

WORKSHOP

Entrepreneurship, Taxation and Credit Constraints

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November 14, 2016

Objective

Using a realistic model and the French Wealth Survey of 15 000 HH ("Enquête Patrimoine"), explain and replicate the top of the wealth and income distributions in France.

- Follow Cagetti and De Nardi (2006 and 2009).
- Use recent numerical methods.

Extend it with:

- 1 Progressive tax schedule.
- 2 Entrepreneurship cost of entry.
- 3 Labor market.

Stylized facts (FR)

Data for France supports the U.S. facts highlighted by Quadrini (1999) and Cagetti and De Nardi (2006).

- Wealth Gini (FR) (0.7) \gg Before income taxes Gini (FR) (0.48).
- Entrepreneurs (defined as business owners with an active role in the business) accumulate more wealth relative to workers and account for 8.7% of the working population plus retired people.
- Entrepreneurs are financially constrained (Schmalz, Sraer and Thesmar (2013)).

The U.S. stylized facts seem also valid in France.

Stylized facts (FR)

Table 1: French and US wealth distributions

Top	France* (Wealth Survey)	France** (HFCS - recalculated)	U.S. (***)
0.1%	7.35	10.2	-
1%	21.53	21.0	30
5%	42.64	38.8	54
10%	56.46	51.7	67
20%	72.02	68.5	81
40%	87.85	88.8	-

Source: (*) our own calculations, (**) Bach, Thiemann, and Zucco (2015), (***) Cagetti and De Nardi (2006).

Stylized facts (FR)

Table 2: Fraction (%) of entrepreneurs (according to various definitions) in a given wealth percentile of the working population plus retired people.

Top	Business owners	Entrepreneurs	Business managers and self-employed	Entrepreneurs* (US)
1%	51.4	29.7	31.9	54
5%	37.4	19.6	21.2	39
10%	34.8	18.3	19.9	32
40%	27.5	17.2	19.5	
80%	17.6	10.8	13.6	
100%	14.2	8.7	11.5	7.6
% of total wealth	33.6	19.1	21.1	33.0

Source: our own calculations, (*) Cagetti and De Nardi (2006).

Could explain why French distribution is less concentrated than in the US.

Stylized facts (FR)

Table 3: Mean and median net worth (in thousands of euros) for different types of people

Class	Mean	Median
Entrepreneurs	1180.9	549.8
Business owners	1097.7	487.7
Workers		
High qualified	460.6	285.7
Qualified	194.4	115.1
Low qualified	143.3	67.6
No qualification	81.2	21.4
Retired workers	579.9	237.5

Source: our own calculations.

Entrepreneurs are the wealthiest people among all classes.

Model (Cagetti and De Nardi (2006) - (2009))

General equilibrium framework with:

- Two idiosyncratic shocks (entrepreneurial ability (θ) and working ability (y))
- Two sectors: non-entrepreneurial and entrepreneurial
- Two period lives with voluntary bequests.
- Occupational choices (old retired worker, old entrepreneur, young entrepreneur, young worker).

Young choice: $V(a, y, \theta) = \max\{V_w(a, y, \theta), V_e(a, y, \theta)\}$

- Entrepreneurs are financially constrained.

$$V_e(a, y, \theta) \geq V_w(fk, y, \theta)$$

Occupational choice

Non-Entrepreneurial technology: $Y_{ne} = AK_{corp}^{\alpha} L^{1-\alpha}$

Entrepreneurial technology: $f(k) = \theta k^{\nu}$

Occupational Choice:

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

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

Ex: entrepreneur (Young):

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

Subject to: $Y_e = f(k) - (r + \delta)k + ra$

$$c = a + (1 - t_y(Y_e))Y_e - T^{LS} - a'$$

$$(IC) \quad V_e(a, y, \theta) \geq V_w(fk, y, \theta)$$

$$k \geq 0, \quad a' \geq 0$$

Government

Revenue:

- Parametric progressive income taxation using HSV (Healthcote, Storesletten, Violante (2014)) function estimated using NLS from the Wealth Survey.

$$t_y(\tilde{y}) = 1 - \tau_0(\tilde{y})^{-\tau_1} \quad \text{with} \quad \tilde{y} = \frac{Y}{\bar{Y}}$$

- Mean \bar{Y} is used to scale the income tax function.
- A lump-sum tax (T^{LS}) closes the gap between total revenue and spending.

Spending:

- Public investment: a fraction γ of total output Υ .
- Payment of interests on its debt (at SS): a fraction ξ of total capital κ paid at price r .
- Social security: old-age pensions p for every old retired workers.

Stationary Recursive Equilibrium

Given the state vector $\mathbf{x} = (s, y, \theta, a)$; a SRE is a set of value functions $V_{yw}(a, y, \theta)$, $V_{ye}(a, y, \theta)$, $W_{or}(a)$, $W_{oe}(a, \theta)$, decision rules $a'(\mathbf{x})$, $c(\mathbf{x})$, $k(\mathbf{x})$, $s = \{yw, ye, or, oe\}$, prices $(r, \omega \in \mathbb{R})$, tax parameters $(\{\tau_0, \tau_1, \bar{Y}\} \in \mathbb{R})$ and a stationary probability distribution $\Gamma(\mathbf{x})$ such that

- the allocation choices maximize the HH problem given prices and taxes.
- $\Gamma(\mathbf{x})$ is the stationary probability measure of the first-order Markov chains induced by $a'(\mathbf{x})$, Π_y , Π_θ and Π_c .
- the asset and labor markets clear.

$$\kappa = \sum_{s \in S} \sum_{y \in Y} \sum_{\theta \in \Theta} \int_{\underline{a}}^{\bar{a}} a \Gamma(s, y, \theta, da) \quad (1)$$

$$K_{corp} = \frac{\kappa}{(1 + \xi)} - \sum_{s \in \{oe, ye\}} \int_{\underline{k}}^{\bar{k}} k \Gamma(s, dk) \quad (2)$$

- the government budget constraint is balanced.

Baseline model: calibration

14 parameters set to those in the literature and data for France.

Working abilities are set to match the earning Gini coefficient (0.358) using Tauchen and Hussein (1991).

The 6 remaining parameters to match 6 data moments using Simulated Method of Moments (SMM).

Table 8: Calibrated Parameters

Parameter	Value (FR)	Value (U.S.)*
β	0.9011	0.867
θ	$\begin{bmatrix} 0 & 0.4581 \end{bmatrix}$	$\begin{bmatrix} 0 & 0.514 \end{bmatrix}$
Π_θ	$\begin{bmatrix} 0.9757 & 0.0243 \\ 0.1848 & 0.8152 \end{bmatrix}$	$\begin{bmatrix} 0.964 & 0.036 \\ 0.206 & 0.794 \end{bmatrix}$
f	0.5876	0.75
ν	0.8935	0.87

(*) Cagetti and De Nardi (2006).

⇒ Parsimonious calibration close to Cagetti and De Nardi (2006) for US

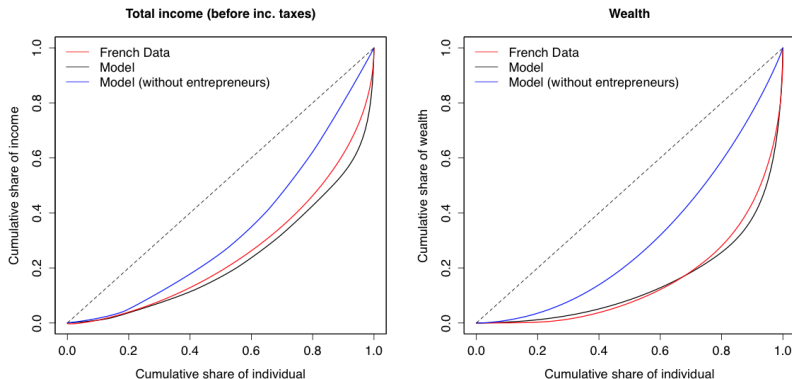
Moment	Baseline (with entrepreneurs)	Baseline** (without entrepreneurs)	Data
K/Y Ratio*	3.5	3.5	3.5
Entrepreneurs* (%)	8.68	-	8.7
Entrepreneur entry rate*	0.0178	-	0.0175
Entrepreneur exit rate*	0.2	-	0.2
Ratio of net worth VE / WW*	2.98	-	2.5 - 3.5
Wealth Distribution			
Wealth Gini*	0.7	0.39	0.697
top 0.1%	4.87	0.32	7.35
top 1%*	22.01	2.89	21.53
top 5%	48.48	12.24	42.64
top 20%	74.15	40.36	72.02
top 40%	87.11	67.79	87.85
% entrepreneurs in top 1%	33.1	-	29.7
Income Distribution			
Income Gini (after inc. taxes)	0.5	0.3	0.451
Income Gini* (before inc. taxes)	0.538	0.33	0.489
top 1% income	15.76	1.8	11.54

(*) Targeted.

(**) $\theta_1 = 0$ (no entrepreneur) and $\beta = 0.953$ recalibrated to match the K/Y ratio.

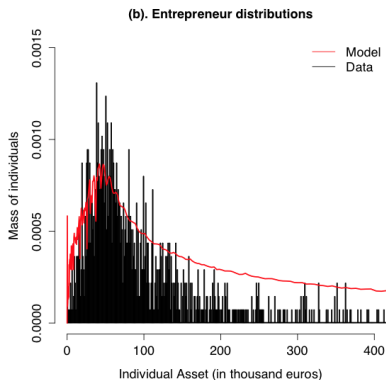
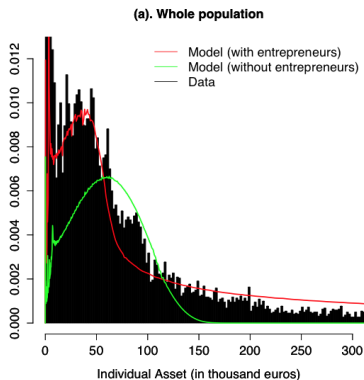
Lorenz Curves

Figure 1: Lorenz curves



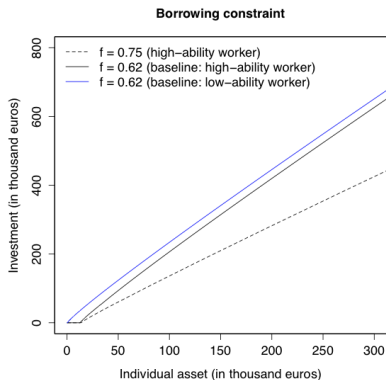
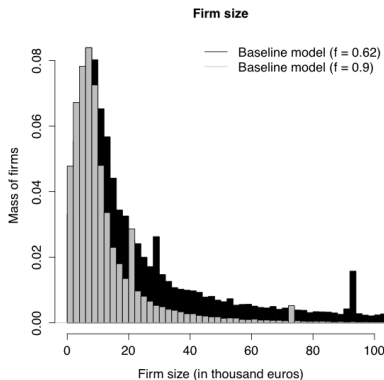
- Model with entrepreneurs able to explain the concentration at the top

Wealth and Income distributions



- Bequest motive: generates very rich families expanding during several generations the same business.

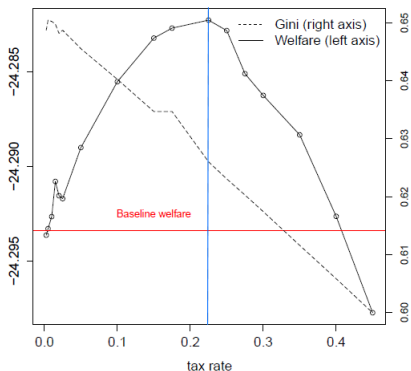
Borrowing constraint ($V_e(a, y, \theta) \geq V_w(fk, y, \theta)$)



- Allows the wealthiest entrepreneurs to borrow more and get more profits (wealth generates wealth).
- Selects entrepreneurs among the wealthiest people.
- Induces heterogeneity in firm sizes.

Policy Experiments: estate taxation

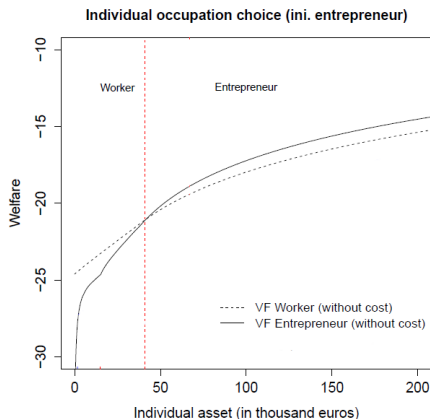
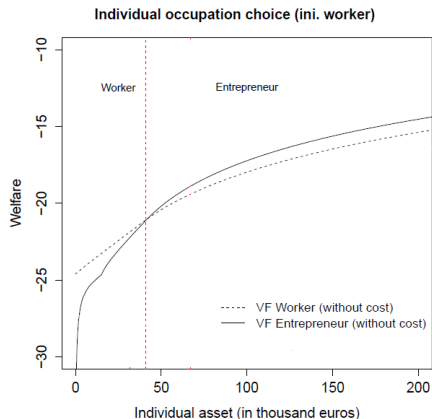
(b). Estate tax (exemption level 500)



Estate tax with intermediate exemption level (comparison SS - SS):

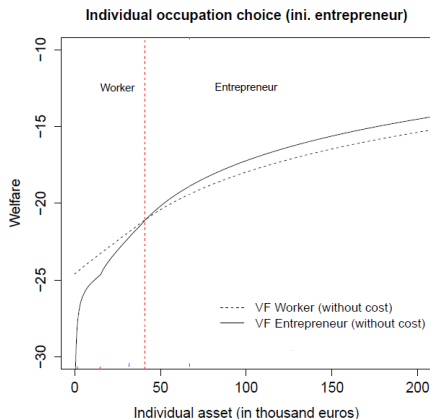
- \downarrow **Gini**: since decreases large firm sizes and $r \uparrow (\downarrow K) \Rightarrow \downarrow$ firm sizes $\Rightarrow \downarrow$ wealth concentration.
- \uparrow **Welfare**: since higher estate tax allows to reduce lump-sum tax.
- \downarrow **Welfare**: since higher estate tax reduces wealth level above a given exemption level.

Entrepreneurship cost of entry, young occupational choice



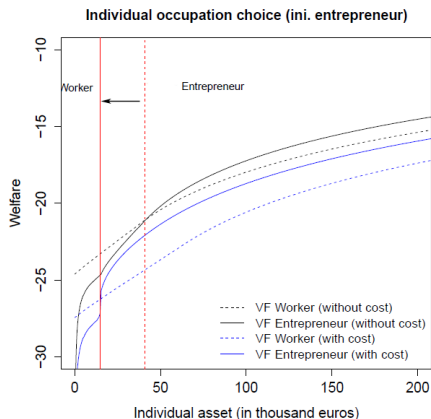
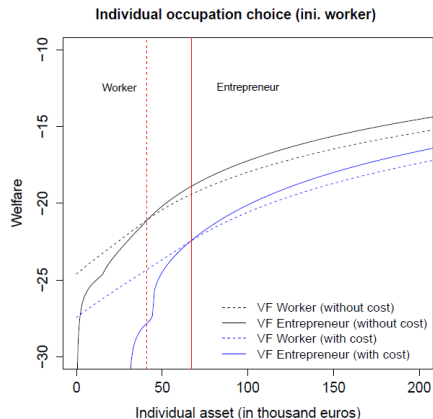
$$V_w(a, y, \theta) = \max_{c, a'} \{ u(c) + \beta((1 - \pi_o) \max\{EV_e(a' - c_f, y, \theta), EV_w(a', y', \theta')\}) + \beta(\pi_o W_r(a')) \}$$

Entrepreneurship cost of entry, young occupational choice



$$V_w(a, y, \theta) = \max_{c, a'} \{ u(c) + \beta((1 - \pi_o) \max\{EV_e(a' - c_f, y, \theta), EV_w(a', y', \theta')\}) + \beta(\pi_o W_r(a')) \}$$

Entrepreneurship cost of entry, young occupational choice



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Entrepreneurship cost of entry

Table 9: Generated moments with entry cost

Moment	Data	Baseline model	With entry cost
K/Y ratio	3.5	3.5	3.48
Wealth Gini	0.67	0.65	0.67
Income Gini	0.46	0.48	0.57
Entrepreneurs (%)	8.3	8.35	4.32
Percentage wealth in top			
1%	17.8	18.55	21.41
5%	36.3	41.55	44.54
40%	87.8	84.03	85.05

- Diminishes the fraction of entrepreneurs
- Entrepreneurs become wealthier (less stringent borrowing constraint)

Future research: labor market and taxation

Introduce endogenous labor supply from workers and labor demand from entrepreneurs to better assess the effect of taxation.

- Entrepreneurs are 8.7% of the working population but represent **21% of total government revenue** raised by income taxes.
- Entrepreneurial sector **hires almost half of the total labor force**.

Taxation (through income, wealth, corporate benefits...):

- Would reduce the fraction of entrepreneurs by reducing the entrepreneur's profit and then the fraction of total labor employed.
- Create discentive to work.

An objective could be to study the impacts of taxation on the Laffer curve, inequalities and welfare and find the optimal taxation policies in the class of parametric models.

Conclusion

- Our version of the Cagetti & De Nardi model fits well the French wealth distribution.
- Entrepreneurs and the borrowing constraint are the main driving force.
- Optimality in estate taxation exists with intermediate exemption level.
- Cost of entry generates more wealth concentration.