

Wage Inequality and Entrepreneurship

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Motivation

- ▶ Wage inequality between different skill groups differ substantially across developed countries. Skill premium is high in the US and UK but low in most of continental Europe.
- ▶ Countries where barriers to entrepreneurship are lower have higher skill premium. Also in these countries entrepreneurship rates and firm entry rates are higher.
- ▶ 2 main views to explain this difference:
 - ▶ Differences in wage inequality is attributed to difference in labor market institutions.
 - ▶ Different relative labor supply.

Facts

	$\log \frac{w_{20}}{w_{10}}$			$\log \frac{w_{50}}{w_{50}}$			$\log \frac{w_u}{w_u}$
	1975-1984	1985-1994	1995-2005	1975-1984	1985-1994	1995-2005	1989
United Kingdom	0.99	1.17	1.26	0.49	0.58	0.65	0.41
United States	1.30	1.49	1.58	0.61	0.73	0.80	0.60
Continental Europe	0.95	0.96	0.99	0.56	0.57	0.60	0.32

	Procedures (number)	Time (days)	Cost (% of income per capita)	Min. capital (% of income per capita)
United Kingdom	6	13	1	0
United States	6	6	0.7	0
Continental Europe	8	38	11.4	46.3

- ▶ Wage inequality is high in US and UK but low in continental Europe.
- ▶ There was a big increase in wage inequality in US and UK and almost no changes in continental Europe.
- ▶ Continental Europe shows higher entry cost than US and UK.

Main Goal

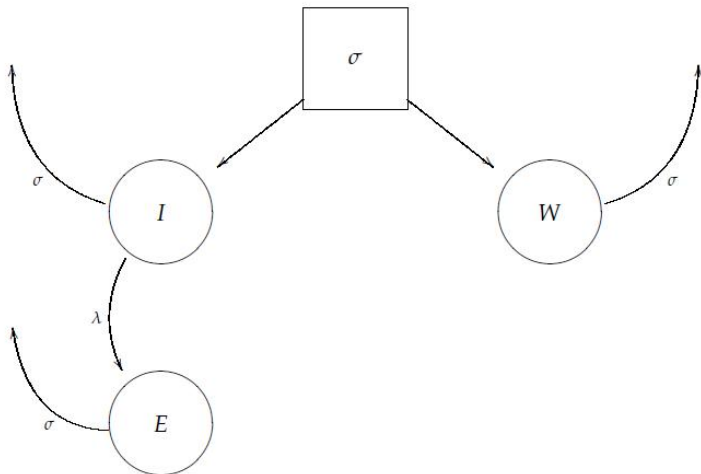
To provide a theory of wage inequality across skill groups that relies on the ability of individuals to leverage their talent, and explore the role of particular set of barriers to mobility of talents across occupations in the determination of equilibrium allocations and relative prices.

Preferences and technology

- ▶ Continuous time and infinite horizon.
- ▶ Continuum with mass N ($N = L_u + 1$) of risk-neutral agents.
- ▶ Discount rate is r .
- ▶ Agents born with different talent z , which are distributed according to $H(z)$ with density $h(z)$ and support $\zeta \subseteq \mathbb{R}_+$.
- ▶ Depending on their talent agents have access to different ideas distributed according to $G(\cdot|z)$.
- ▶ There is a single good produced by firms.

- ▶ Firms consists of an entrepreneur, capital and labor and is characterized by a a specific set of procedures whose productivity is drawn by the entrepreneur when the firm is started.
- ▶ Agents can either work for a firm or open up their own firm.
- ▶ A worker with ability z earns a wage $w(z)$ and an entrepreneur of firm with productivity x enjoy the net profit of their firm $\pi(x)$.
- ▶ Assume that while workers are looking for ideas are voluntary unemployed. Ideas are drawn at Poisson rate λ .
- ▶ The forgone wage is consider as entry cost.
- ▶ To open a firm there is a fix cost κ .
- ▶ Agents die and born at a rate σ
- ▶ Problem of the firm: $\max_{l_z, k} \pi(x) \equiv \underbrace{F(l, k, x)}_{y(x)} - \int w_z l_z dz - rk$

Flow across states



Value functions

- ▶ $rV_w(z) = w_z - \sigma V_w(z)$
- ▶ $rV_e(x) = \pi(x) - \sigma V_e(x)$
- ▶ $rV_i(z) = \lambda \int \max \{ V_e(x) - \kappa - V_i(z), 0 \} dG(x|z) - \sigma V_i(z) = \lambda \int_{R(z)} (V_e(x) - \kappa - V_i(z)) dG(x|z) - \sigma V_i(z)$
- ▶ Agents choose to be worker if $V_w(z) \geq V_i(z)$ and they choose to look for ideas if $V_i(z) \geq V_w(z)$

Equilibrium

- ▶ Let $i(z)$ be the mass of agents with talent z looking for an idea.
- ▶ $e(z)$ the mass of agents of talent z who are entrepreneurs.
- ▶ The evolution of entrepreneurs of talent z is given by $\dot{e}(z) = \lambda[1 - G(R(z)|z)]i(z) - \sigma e(z)$.
- ▶ Let L_z be the fraction of agents with talent z who are workers.
- ▶ $\mu(x)$ is the mass of firms with productivity smaller or equal to x and $\mu \equiv \int d\mu(x)$ the total mass of firms.
- ▶ $\mu(x)$ satisfies the following differential equation:

$$\dot{\mu}(x) = \lambda \int [G(x|z) - G(R(z)|z)]i(z)dH(z) - \sigma\mu(x)$$

Stationary Competitive Equilibrium

A Stationary competitive equilibrium is a $R(z)$, a set of prices w_z, r and values $V_e(x), V_i(z), V_w(z)$ together with measures $\mu(x), i(z), e(z)$ and L_z , and allocations $k(x), l_z(x)$ such that for any $z \in \zeta$:

1. $R(z)$ satisfies the entry condition $V_e(R(z)) - \kappa \geq V_i(z)$ with $=$ if $R(z) > x_{min}$; and
2. Solve the value functions.
3. The indifference conditions $V_w(z) = V_i(z)$.
4. The steady state condition $\dot{\mu}(x) = 0$
5. The resource constraints $e + i + L = N$, $\int l_z(x) d\mu(x) = L_z$, and $\int k_z(x) d\mu(x) = K$ are satisfied.

Characterization

- ▶ The characterization of the equilibrium depends crucially on the functional forms governing the production, $F(l, k, x)$ and the distributions of talents and ideas $H(z)$ and $G(.|z)$
- ▶ Assume that $F(l, k, x) = \left[\int w_z m_z^\rho dz \right]^{\frac{1-\alpha}{\rho}} k^\alpha$ where $m_z = [\psi_z x^{\gamma_z} + (1 - \psi_z)(A_z l_z)^{\gamma_z}]^{\frac{1}{\gamma_z}}$.
- ▶ The size of a firm with productivity x is given by $n(x) = \frac{x}{\bar{x}}$ where \bar{x} is aggregate productivity.
- ▶ Assume that $H(z)$ is degenerate and take 2 values $\{A_u, A_s\}$. This values are such that the unskilled will never become entrepreneur.
- ▶ The author state that an equilibrium exist, and if $\tilde{x} \equiv \frac{\int_y x dG(x)}{1-G(y)}, \frac{\partial \log \tilde{x}}{\partial \log y} \leq 1$ the equilibrium is unique.

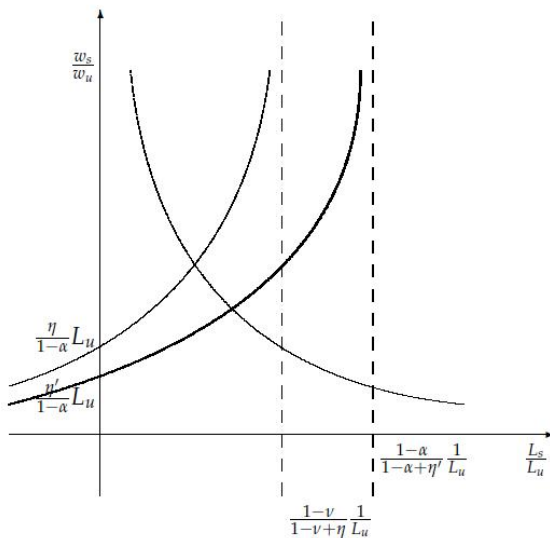
- ▶ Firm maximize profits by choosing employment so that the marginal rate of transformation between skilled and unskilled workers is equal to the relative prices,

$$\frac{w_s}{w_u} = \frac{F_{l_s}(l_s, l_u, k, x)}{F_{l_u}(l_s, l_u, k, x)}$$

- ▶ The author shows that by choosing specific values for some parameters (elasticity of substitution between types of labor, grade of complement of productivity and different type of labor) the production function can be written in the spirit of Lucas(1978).
- ▶ After some calculations we can write $\frac{w_s}{w_u} = \frac{1-\nu+2\eta}{1-\nu} L_u$ where ν is the exponent of capital in the production function and η is a measure of the entrepreneurial channel.

Comparative Statics

- ▶ **Lemma 1** The wedge η is a decreasing function of the reservation productivity, $\frac{\partial \eta}{\partial R} < 0$
- ▶ **Lemma 2** The reservation productivity is an increasing function of the entry cost, $\frac{\partial \eta}{\partial \kappa} > 0$
- ▶ A high entry cost reduces the incentive to open up firms and induces an increase in the quality of the ideas implemented.
- ▶ **Lemma 3** The supplied of skilled workers is an increasing function of the entry cost $\frac{\partial L_s}{\partial \kappa} < 0$. The skill premium is a decreasing function of entry cost, $\frac{\partial (w_s/w_u)}{\partial \kappa} < 0$. Moreover, the number of firms decreases when the cost of entry increase $\frac{\partial \mu}{\partial \kappa} < 0$



Results

- ▶ He log-linearized a version of the equation of relative prices for labor to use to match some data of US and EU and try to explain the wage differences.

$$\log \frac{w_s^{US}}{w_u^{US}} - \log \frac{w_s^{EU}}{w_u^{EU}} = -(1 - \zeta) \left[\log \frac{L_s^{US}}{L_u^{US}} - \log \frac{L_s^{EU}}{L_u^{EU}} \right].$$

- ▶ As unskilled labor is supplied inelastically we can write $\frac{L_s}{L_u} = \frac{1}{L_u}(1 - \theta) - \theta$ where $\theta \equiv \frac{e}{1+L_u}$
- ▶ He uses data of θ from the GEM.
- ▶ He finds that his model can predict between 34 and 92 of the skill premium difference between US and Europe.
- ▶ He also makes a counterfactual experiment using data from US and Italy. Setting the Italy entry rate to the US he gets a reduction in the skill premium but the increase in the entry cost needed to generate the entry rate are too high.

Conclusions

- ▶ The paper proposes a theory of wage inequality based on the barriers to entrepreneurship.
- ▶ High barriers to entrepreneurship decrease the outside option of skilled people reducing the skill premium.
- ▶ In the results he get that the predicted skill premium of Europe is lower than the one in the US.
- ▶ If US has the entry rate of Italy the skill premium in the US would decrease by 20 percent but the entry costs needed to generate it are too high.