

# Self-employment as Self-insurance

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# Microenterprises in developing countries ...



- Informal, small, don't grow/innovate
- Matter for aggregates

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- Informal, small, don't grow/innovate
- Matter for aggregates
- Coexist with weak social safety nets, no unemployment insurance
- Brief self-employment spells
- Large self-employment inflows/outflows

# Microenterprises in developing countries as an escape from unemployment

*Necessity microentrepreneurs*: start firms due to a lack of employment opportunities

	% Microentrepreneurs	% Workforce
Armenia	18.1	2.8
Brazil	32	9.1
Central African R.	7.7	-
Chile	16	4.1
Colombia	39	17
Congo, D.R.	19.5	6.4
Georgia	22.4	4.5
India	4.7	2.8
Iraq	24.2	6.4
Mexico	15	4.7
Mozambique	12.9	6.5
United States	3.8	0.26

# This Project

**Empirics:** uses microenterprise surveys to document novel facts on microentrepreneurship as income of last resort.

**Model:** (micro) entrepreneurship + labor market frictions

**Quantitative exercises:**

1. Enforcement of taxes/regulations
2. Introducing unemployment insurance

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# Environment

Entrepreneurship model + labor market frictions

(Gaillard and Sumudu 2024; Herreño and Ocampo 2023)

**Production:** modern (large, formal) and traditional (small, informal) sectors. All microentrepreneurs operate in the traditional sector, subject to collateral constraints.

**Agents:** risk averse, borrowing constrained, like consumption and dislike search effort. Bi-dimensional ability ( $\theta_W, \theta_S$ ) determines earnings.

**Occupations:** Three occupations: wage earners ( $W$ ), microentrepreneur in traditional sector ( $S$ ), and unemployed ( $U$ ).

**Labor markets:** free entry into  $S$ ,  $U$ . Access to  $W$  subject to search frictions.

# Production, labor market and skills

Modern sector firm:

$$\max_{K_M, N_M} A_M (K_M^\alpha N_M^{1-\alpha}) - (r + \delta_k)K_M - w(1 + \tau)N_M.$$

Traditional sector microentrepreneurs:

$$\pi(\theta_S, a) = \max_{k, n} \left\{ \theta_S (k^\alpha n^{1-\alpha})^\eta - (r + \delta_k)k - wn \right\} \text{ s.t. } k \leq \lambda a.$$

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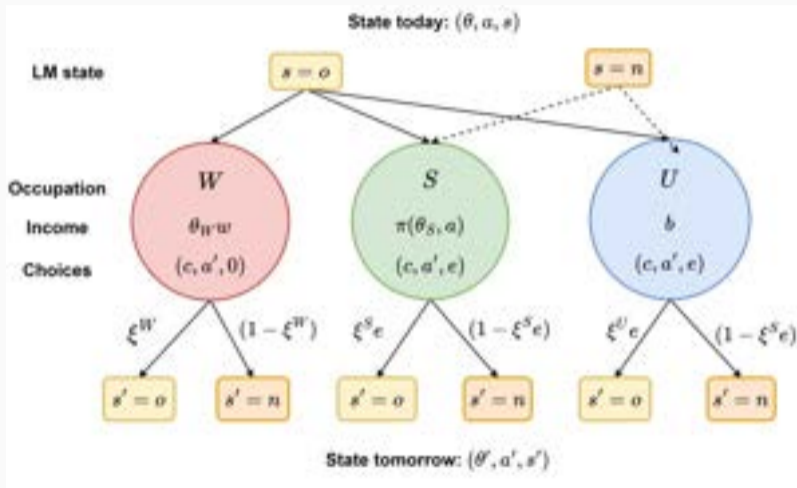
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Bi-dimensional ability:

$$\log(\theta'_W) = \rho_W \log(\theta_W) + \epsilon_W, \quad \log(\theta'_S) = \rho_S \log(\theta_S) + \epsilon_S,$$

# The agent's problem

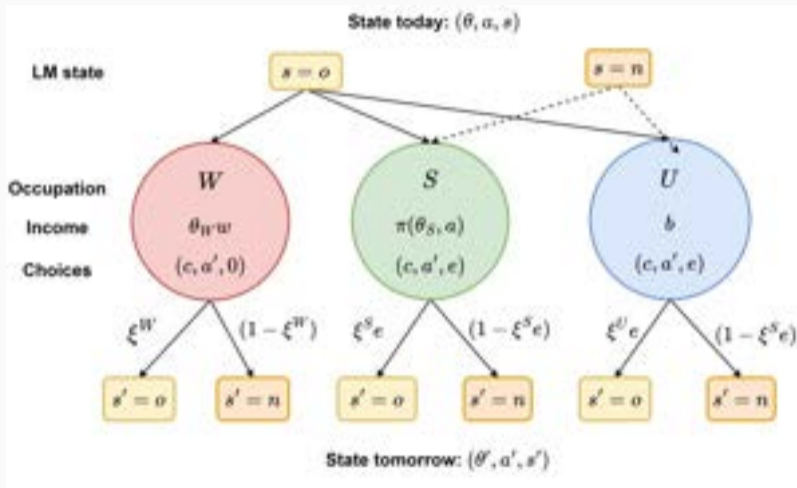
▶ value functions



$$\text{Occupational choice: } V(\theta, a, s, \varepsilon) = \max_{j \in G(s)} \left\{ v^j(\theta, a) + \varepsilon^j \right\}$$

# The agent's problem

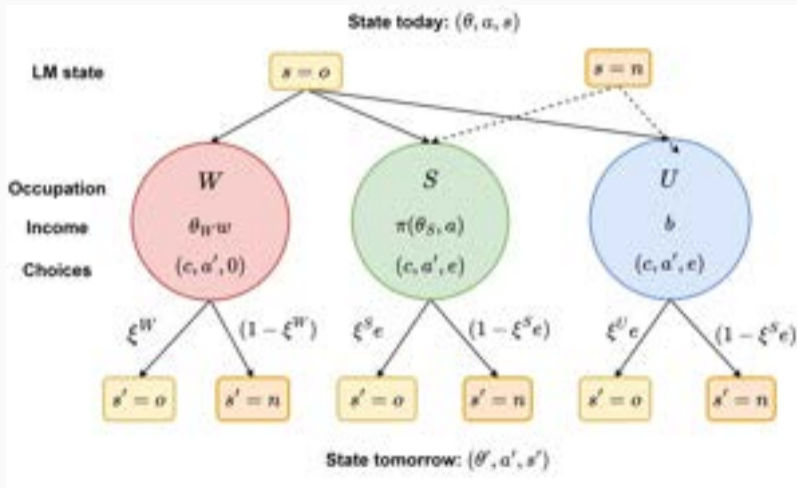
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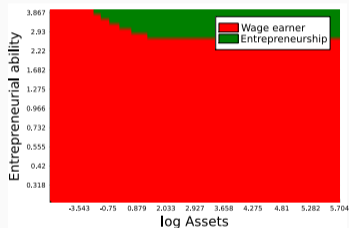
*Necessity entrepreneurs*: start firms because wage employment is unavailable

# The agent's problem

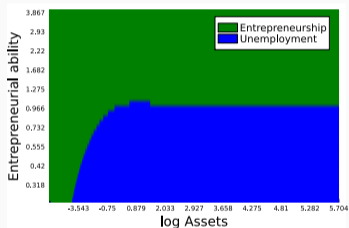
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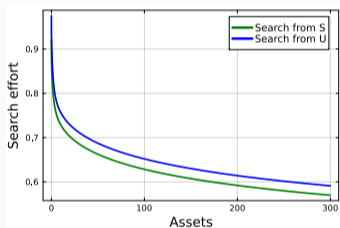
Key tradeoff: income today at the cost of lower arrival of offers tomorrow ( $\xi^S < \xi^U$ )



Occupational Map,  $s = 0$

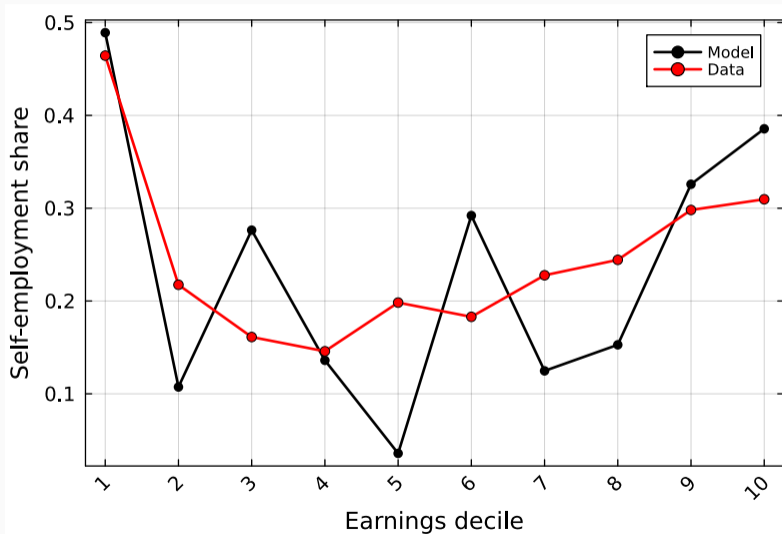


Occupational Map,  $s = n$

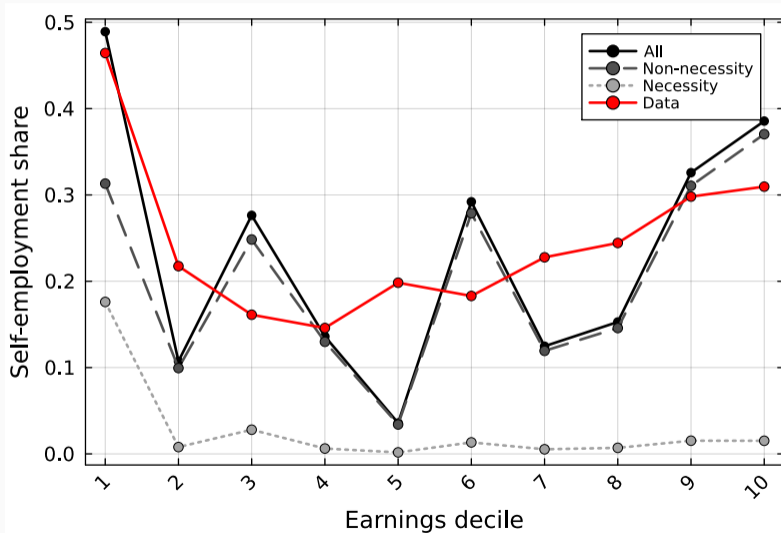


Search effort,  $\xi^S < \xi^U$

# Self-employment and earnings



# Self-employment and earnings



# Aggregate consequences of enforcement

**Literature:** stricter enforcement of taxes and regulations among informal firms may generate sizable productivity/output gains.

Bobba, Flabbi, and Levy (2022), Bobba, Flabbi, Levy, and Tejada (2021), D'Erasmus and Moscoso Boedo (2012), Dix-Carneiro et al. (2024), Leal Ordóñez (2014), Meghir, Narita, and Robin (2015), and Ulyssea (2018)

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If enforcement makes microenterprises not viable it may curtail consumption smoothing.

Focus on enforcement of *entry regulations*.

- Formal entry costs in Mexico estimated at 18% of per capita GNI (World Bank).
- Full enforcement scenario: microentrepreneurship entry requires payment  $\kappa_e$ .
- Consider 3 scenarios
  1. Entry costs only
  2. Entry costs + better access to credit (D'Erasmus and Moscoso Boedo 2012)
  3. Entry costs + increase in modern sector TFP (Meghir, Narita, and Robin 2015)

# Aggregate consequences of enforcement

Variable	Benchmark	$\kappa_e$	$\kappa_e + \lambda$	$\kappa_e + A_M$
<i>Aggregates (% change from benchmark)</i>				
Wage earners, $w$	0.73	5.9%	4.7%	7.8%
Entrepreneurs, $s$	0.22	-24%	-20%	-30%
Unemployed, $u$	0.048	21%	21%	21%
Output	3.8	0.54%	1.2%	6.2%
Output (Modern)	2.3	7.8%	3.4%	22%
Output (Traditional)	1.5	-11%	-2.3%	-19%
Capital to GDP ratio	1.9	5.1%	2.9%	8.7%
Std. Dev. of Consumption	0.4	9.3%	7.7%	12%
<i>Welfare Changes</i>				
Incoming cohort, $\varphi_0$	–	-4.3	-3.3	0.82
Wage earners, $\varphi_W$	–	-3.3	-2.4	0.95
Self-employed, $\varphi_S$	–	-2.8	-1.1	-0.20
Unemployed, $\varphi_U$	–	-3.3	-2.5	0.81

$\kappa_e$  equals *half* of WB's estimated formal entry cost

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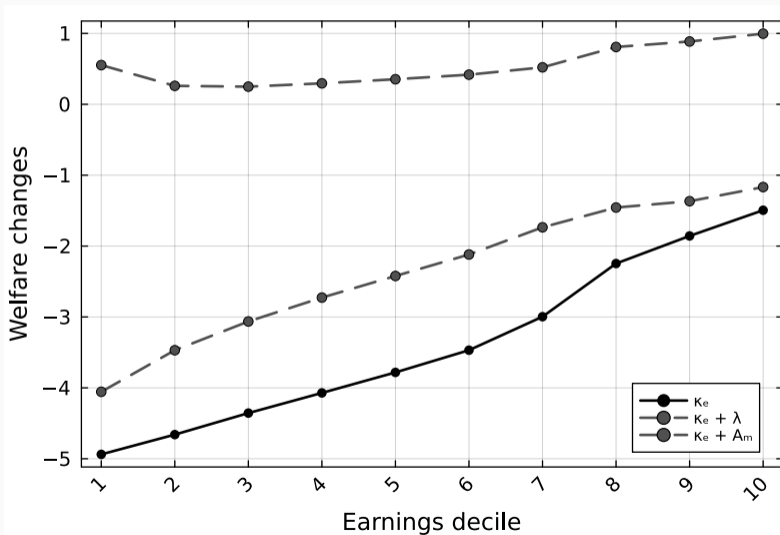
$\lambda$  increases from 1.1 to 1.4

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5% modern TFP increase (Meghir, Narita, and Robin 2015)

# Aggregate consequences of enforcement



# This Project (takeaways)

**Model:** (micro) entrepreneurship + labor market frictions

## **Enforcement of taxes/regulations**

- Might hurt welfare despite substantial output gains.
- Effects unequally distributed among the population.

## **In the paper:**

- New facts about necessity microentrepreneurs
- Introducing unemployment insurance

THANK YOU!

# Appendix

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Variable	
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N	35,368
Women (%)	40.43
Age (years)	43.31
College (%)	15.06
Weekly Hours	53.00
Tenure (years)	10.03
Employer (%)	20.75
Workforce size	1.74
Median Profits	0.89
Median Capital	3.61
Written Contract (%)	4.10
Registration (%)	38.84
Independent Establishment (%)	43.31
Location at Home (%)	22.02
Bookkeeping (%)	42.53

Nominal variables are expressed relative to median wages. Source: ENAMIN.

Variable	All	Opportunity	Necessity
N	35,368	31,053	4,315
Women (%)	40.43	42.52	25.40
Age (years)	43.31	43.15	44.51
College (%)	15.06	15.28	13.44
Weekly Hours	53.00	52.99	53.08
Tenure (years)	10.03	10.20	8.83
Employer (%)	20.75	21.62	14.51
Workforce size	1.74	1.77	1.52
Average Profits	1.33	1.37	1.05
Median Profits	0.89	0.89	0.82
Average Capital	20.29	21.29	12.89
Median Capital	3.61	3.71	2.52
Written Contract (%)	4.10	4.25	2.80
Insurance (%)	9.25	9.75	4.98

Nominal variables are expressed relative to median wages. Source: ENAMIN.

Summary statistics of Mexican microentrepreneurs

Industry	Share (%)
Retail trade: food, beverages, tobacco	19.28
Food/beverage preparation services	9.26
Food industry	5.35
Auto/truck repair	4.93
Construction: masonry, plumbing, etc.	4.74
Street food/beverage preparation	4.01
Personal services	4.00
Retail: stationery, recreational items	3.89
Retail: textiles, clothing, footwear	3.55
Street food/beverage vending	3.37
Professional, scientific services	3.34
Equipment/household repair	3.26
Residential construction	3.02
Retail: appliances, computers	2.09
Garment manufacturing	2.02

## Main Reason for Business Start Up, Mexico 2010

	Reason	Proportion (%)
01	By family tradition	8.30
02	To supplement family income	7.53
03	To improve income	27.80
04	Could not find salaried work	13.90
05	Needed a flexible schedule	0.90
06	Job loss or reduction at previous employment	1.93
07	Found a good business opportunity	9.37
08	To practice their trade, career, or profession	8.20
09	Has knowledge or experience in the business or activity	8.14
10	Enjoys the activities of the business	8.82
11	Other reasons	5.12

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11	Other reasons	5.12

*Necessity entrepreneurs (NE):* **04 + 06**

*Opportunity entrepreneurs:* everyone else

	Reason	Proportion (%)
01	By family tradition or inheritance	7.39
02	To supplement family income	19.82
03	To improve income	25.00
04	Had money and found a good opportunity	5.37
05	To practice their trade, career, or profession	11.87
06	It was the only way to earn an income	10.94
07	Lacked the required job experience for a job	0.36
08	Lacked the necessary education or training for a job	0.41
09	Overqualified for a job	0.06
10	Found poorly paid jobs	1.33
11	Needed a flexible schedule	1.65
12	No employment opportunities were available	5.80
13	Other reasons	10.00

Main Reason for Starting a Business

Code	Reason	Proportion (%)
1	Couldn't find employment	34.5
2	Had the opportunity to form a partnership	1.83
3	Wanted a flexible schedule	0.65
4	Wanted to be independent	19.4
5	Family tradition	10.6
6	To supplement family income	5.89
7	Had experience acquired from another job	11.6
8	Believed the business was advantageous	8.88
9	This was a secondary job that became primary	2.39
10	Other	4.24

Main Reason for Starting a Business

Code	Reason	Proportion (%)
1	Family tradition / inheritance	10.6
2	Couldn't find a job as an employee	10.9
3	Was laid off from an employee job	9.46
4	To earn enough income for basic needs	9.49
5	Wanted to start their own business or independent activity	22.7
6	Found an opportunity in the market	8.9
7	Has greater flexibility (schedule, workplace, etc.)	6.45
8	To make their own decisions / be their own boss	8.75
9	Expected higher income compared to their previous occupation	6.51
10	Family responsibilities	1.47
11	For health reasons	2.2
77	Other, please specify	2.64

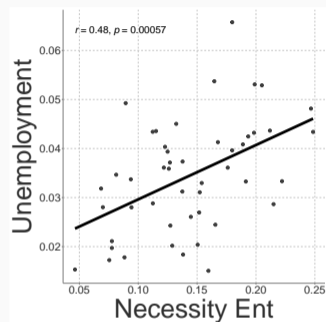
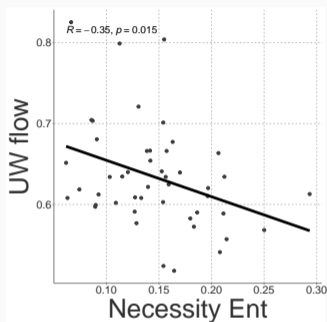
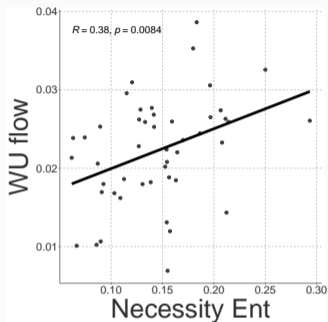
Main Reason for Starting a Business

Code	Reason	Proportion (%)
1	Had no other income alternative	40.5
2	Identified it as a business opportunity in the market	33.6
3	By family tradition or inheritance	4.94
4	To supplement family income or improve income	3.7
5	To practice their trade, career, or profession	15.1
6	Lacked the required job experience, education, or training	1.59
7	Other, specify	0.54

Main Reason for Starting a Business

# Fact 1: NE is higher in cities where workers struggle to find/keep jobs

▶ Back



positively correlated with wage employment exit rates

negatively correlated with job finding rates

positively correlated with unemployment

## Fact 2: NE negatively correlates with performance

[▶ summary statistics](#)[▶ spells](#)[▶ Back](#)

Results of  $y_i = \alpha \text{Necessity}_i + X_i\beta + \varepsilon_i$

<b>Dependent variable</b>	$\hat{\alpha}$
<i>log(profits)</i>	-0.115*** (0.011)
<i>log(capital)</i>	-0.472*** (0.023)
<i>isEmployer</i>	-0.223*** (0.025)
<i>nEmployees</i>	-0.104*** (0.013)
<i>tenure</i>	-2.345*** (0.103)

Controls: education, demographics, firm characteristics. Time and location fixed effects.

Necessity entrepreneurs create smaller, less profitable businesses. Have shorter tenures.

## Fact 3: NE benefit more from switching into wage employment

[▶ Back](#)

$$\omega_{i,t+1}^W - \omega_{i,t}^S = \alpha \text{Necessity}_i + X_i \beta + \varepsilon_i,$$

- $\omega_{i,t}^j$ : log hourly earnings of agent  $i$  in occupation  $j$  in period  $t$
- $\hat{\alpha} > 0$  indicative of a **comparative disadvantage** at  $S$ .

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	<i>Dependent variable:</i>			
	$\omega_{t+1}^W - \omega_t^S$			
	(1)	(2)	(3)	(4)
$\hat{\alpha}$	0.188*** (0.022)	0.191*** (0.022)	0.192*** (0.022)	0.120*** (0.025)
Demographic controls	✓	✓	✓	✓
Time fixed effects	X	✓	✓	✓
Location fixed effects	X	X	✓	✓
Firm controls	X	X	X	✓
Observations	18,374	18,374	18,300	14,553

## Previous and next labor market spells

	Opportunity	Necessity
<i>Where do they come from</i>		
inactive	29.4%	20.1%
unemployed	4.5%	9.3%
wage earner	66.1%	70.5%
<i>Where do they go</i>		
inactive	29.6%	20.8%
unemployed	5.2%	9.5%
wage earner	65.2%	69.7%

Modern sector firm:

$$\max_{K_M, N_M} A_M (K_M^\alpha N_M^{1-\alpha}) - (r + \delta_k)K_M - w(1 + \tau)N_M.$$

Traditional sector entrepreneurs:

$$\pi(\theta_S, a) = \max_{k, n} \left\{ \theta_S (k^\alpha n^{1-\alpha})^\eta - (r + \delta_k)k - wn \right\} \text{ s.t. } k \leq \lambda a.$$

Bi-dimensional ability determines occupational returns:

$$\log(\theta'_W) = \rho_W \log(\theta_W) + \epsilon_W, \quad \log(\theta'_S) = \rho_S \log(\theta_S) + \epsilon_S,$$

for  $(\epsilon_W, \epsilon_S) \sim N(0, \Sigma)$ .

$$\begin{aligned}
 v^W(\theta, a) &= \max_{a' \geq 0} \left\{ \log(w\theta_W + (1+r)a - a') + \right. \\
 &\quad \left. \beta(1-p)\mathbb{E}_{\theta, \varepsilon} \left[ \xi^W V(\theta', a', o, \varepsilon') + (1 - \xi^W)V(\theta', a', n, \varepsilon') \right] \right\} \\
 v^S(\theta, a) &= \max_{e \in [0,1], a' \geq 0} \left\{ \log(\pi(\theta_S, a) + (1+r)a - a') - \chi \frac{e^{1+\phi}}{(1+\phi)} + \right. \\
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 v^U(\theta, a) &= \max_{e \in [0,1], a' \geq 0} \left\{ \log(b + (1+r)a - a') - \chi \frac{e^{1+\phi}}{(1+\phi)} + \right. \\
 &\quad \left. \beta(1-p)\mathbb{E}_{\theta, \varepsilon} \left[ \xi^U e V(\theta', a', o, \varepsilon') + (1 - \xi^U e)V(\theta', a', n, \varepsilon') \right] \right\}
 \end{aligned}$$

Moment	Data	Model
$W \rightarrow W$	0.91	0.91
$W \rightarrow S$	0.06	0.08
$W \rightarrow U$	0.02	0.02
$S \rightarrow W^*$	0.21	0.21
$S \rightarrow S$	0.78	0.70
$S \rightarrow U$	0.02	0.08
$U \rightarrow W^*$	0.59	0.61
$U \rightarrow S$	0.13	0.13
$U \rightarrow U$	0.27	0.26

\* Targeted in calibration.

Model fit, labor market flows

For given government policy  $(\tau, b)$ , a (stationary) competitive equilibrium in this environment consists of input prices  $(w, r)$ , value functions  $(V, v^W, v^S, v^U)$ , policy functions  $(g_a^j, g_e^j)$  for  $j \in \{W, S, U\}$  and measures  $(\mu^W, \mu^S, \mu^U)$  such that:

1. Given input prices  $(w, r)$ , the modern sector firm maximizes her profits.
2. Given input prices  $(w, r)$ , policy functions  $(g_a^j, g_e^j)_{j \in \{W, S, U\}}$  constitute a solution for the functional equations defining the agent's problem.
3. Input markets clear:

$$N_M + N_T = \int \theta_W d\mu^W(\theta, a, \beta), \quad K_M + K_T = \int a d\mu(\theta, a, \beta),$$

for  $\mu = \mu^W + \mu^S + \mu^U$ .

4. The government budget is balanced.
5. Measures  $(\mu^W, \mu^S, \mu^U)$  comply with

$$1 = \int d\mu^W(\theta, a, \beta) + \int d\mu^S(\theta, a, \beta) + \int d\mu^U(\theta, a, \beta).$$

Moment	Data	Model
$L_M/(L_M + L_T)$	0.73	0.72
Share of entrepreneurs $s$	0.25	0.22
Earnings ratio (entrepreneurs/workers)	0.87	0.81
Dispersion of log wages	0.51	0.53
Dispersion of log profits	0.87	0.92
Autocorrelation of log wages	0.56	0.57
Autocorrelation of log profits	0.53	0.67
Unemployment rate $u$	0.045	0.048
$U \rightarrow W$ transition rate	0.59	0.61
$S \rightarrow W$ transition rate	0.21	0.21
Capital to GDP ratio	2.2	1.9
Standard deviation of consumption	0.53	0.40

**Table 1:** Model fit, targeted moments

Parameter		Value
$\rho$	Probability of death	$(4 \times 100)^{-1}$
$\alpha$	Capital share	0.35
$\delta_k$	Depreciation rate (annual)	0.06
$\lambda$	Collateral constraint	1.1
$(1 - \xi^W)$	Job destruction rate	0.04
$\xi^U$	Offer arrival rate from $U$	0.8
$b$	Unemployment income	$w \times 10^{-5}$
$\tau$	Payroll tax	0.0
$\beta_\varepsilon$	Shift parameter, taste shocks	$5 \times 10^{-3}$

**Table 2:** Externally Calibrated Parameters

Parameter		Value
$A_M$	Modern sector productivity	0.94
$\eta$	Decreasing returns	0.60
$\sigma_w^2$	Variance of skill innovations, $W$	0.22
$\rho_w$	Autocorrelation of skill innovations, $W$	0.61
$\sigma_s^2$	Variance of skill innovations, $S$	0.31
$\rho_s$	Autocorrelation of skill innovations, $S$	0.76
$\rho_{SW}$	Correlation of skill innovations	-0.62
$\xi^S$	Job offer arrival rate, $S$	0.68
$\chi$	Search cost, intercept	19
$\phi$	Search cost, convexity	11
$\bar{\beta}$	Discount factor midpoint	0.96
$\epsilon$	Discount factor dispersion	0.04
$g$	Government expenditure	0.048

Note: Government expenditure equals revenue from accidental bequests.

**Table 3:** Internally Calibrated Parameters

	Data	Model
<i>Necessity Entrepreneurs</i>		
Necessity entrepreneurship (%)	15	13
Relative capital stock (%)	60	47
Relative profits (%)	77	44
<i>Firm Size Distribution</i>		
$K_M/(K_M + K_T)$	0.75	0.84
$K_{25}$	0.74	2.79
$K_{50}$	3.85	6.14
$K_{75}$	15.13	12.35

Untargeted Moments

Utilitarian welfare of an incoming cohort (Krueger, Mitman, and Perri 2016):

$$\varphi_0 = \exp \left( \left[ \tilde{\mathbb{V}} - \mathbb{V} \right] \times \mathbb{E}_\beta \left[ \frac{1}{(1 - (1 - \rho)\beta)} \right]^{-1} \right) - 1,$$

with  $\mathbb{V} = \int \mathbb{E}_\varepsilon (V(\theta, \mathbf{a}, \mathcal{J}, \varepsilon; \beta)) d\mu_0(\theta, \mathbf{a}, \beta)$  and  $\mu_0$  the starting distribution of new cohorts.

Consumption equivalent change:

$$\varphi(\theta, \mathbf{a}, \mathcal{J}; \beta) = \exp \left( \mathbb{E}_\varepsilon \left( \tilde{V}(\theta, \mathbf{a}, \mathcal{J}, \varepsilon; \beta) - V(\theta, \mathbf{a}, \mathcal{J}, \varepsilon; \beta) \right) \times (1 - (1 - \rho)\beta) \right) - 1.$$