Entrepreneurship, Labor Market Mobility and the Role of Entrepreneurial Insurance

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$\approx$ 30 minutes

Overview

- **Entrepreneurship is risky**
  - exit rate is high (22 - 26% per year),
  - entrepreneurial earnings are right skewed distributed and
  - are much more volatile than for wage earnings
- **Risk is a barrier** that affect the **quantity** of entrepreneurs
  - Risk perception and business creation (Arenius and Minniti, 2005),
  - Bankruptcy regulation plays a crucial role (Mankart & Rodano, 2015)

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Research questions:

1. How **occupational mobility**, **entrepreneurial risk**, **skills** and **wealth** interact?
2. How better **insuring** entrepreneurial risk affect **occupational choice** and entrepreneur's **quality**?
3. How it compares to a basic **start-up subsidy**?

Outline

1. We build a GE occupational choice model that accounts for
   - heterogeneous agents (ability, wealth)
   - risky entrepreneurship (persistent business shock)
   - labor market frictions

2. We match key features of occupational flows and entrepreneurship
   - replicate occupational flows as observed in CPS
   - infer (unobservable) entrepreneurial ability using occupational flows
   - replicate wealth and income distributions as observed in SCF

3. What is the effect of providing a (partial) insurance / a start-up subsidy to unemployment individuals starting a business?

UI and entrepreneurship in US

Current Unemployment Insurance (UI) system:

- In almost every US states, **UI benefits are lost when starting a business.**

  Ex: Pennsylvania Unemployment Compensation Law:

  "*a claimant is ineligible for any week in which he/she is engaged in self-employment. When a claimant is starting a new business, the claimant becomes self-employed with the first positive step toward starting the business.*"

- create a **bias** for paid-employment rather than self-employment.
  - unemployed individuals are more likely to search for a job

Motivation: the European experiments

Recent policies that extend UI toward entrepreneurship:

- France: "PARE" reform implemented in 2002 guarantees UI provision to (new entrepreneurs) previously unemployed.
  - Hombert et al. (2017): no effect on the pool of entrepreneurs
- Germany: "Bridging Allowance" implemented in 1985, similar to the French reform.
  - empirical study: Caliendo and Künn (2011): new entrepreneurs were more qualified and run larger firms.

This paper: theoretical model where we can assess impacts of such policy on occupational choices and the pool of entrepreneurs.

Related literature

- Modelling entrepreneurship
  - **Entrepreneurs are heterogenous**: abiliy (Lucas, 1978), wealth (Quadrini, 2002), risk aversion (Herranz et al., 2014)
  - **Financial frictions**: Cagetti & De Nardi (2006), Buera & Shin (2013), Mankart & Rodano (2015)
  - **Labor market transitions**: Poschke (2009) and Visschers et al. (2014)
- Entrepreneurship and insurance policy
  - **Entrepreneurial insurance:** Fairlie et al. (2011), Caliendo and Künn (2011), Hombert et al. (2014), Ejrnæs and Hochguertel (2014)
  - **Bankruptcy law:** Mankart & Rodano (2015).

Model

Two sectors: a corporate sector populated by workers and an entrepreneurial sector.

Households

- common heterogeneity: innate ability θ, wealth a.
- can be employed (W), unemployed (U) or self-employed (E)
- can be insured ($j = i$) or not ($j = n$)
- can access the credit market ($e = A$) or be excluded ($e = C$) , depending on previous bankruptcy decision.

Government:

- Baseline model: runs a standard UI program.
- Policy experiment: also implement DRI and SUS policies

Model: Workers

- can search a business idea *on-the-job* with intensity s_e and find it at rate $\pi_e(s_e)$.
- can be laid-off with probability $\eta(\theta)$
- labor income: combines innate ability (θ) and transitory shock (y)
- pay tax τ_w on his labor income $w\theta y$ to finance UI benefits.

$$W(\mathbf{x_w}) = \max_{c,a',s_e} u(c, s_e) + \beta \mathbb{E}_{\mathbf{x'_w}|\mathbf{x_w}} \Big\{ (1-\eta)\big[(1-\pi_e)W' + \pi_e \max\{E', W'\}\big] + \eta\big[(1-\pi_e)U_i' + \pi_e \max\{E', U_i'\}\big] \Big\}$$

$$\text{s.t.} \qquad c = (1-\tau_w)w\theta y + (1+r^d)a - a'$$

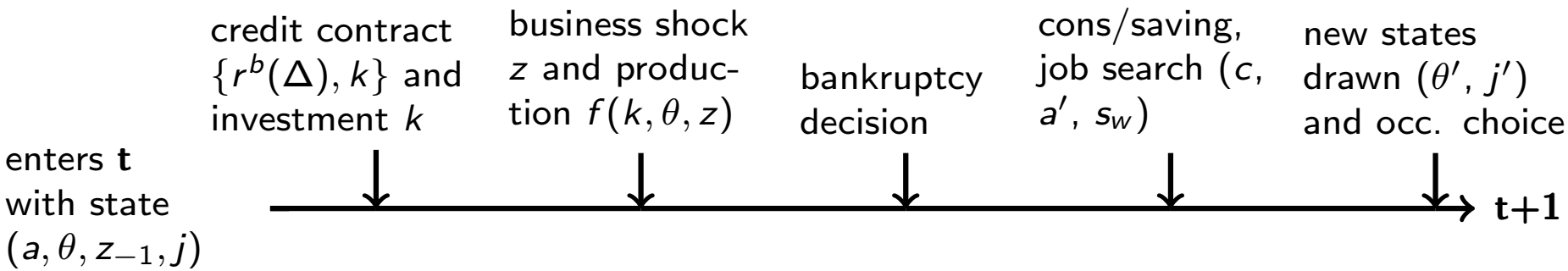
Model: Unemployed individuals

- Can search for a job and a business idea with effort s_w and s_e
- Find job with probability $\pi_w(s_w)$ and business idea with $\pi_e(s_e)$.
- Receive home production endowment m.
- If insured ($j = i$): receive UI benefits $b(\theta) = \mu\theta w$ and lose rights with probability ρ.

$$U(\mathbf{x_u}) = \max_{c,a',s_w,s_e} u(c, s_w, s_e) + \beta \mathbb{E}_{\mathbf{x}'_\mathbf{u}|\mathbf{x_u}} \Big\{ \pi_w \big[(1-\pi_e) W' + \pi_e \max\{E', W'\} \big] + (1-\pi_w) \big[(1-\pi_e) U' + \pi_e \max\{E', U'\} \big] \Big\}$$

$$\text{s.t.} \quad c = m + \mathbb{1}_{\{j=i\}} (1-\tau_w) b(\theta) + (1+r^d) a - a'$$

Model: Entrepreneur program



- Can search a job *on-the-business* with intensity s_w
- Face persistent business shock z and choose capital invested k (can use wealth or borrow) before z is realized.
- Borrowing rate $r^b(\Delta)$ is determined endogenously.
  - repayment: repay $(1 + r^b(\Delta))$*loan* and can pursue his activity.
  - bankruptcy: firm liquidation and debt renegociation. Entrepreneur recover $(1 - \xi)k$ and is temporarily credit excluded.
- Production function: $f(k, \theta, z) = zg(\theta)(k)^\nu$, where $g(\theta)$ maps θ into entrepreneurial ability.

Parameterisation

Objective: capture the main facts concerning occupational flows and entrepreneurship.

Table: Targeted moments (time is a quarter)

Moment	**Target**			**Model**		
Unemployment rate (%)	5.0			5.06		
Entrepreneurship rate (%)	8.5			8.5		
Entrepreneur's exit rate (%)	6			5.8		
Ratio of net worth E/W	8.0			8.04		
Capital used by entrepreneurs (%)	30			29.7		
% of entrepreneurs with neg. earnings (%)	3			3.3		
Flows W to E by quantiles / avg rate (%)	$Q1$	$Q2$	$Q3$	$Q1$	$Q2$	$Q3$
	1.08	0.87	1.07	1.08	0.87	1.07

The U-shaped curve in the transition W - E $\rightarrow$ provides a mapping between working and entrepreneurial abilities.

Results: Non targeted statistics

Statistic	**Data**	**Model**
Necessity share* (%)	12-13	10
New entrepreneurs previously unemployed (%)	20	21
Median ratio ent. net worth to whole pop.	6.57	6.42
Median ratio workers over ent. income	1.65	1.61
Median debt to income ratio	0.5	0.75
Fraction total ent. wealth (%)	30	32.6
std deviation log E's income / log W's income	2 - 4	2.5

*Necessity share: when $W(\mathbf{x_w}) > E(\mathbf{x_e}) > U(\mathbf{x_u})$

Results: search behavior

Occupational flows depend on individuals' ability and wealth through search efforts.

Figure: Unemp. job search (s_w)

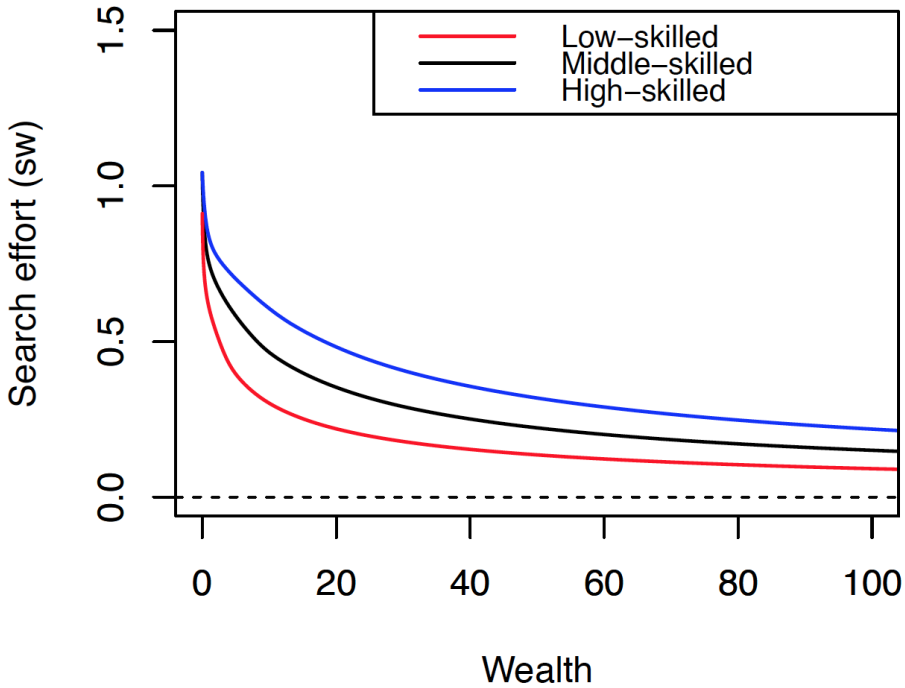
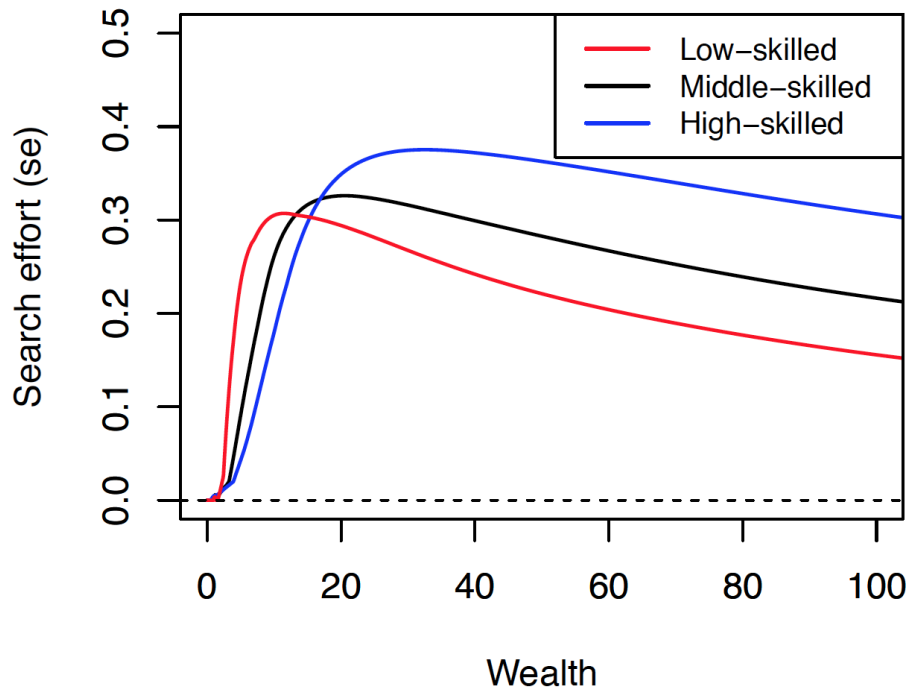


Figure: Unemp. business search (s_e)



- Financial frictions: crucial role in the business search effort intensity.
- Disincentive to search increases in wealth.

Results: transition between occupations

	W	E	U
W	97.5 (97.6)	0.5 (0.5)	2.1 (1.9)
E	5.2 (5.2)	94.2 (93.9)	0.5 (0.8)
U	44.2 (43.1)	2.4 (2.4)	53.4 (54.5)

Table: Generated quarterly flows between occupations. Data counterparts between braces using CPS from 2001 to 2008.

- Only W to U and entrepreneur's exit rate (6%) are targetted. Most entrepreneurs switch endogeneously to paid-employment.
- Within transitions by ability level are also close to their data counterparts.

Results: entrepreneurial earnings

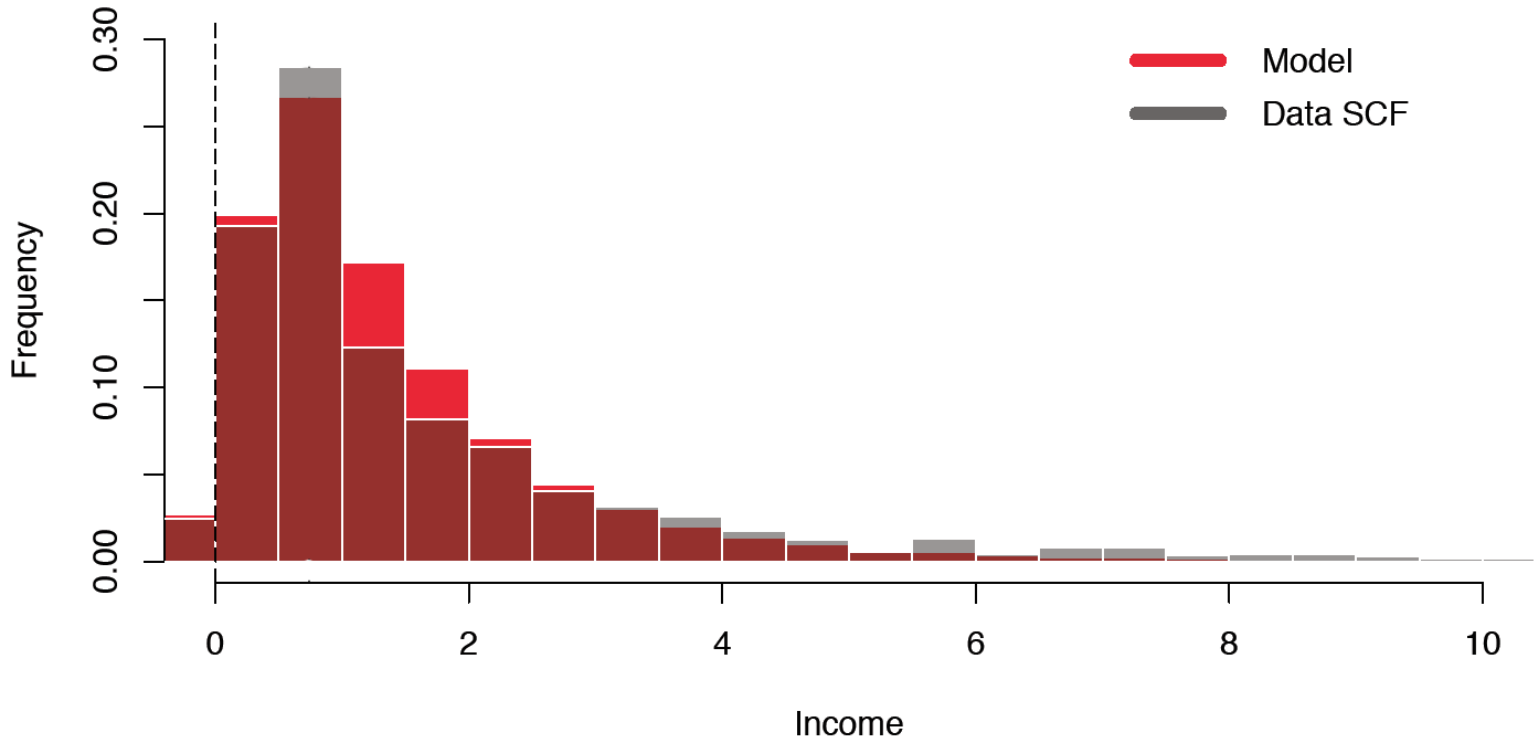


Figure: Distribution of normalized entrepreneurial earnings (ratio of wage plus business income to the median) .

- Right skewed distribution consistent with actual entrepreneurial risk.

Policy experiment

In the spirit of French PARE program: insure new entrepreneurs previously insured unemployed (with UI rights).

- Partial Downside Risk Insurance (DRI)
  1. **Keeping UI rights:** in case of failure, preserve their UI rights when returning to the unemployment pool.
  2. **Compensation $b_e(\theta, \pi_r)$ that guarantees at least UI benefits** in case of low entrepreneurial income π_r.

- Start-Up Subsidy (SUS)
  - **additional amount of wealth** S provided to the new entrepreneur

Policy: DRI

Characterized by **duration** q and insurance **replacement rate** f

$$b_e(\theta,\pi_r) = \begin{cases} b(\theta) & \text{if} \quad \pi_r < 0 \\ b(\theta) - (1-f)\pi_r & \text{if} \quad 0 \leq \pi_r \leq \frac{b(\theta)}{1-f} \\ 0 & \text{if} \quad \pi_r > \frac{b(\theta)}{1-f} \end{cases} \quad \textit{with} \quad b(\theta) = (1-\tau_w)h(\theta)w\mu$$

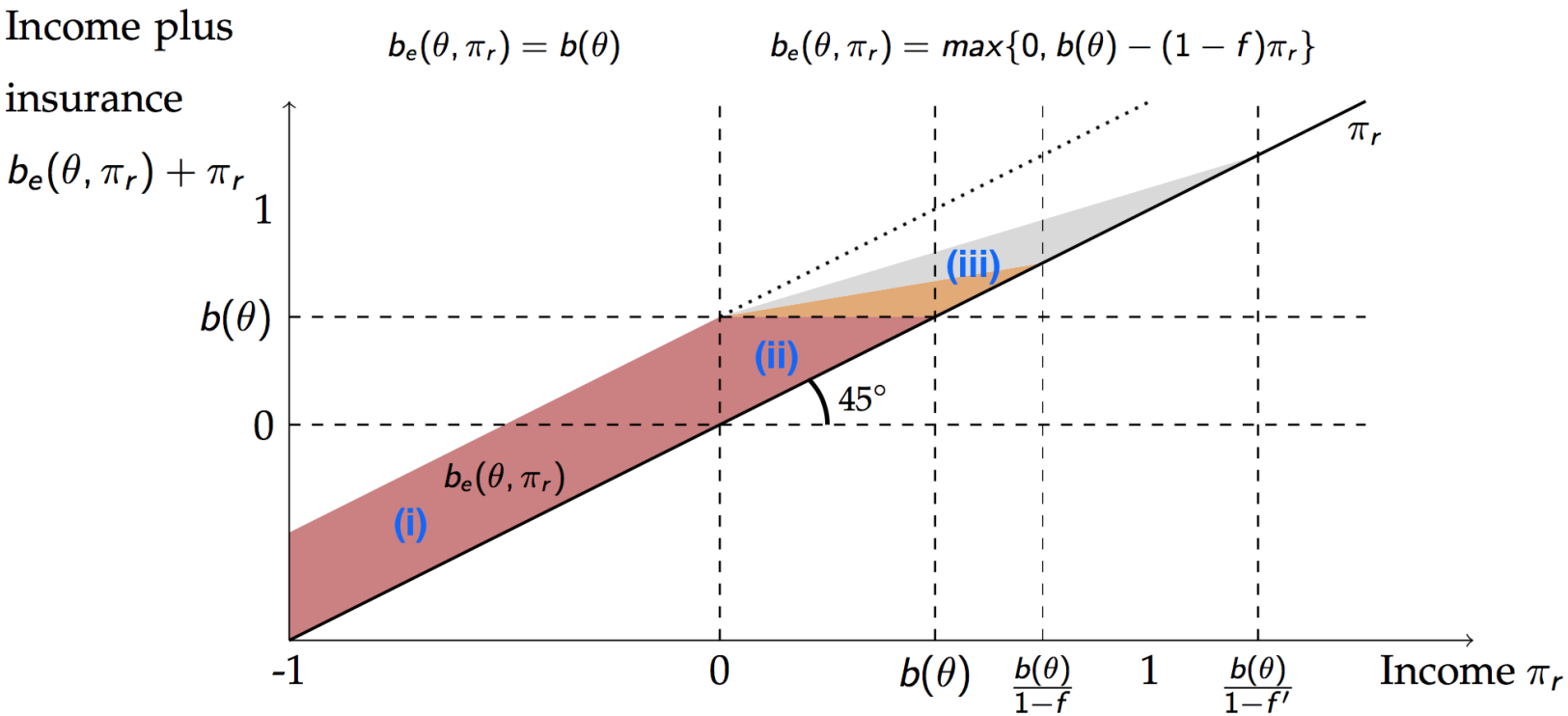


Figure: DRI policy. Red: $f = 0$, Orange $f = 0.3$, Grey: $f = 0.45$, White: $f \to 1$.

(i) full benefits if $\pi_r < 0$, (ii) full UI if $0 < \pi_r < b(\theta)$, (iii) "subsidy" if $b(\theta) < \pi_r < \frac{b(\theta)}{1-f}$

Results: policy experiments

- Standard implementation for DRI is $(f, q) = (0.3, 0.5)$
  - q is set to match US UI duration
  - f is set to the value adopted in France. We conduct robustness on this,

- To make DRI and SUS comparable, the subsidy amount S is adjusted to generate the same share of entrepreneurs between the two policies.

Results: policy experiments

	DRI (% deviation)	**SUS** (% deviation)
prob. U $\rightarrow$ E	**10**	**18**
Ent. exit rate	**1.64**	**3.76**
unemp. rate	-0.07	**-0.43**
New ent. per year	**2.5**	**4.4**
Ent. sector production	**0.9**	0.6
Tax rate τ_w	2.5	1.8
Ratio cost/GDP	0.0032	0.0026

Table: Effects on mobility and aggregates of the two policies, expressed as % deviation from the baseline economy.

- Large mobility effects on unemployed individuals.
- DRI policy is slightly more expensive tax wise (but similar over production),

Results: policy experiments - quality of entrepreneurs

% of entrepreneurs	θ_1	θ_2	θ_3
Baseline	11.60	7.55	7.24
DRI	+0.66	+1.11	**+1.38**
SUS	**+1.30**	+0.98	+0.66

Table: Percent increase (relative to the baseline economy) in the share of entrepreneurs by ability groups under different reforms.

- Resorbing the bias due to the UI system favours skilled groups.
  - High-skilled: **high opportunity cost of abandoning their UI rights**.
  - **low-skilled:**, on average, are too **financially constrained** to run businesses even under DRI (not the case with SUS).

Results: policy experiments - performance

5 years average	**Baseline**	**Counterfactual**		**Selected**	
		DRI	SUS	DRI	SUS
$g(\theta)$ (skill)	0.079	0.079	0.079	0.084	0.075
Wealth	12.64	12.71	12.68	9.94	8.11
Production	0.952	0.954	0.954	0.944	0.691
Production growth (in %)	2.83	3.02	2.41	2.41	2.1
Survival rate at 5 years (in %)	32.09	32.21	32.06	15.20	20.81

Table: Performance and quality of entrepreneurs. *Notes:* all values are an average over 5 years, except for the survival rate at 5 years.

- **Counterfactual:** people entering entrepreneurship even without DRI in baseline.
- **Selected:** only people entering entrepreneurship because of the policies

Results: policy experiments - insurance components

	Baseline	**DRI**	**No compensation**	**f = 0**
% of entrepreneurs	8.5	1.01	**0.42**	0.97
prob. U $\rightarrow$ E (in %)	2.3	9.7	**7.1**	9.3
Tax rate τ_w (in %)	0.91	2.53	**0.11**	2.53
Ratio cost/GDP	-	0.017	0	0.017

Table: DRI effects under three different assumptions in % deviation from baseline.

- **No compensation:** only offered the possibility to return to unemployment and claim UI,
  - impact is still important, resorb part of the bias towards employment.
- **f = 0**: no subsidy part in DRI, no compensation above initial UI.
  - plays a small role, results are close to the full DRI experiment.

Results: What else ?

- We compute transitional dynamics,
- We compute welfare gains both at steady state and with transitions: **both policies are implementable welfare wise**,
- We conduct robustness and consider alternative policy specifications concerning bankruptcy, shocks, risk aversion, etc.

Conclusion

1. GE theoretical framework with occupational choice, which accounts for heterogeneity in wealth and ability.
2. Occupational flows are realistic and close to their data counterparts.
3. Downside Risk Insurance for unemployed workers
   - Helps resorb the bias of the current UI system,
   - Increases the fraction of unemployed starting a business by 10%,
   - Benefits to high-skilled and richer individuals as compared to SUS.

Results: transition flows by educational attainment

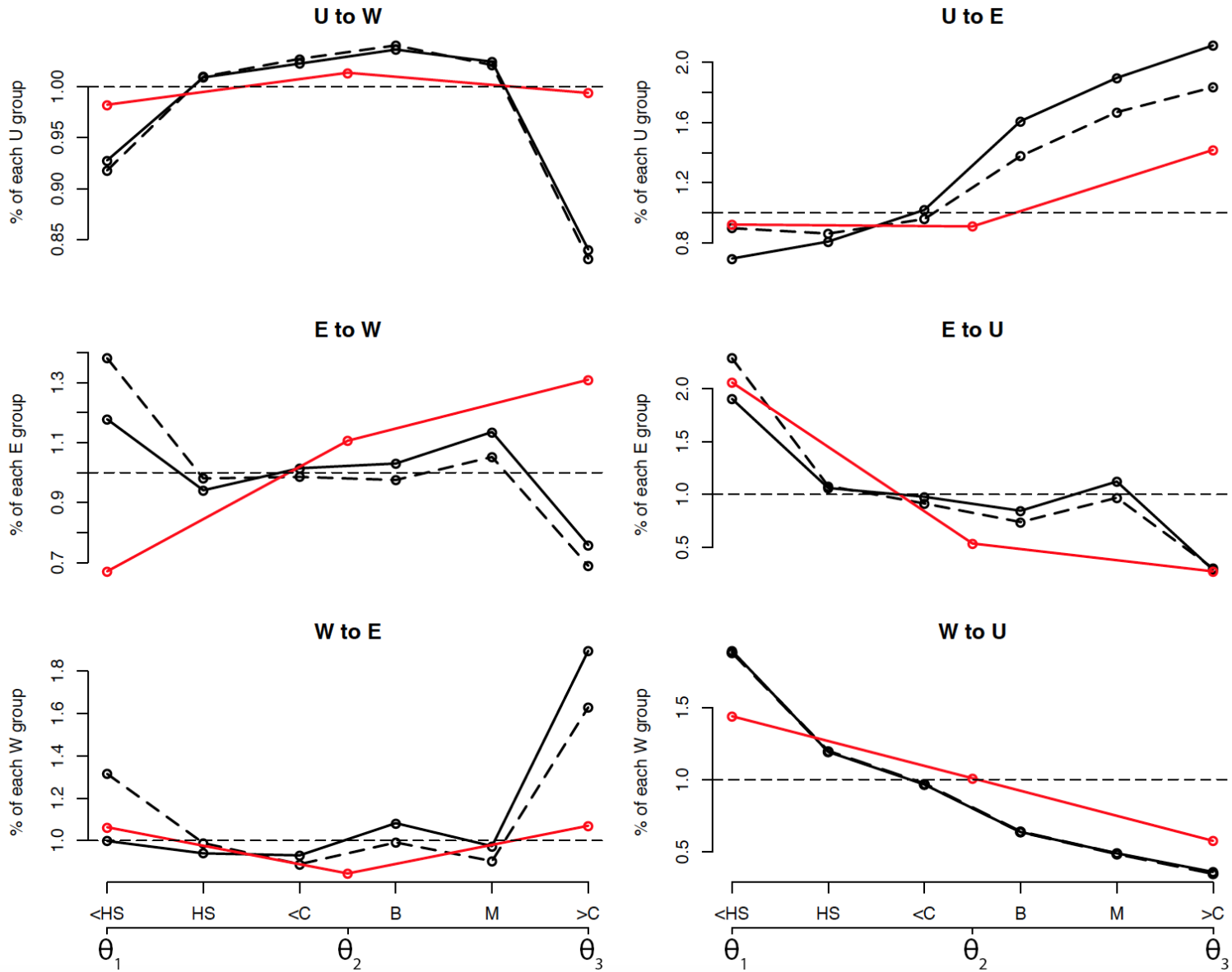


Figure: Transition flows by educational attainment for self-employed (dashed line), self-employed business owners (solid black line) and model (red) using θ.

Program of the entrepreneur non-excluded

return

$$R(a,k,\theta,z,j) = \max_{c,a',s_w} u(c,s_w,0) + \beta \mathbb{E}_{\theta',y',j'} \Big\{ \pi_w \max\{W', E'_{j'}\} + (1-\pi_w)\max\{U'_{j'}, E'_{j'}\} | \theta, j \Big\} \quad (1)$$

$$\text{s.t.} \quad \pi_r^A = z g(\theta)(k)^\nu - \delta k - r^b(\Delta)(k-a)\mathbb{1}_{\{k \geq a\}} \quad (2)$$

$$c + a' = \pi_r^A + \mathbb{1}_{\{j=i\}} b_e(\theta, \pi_r^A) + a + r^d(a-k)\mathbb{1}_{\{k \leq a\}} \quad (3)$$

$$B(a,k,\theta,z,j) = \max_{c,a',s_w} u(c,s_w,0) + \beta \mathbb{E}_{\theta',y',j'} \Big\{ \pi_w W' + (1-\pi_w) U'_{j'} \mid \theta, j \Big\} \quad (4)$$

$$\text{s.t.} \quad \pi_r = z g(\theta)(k)^\nu - \delta k \quad (5)$$

$$c + a' = \max\{(1-\chi)k + \pi_r - \xi(k-a), 0\} + \mathbb{1}_{\{j=i\}} b_e(\theta, \pi_r) \quad (6)$$

$$E(a,\theta,z_{-1},e=A,j) = \max_k \Big\{ \sum_{z \in \mathcal{Z}} \pi_z(z|z_{-1}) \max\{B(a,k,\theta,z,j), R(a,k,\theta,z,j)\} \Big\} \quad (7)$$

$$\text{s.t.} \quad (k-a) \leq \lambda a \quad (8)$$