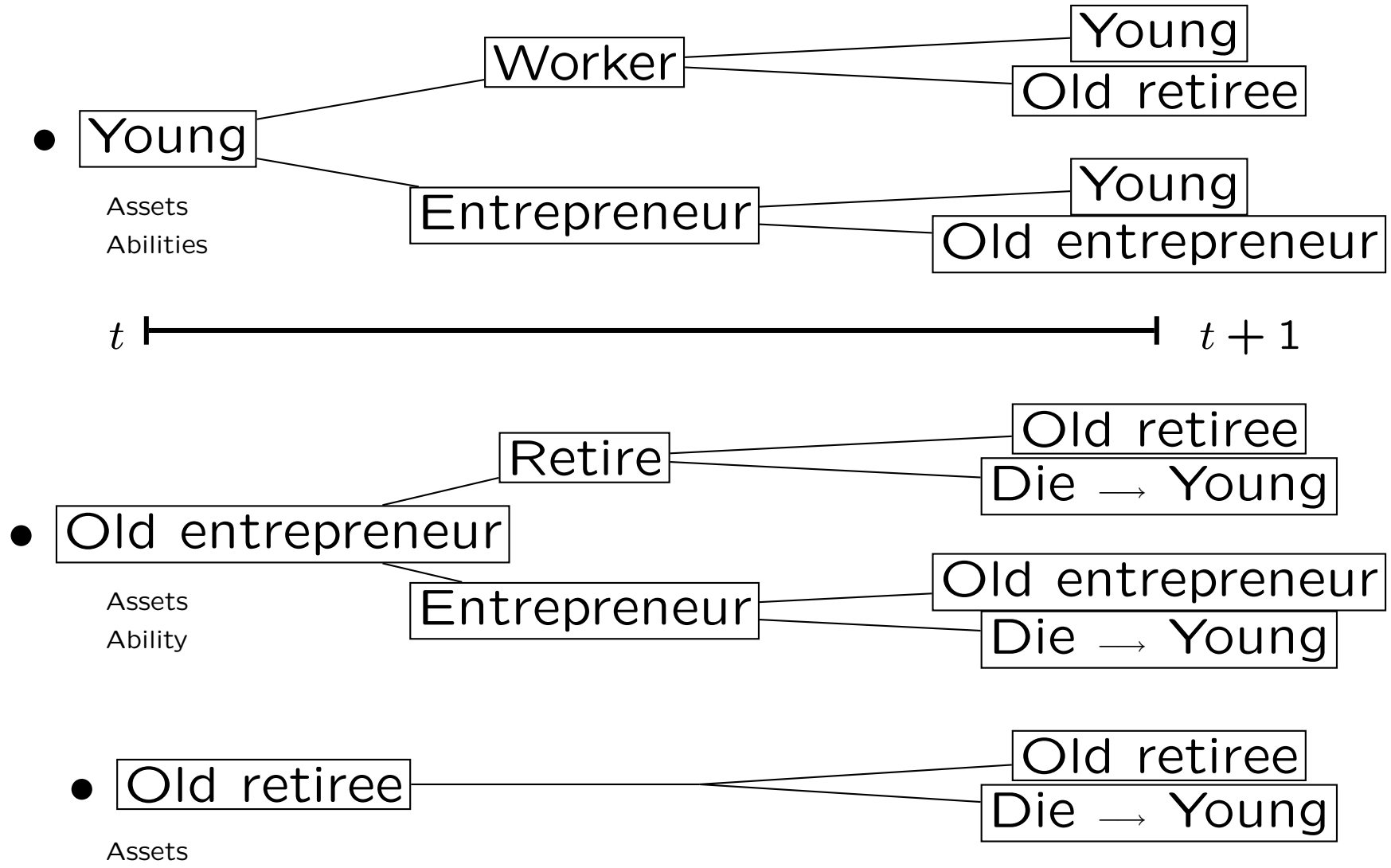
- entrepreneurial sector:

  $(1-\delta)k + \theta k^{\nu} \quad 0 < \nu < 1$

- non-entrepreneurial sector:

  Cobb-Douglas tech employs all workers and the rest of the capital

Time line of decisions



Households

- observe (y,θ)
- choose (w,e) for the period
- workers earn y
- entrepreneurs invest k

Credit market constraints

- imperfectly enforceable contracts:

  can borrow $(k - a)$, be worker, keep fk, creditors seize $(1 - f)k$

  value (investing and repaying) $\geq$ value (keeping fk) and being worker

- e can borrow at $\bar{r}$, invest k, worker can save at $\bar{r}$

Young's problem

$$V(a, y, \theta) = \max\Big\{V_e(a, y, \theta), V_w(a, y, \theta)\Big\}$$

Young entrepreneur's problem

$$V_e(a, y, \theta) =$$

$$\max_{c,k,a'} \Big\{ u(c) + \beta \pi_y EV(a', y', \theta') + \beta(1 - \pi_y) EW(a', \theta') \Big\}$$

$$a' = (1 - \delta)k + \theta k^{\nu} - (1 + \bar{r})(k - a) - c$$

$$V_e(a, y, \theta) \geq V_w(f \cdot k, y, \theta)$$

$$a \geq 0 \qquad k \geq 0$$

Young worker's problem

$$V_w(a, y, \theta) =$$

$$\max_{c,a'} \Big\{ u(c) + \beta \pi_y EV(a', y', \theta') + \beta(1 - \pi_y) W_r(a') \Big\}$$

$$a' = (1 + \bar{r})a + w_g y - c \qquad a' \geq 0$$

Old entrepreneur's problem

$$W(a,\theta) = \max\Big\{W_e(a,\theta), W_r(a)\Big\}$$

$$W_e(a,\theta) = \max_{c,k,a'}\Big\{u(c) + \beta\pi_o EW(a',\theta') + \eta\beta(1-\pi_o)EV(a',y',\theta')\Big\}$$

$$a' = (1-\delta)k + \theta k^{\nu} - (1+\bar{r})(k-a) - c$$

$$W_e(a,\theta) \geq W_r(f\cdot k)$$

$$a \geq 0 \qquad k \geq 0$$

Old retiree's problem

$$W_r(a) =$$

$$\max_{c,a'} \Big\{ u(c) + \beta \pi_o E W_r(a') + \eta \beta (1 - \pi_o) E V(a', y', \theta') \Big\}$$

$$a' = (1 + \bar{r})a + p - c$$

$$a' \geq 0$$

Equilibrium

Prices, decision rules and distribution m over x s.t.

– decision rules solve hh's problem

– capital and labor mkts clear

– prices equal marginal products

– m is invariant distribution

Fixed Parameter	Value
σ	1.5
δ	.06
α	.33
A	1
π_y	.98
π_o	.91
P_y	+
p	40% average yearly income
η	1.0

Calibrated Parameter	Value
β	.852
θ	[0, 0.55]
P_θ	see text
ν	.88
f	75%

Match following moments:

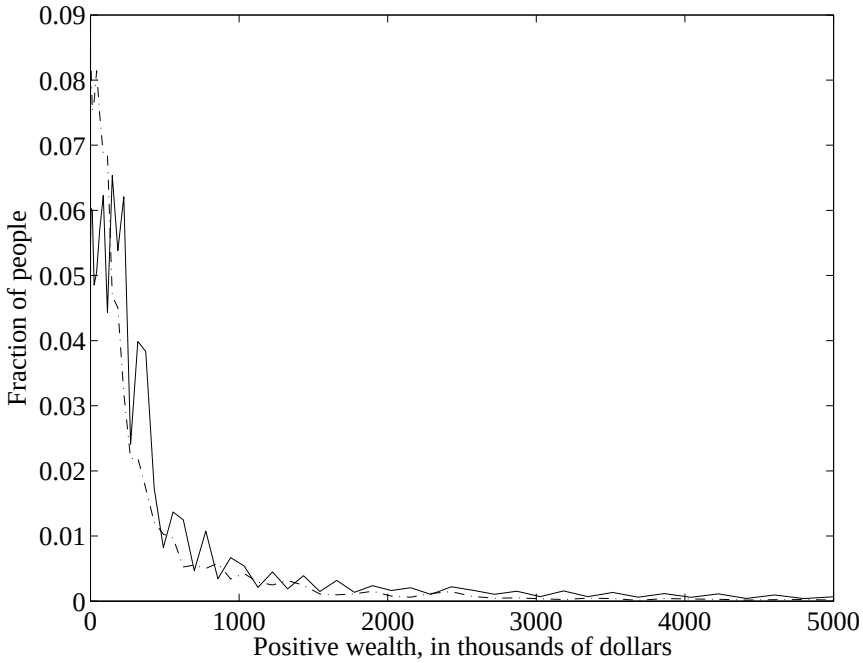
- capital to GDP ratio
- frac. of entr. in pop.
- frac. of entr. becoming workers in each period
- frac. of workers becoming entr. in each period
- median net worth of entr./median net worth. workers
- fraction of people with zero wealth

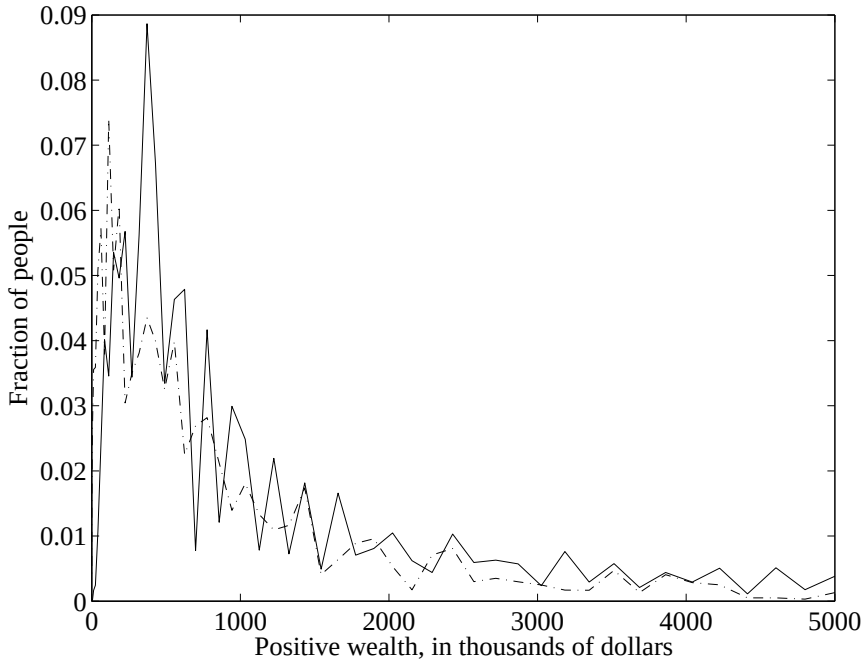
Evaluate model along:

- overall wealth distribution
- entrepreneurs' wealth distribution
- Hurst and Lusardi's key regression results
- Private equity returns

K/Y	Wealth Gini	Perc. entr.	Perc. wealth in the top 1%	5%	20%	40%
U.S. data						
3.0	.78	7.6%	30	54	81	94
Baseline with entrepreneurs						
3.0	.79	7.6%	29	57	81	94

Distribution of wealth, model with entrepreneurs

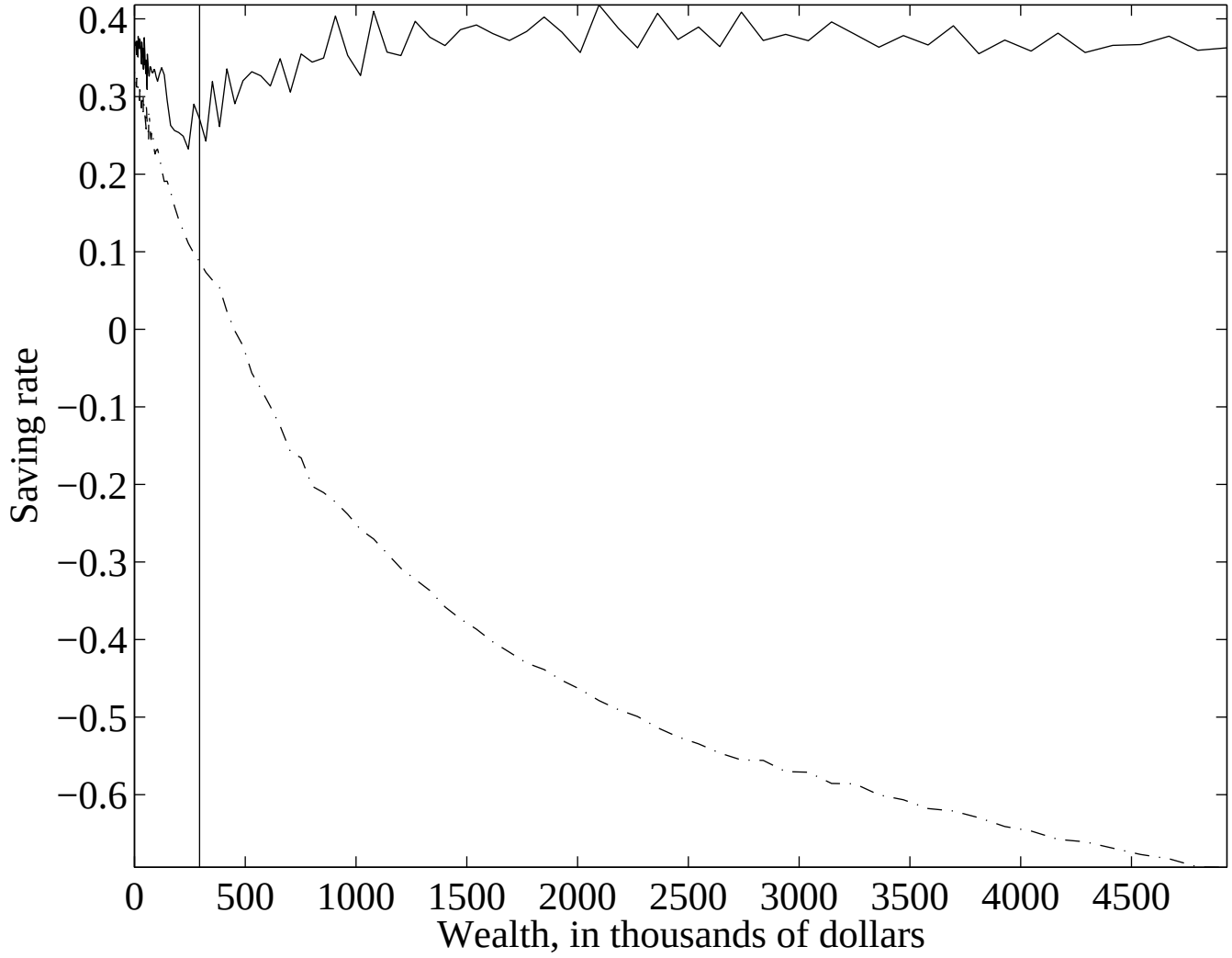




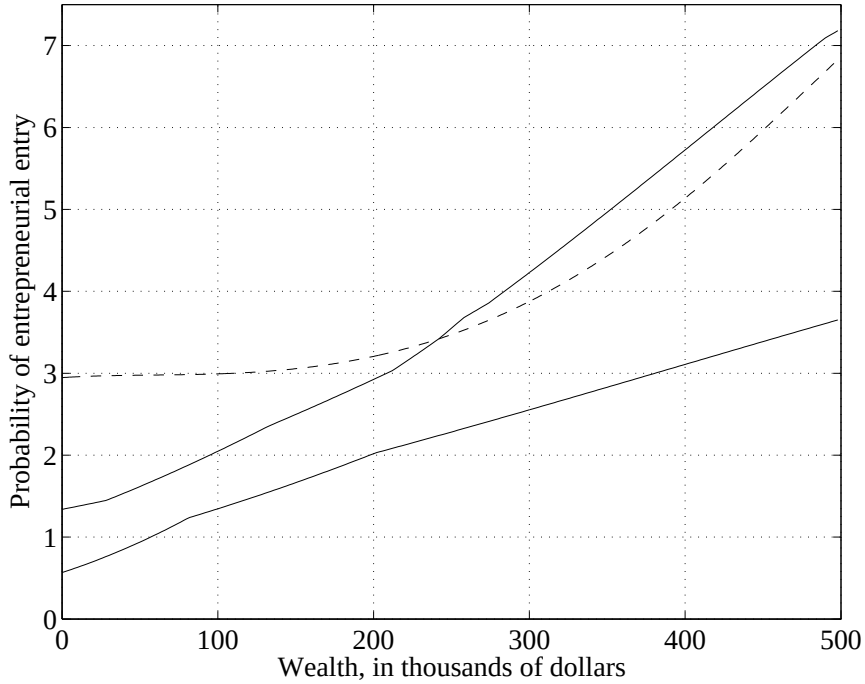
Population Entrepreneurs

Dash-dot line: data; Solid line: baseline model.

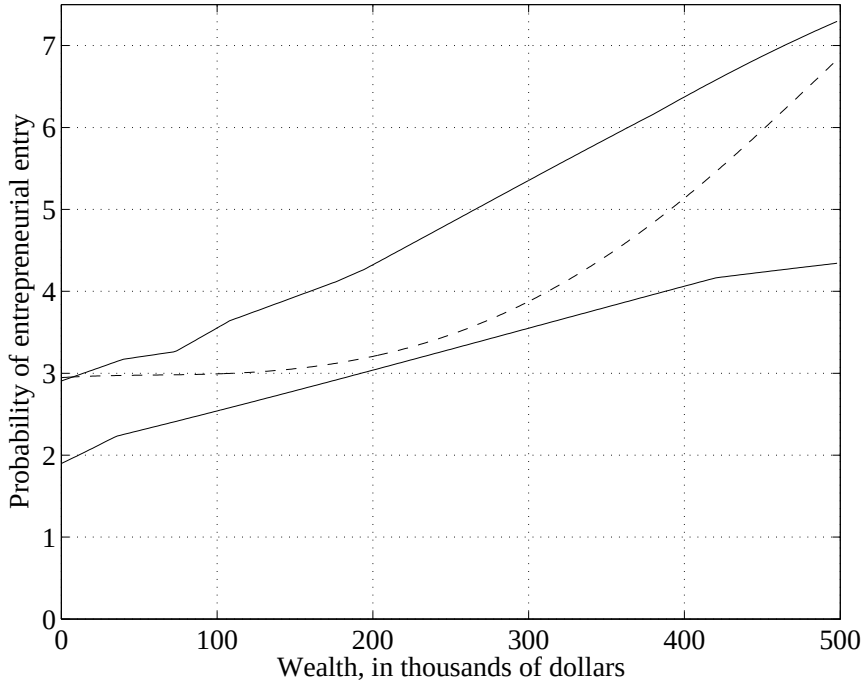
Saving rate for highest-ability workers. Solid: high entr. ability; dash-dot: no entr. ability



Probability of entering entrepreneurship as function of own wealth (as Hurst and Lusardi).



Benchmark



Small fraction of "non-entrepreneurial self-employed"

Median rate of return (income divided by business net worth).

SCF data, capital income only: 3%

SCF data, total income: 40%

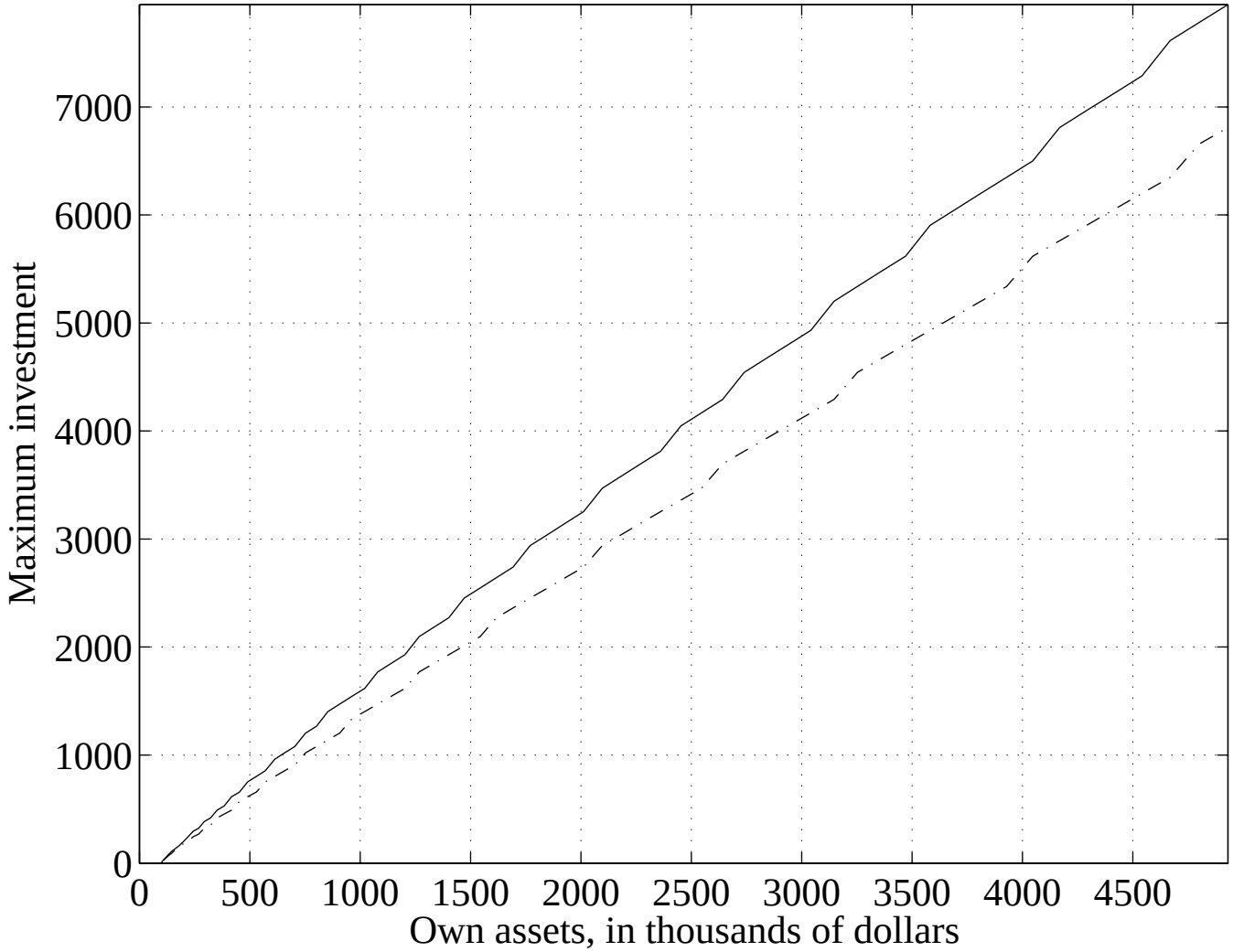
Model, total income: 47%

Model, total income, 10% underreporting: 40%

Model, total income, 20% underreporting: 35%.

Capital-output ratio	Wealth Gini	Perc. entr.	Percentage wealth in the top 1%	5%	20%	40%
U.S. data						
3.0	.78	7.6%	30	54	81	94
Baseline with entrepreneurs						
3.0	.79	7.6%	29	57	81	94
More stringent borrowing constraints: $f = 0.85$						
2.7	.72	6.8%	22	45	73	91
No altruism: $\eta = 0$, only involuntary bequests						
2.5	.72	7.3%	19	43	72	91
$\eta = 0$, recalibrated β						
3.0	.78	7.9%	26	53	79	93

Maximum investment. Solid line: baseline; dash-dot line: more restrictive BC.



U.S. wealth and earnings distributions

Percentage held by the top				
1%	5%	20%	40%	80%
Wealth				
30	54	81	94	100
Gross earnings				
6	19	48	72	98

SCF questions:

1. "Do you work for someone else, are you self-employed, or what?"

2. "Do you (and your family living here) own or share ownership in any privately-held businesses, farms, professional practices or partnerships?"

3. "Do you (or anyone in your family living here) have an active management role in any of these businesses?"

	% in pop.	Share tot. wealth
Bz. owners or SE	16.7	52.9
All bz. owners	13.3	48.8
Active bz. owners	11.5	41.6
All SE	11.1	39.0
SE bz. owners	7.6	33.0

	median	mean
Whole population	47	189
Business owners or SE	172	599
All business owners	205	695
Bus owners but not active mgmt	293	768
Business owners not SE	179	470
All self-employed	169	665
SE (active) business owners	265	829
SE and not business owners	36	224

Top %	1	5	10	20
Whole population				
% total net worth held	30	54	67	81
Bz. owners or SE				
% hhs in given perc.	81	68	54	39
All Bz. owners				
% hhs in given perc.	76	62	49	36
Active Bz. owners				
% hhs in given perc.	65	51	42	30
SE				
% hhs in given perc.	62	47	38	26
SE and Bz. owners				
% hhs in given perc.	54	39	32	22

Related Literature

- entrepreneurial choice
  Gentry and Hubbard, Evans and Jovanovic, Quadrini

- wealth accumulation
  Diaz-Gimenez et at., Quadrini and Rios-Rull, Castañe
  et al., De Nardi

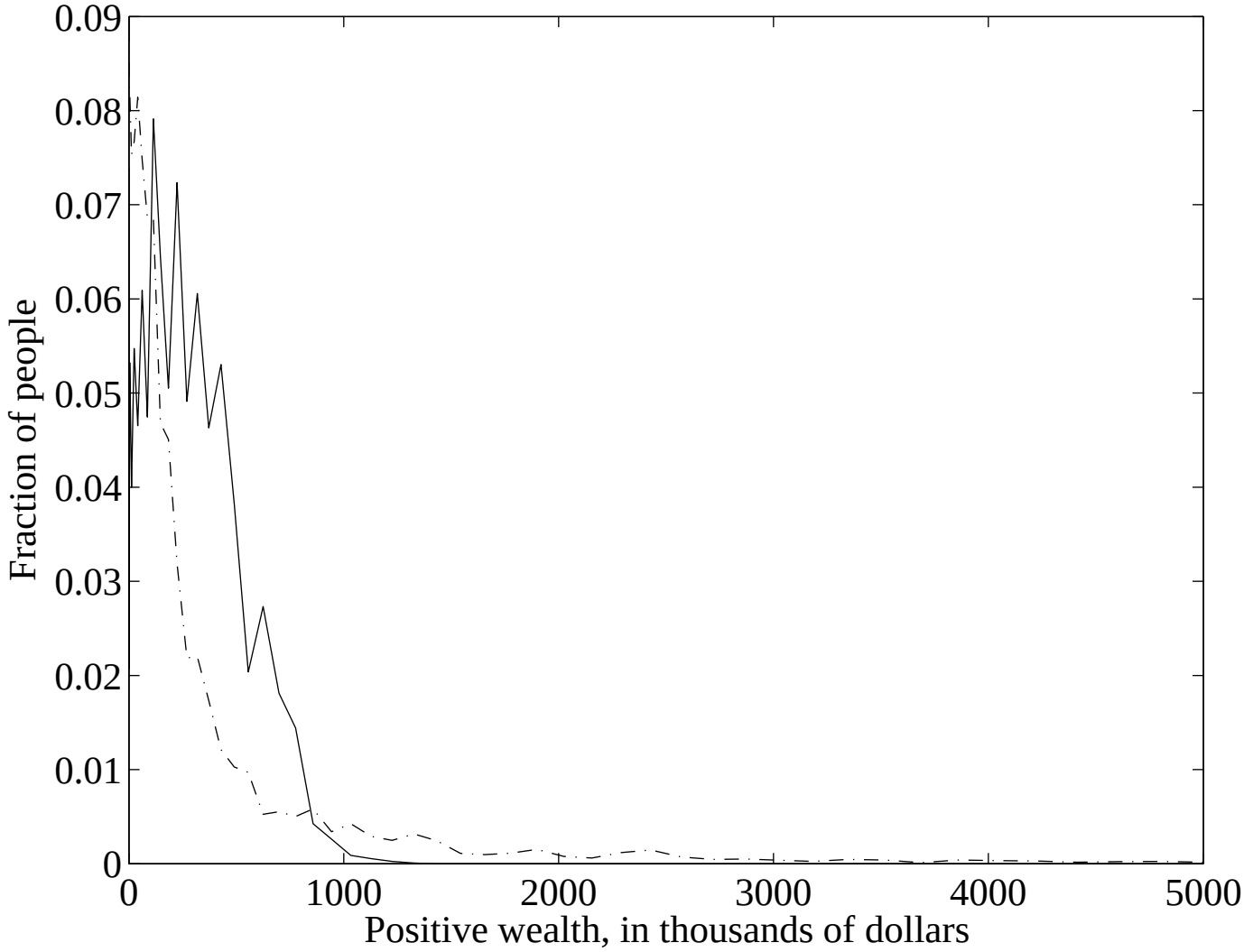
- optimal contracts
  Albuquerque and Hopenhayn, Monge

Algorithm

- fix $\widehat{k}(\cdots) = k_{max}$, solve val. fns
- check endogenous b.c.
- if not satisfied, update $\widehat{k}(\cdots)$
- iterate until $\widehat{k}(\cdots)$ satisfies end. b.c.

- iterate until capital markets clear

Distribution of wealth, model without entrepreneurs. Dash-dot: data; Solid: model.



Firm size distribution, baseline model with entrepreneurs.