Wage Inequality and Entrepreneurship

Job Market Paper

Federico De Francesco*
UCLA

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Abstract

This paper provides a theory of wage inequality that hinges on entrepreneurship. The theory is motivated by new empirical findings. Among them, I document that in countries where barriers to entrepreneurship are high, wage inequality is low. As noted in the literature, differences in wage inequality across countries are, to a great extent, determined by differences in the skill premium, defined as the ratio between the wage of college graduates and that of workers with at most a high school diploma. A high degree of education has been found to be a salient characteristic of people who are entrepreneurs. In a world in which skilled people can choose between a wage job and entrepreneurship, barriers to entry reduce the value of entrepreneurship and lower skilled workers' outside option. I formalize this idea in a simplified model of firms dynamics *à la* Hopenhayn (1992a) in which I introduce occupational choice in a general equilibrium setting. The model is parametrized on the entry rate of firms in the United States to match the observed skill premium assuming the cost of entry is zero. In a counterfactual exercise, the cost of entry in Italy is backed up by matching the entry rates in this country. Under the Italian entry rate, the model predicts for the U.S. a skill premium twenty percent lower than the actual one, accounting for more than a third of the difference in the observed skill premium between the two countries.

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1 Introduction

Wage inequality between different skill groups differ substantially across developed countries. The skill premium, defined as the wage of skilled labor relative to that of unskilled labor, is high in the United States and in the United Kingdom but low in most of the countries of continental Europe.

The debate around the causes of these cross-country differences is still open. In this paper, I contribute to the debate by putting forward a theory of the skill premium that hinges on entrepreneurship. The theory is motivated by new empirical findings. Countries where the skill premium is higher are countries where barriers to entrepreneurship are lower. In fact, countries where the skill premium is higher are countries where entrepreneurship rates and firm entry rates are higher.

The idea informing the theory is straightforward: skilled workers in countries like the U.S. or U.K., where barriers to entrepreneurship are low, have a higher outside option than their peers in countries like Italy or France, where those barriers are high. If not paid enough, skilled workers in the U.S. can open up their own business where they can realize their talent. High barriers to entrepreneurship reducing skilled workers' outside option, increase the relative supply of skilled workers and thus decrease their relative price.

The literature on the causes of cross-country differences in the skill premium has focused on two main hypotheses. The first attributes differences in wage inequality across skill groups to differences in labor market institutions, such as labor unions and wage centralization. For instance, Blau and Khan (1996) reach this conclusion rejecting the second hypothesis that higher relative wages are the result of a lower relative supply. Actually, measuring skills with education levels, they find that while net supply of low skilled workers in the U.S. is lower than in other countries, their relative wages are also lower.

However, as Leuven et al. (2004) point out, given substantial differences in educational systems across countries, using years of schooling to compare cross-country skill levels could generate misleading inferences[1]. In fact, using internationally comparable measures of cognitive skills across advanced countries, Leuven et al. find that relative prices and relative quantities supplied negatively co-vary.

The result in Leuven et al. suggests that, if wages reflect cognitive ability or talent broadly defined rather than years of schooling and if the underlying distribution of talent does not vary across countries, understanding differences in relative wages boils down to understanding the equilibrium allocation of talent in the economy.

[1]The U.S. has for example the highest average years of completed schooling of all countries included in their sample but ranks only 9 of 15 on the average cognitive ability test score.

I provide a theory of wage inequality across skill groups that relies on the ability of individuals to leverage their talent, as they can realize it in different occupations, and explores the role of a particular set of barriers to mobility of talents across occupations, namely barriers to entrepreneurship, in the determination of equilibrium allocations and relative prices[2].

Individuals are born with a talent they can exploit as workers in existing production processes. Moreover, in the spirit of Holmes and Schimtz (1990), individuals repeatedly through time have access to ideas that, upon the payment of a fixed cost, can be implemented in the form of new production processes. Each production process is characterized by a productivity that depends on the quality of the idea implemented. Motivated by the entrepreneurship literature, I assume individuals with different talents have access to ideas of different quality. In particular, I assume more talented individuals have access to more productive ideas.

The model economy is a simplified version of industry dynamics a la Hopenhayn (1992a) found in Melitz (2003) and Restuccia and Rogerson (2008), in which I introduce occupational choice in a general equilibrium setting. The equilibrium is analytically characterized under some assumptions as a fixed point. I provide a sufficient condition under which a unique equilibrium can be characterized as a function of a reservation productivity. The reservation productivity represents a lower bound on the quality of ideas implemented and I show the existence of a monotonic relation between the cost of entry and the reservation productivity that allows me to derive most of the comparative statics results.

The theory qualitatively replicates the stylized facts. Higher barriers to entrepreneurship, modeled by higher costs of entry, reduce both the entry rate and number of firms and increase the average firm size. Moreover, higher barriers to entry lead to a lower skill premium. High costs of entry reduce the incentive for more talented agents to become entrepreneurs and, by lowering their outside option, increase the supply of skilled workers. For a given demand, the increase in the supply of more talented workers decreases their wage. Moreover, high costs of entry reduce aggregate productivity. To the extent that workers' skills complement firms specific productivity, the reduction in aggregate productivity lowers the demand for skilled workers, strengthening the effect on the wage.

The model is explored numerically, in an attempt to assess quantitatively the relevance of the theory. Normalizing the cost of entry to zero, the model is calibrated to match the observed skill premium and firms entry rate in the United States. In a counterfactual exercise, the cost of entry in Italy is backed up by matching the entry rates in this country. Under an entry cost consistent with the Italian entry rate, the model predicts for the U.S. a skill premium twenty percent lower than the actual one, accounting for approximately forty percent of the difference in the observed skill premium between the two countries.

[2]This paper does not address the issue pertaining the acquisition of skills by different talent groups and I thus use the terms cognitive ability, skill and talent interchangeably.

While the theory is informed by static cross-country evidence, it also offers a framework to analyze the evolution of the skill premium over time. In cross-country data, I document that changes in the returns to entrepreneurship, measured by the fraction of total income reported as business income, are highly correlated over time with changes in the skill premium. Despite displaying diverse paths for business income, I document that this correlation holds in twenty years of data for the US, France, and Canada.

In their seminal paper on the changes of the skill premium in the U.S., Katz and Murphy (1992) state: "It appears that an explanation emphasizing fluctuations in supply growth has the potential to explain observed fluctuations in the college wage premium". This paper offers a theory of the supply attributing changes in supply to changes in the outside option of workers represented by changes in returns to entrepreneurship and quantifies this effect on the skill premium.

The paper is organized as follows. Next section presents the data and the main empirical results. Section 3 develops the model, defines and characterizes its stationary equilibrium. Section 4 provides a back of the envelope calculation. Section 5 parametrizes the model and presents a numerical exercise. Section 6 concludes.

2 Stylized Facts

This section highlights the main empirical results of the paper that provide a motivation for the theory presented. In particular, countries where wage inequality is high are countries where barriers to entrepreneurship are low.

2.1 Wage Inequality and the Skill Premium

Developed countries show different patterns of wage inequality. Wage inequality is high in the United States and in the United Kingdom but low in most countries of Continental Europe. In the last twenty years, wage inequality increased remarkably in the United States and the United Kingdom. Conversely, there has been little or no change in the wage structure of most of the countries of continental Europe.

Table (1) reports data on the percentage differential between the ninth and the first earning deciles for male workers for the United States, United Kingdom and an average of Continental European countries. Earnings inequality in 1975 was higher in the United States than in Europe. In the following twenty-five years it increased by 29 percent in the US but only by 4 percent in Europe.

Over the same period, returns to education increased in the United States. According to Eckstein and Nagypal (2004), the college wage premium, i.e. the ratio between the average weekly wage of

college graduates and that of workers with at most a high school diploma, increased by 25 percent between 1975 and 2000. Bils and Klenow (2000) calculate for a large set of countries the Mincerian coefficient, i.e., the coefficient on the number of years of education in a log-wage regression. Table (1) reports the resulting college premium implied by their estimates for year 1989. The college premium is 1.63 in the U.S. 1.41, in the U.K, but much lower for other European countries, for example, 1.28 in Germany and only 1.12 in Italy. This measure of wage inequality is highly correlated with the 90-10 log wage differential, the correlation coefficient being 0.94.

2.2 The Business Environment and Entrepreneurship

The quality of the business environment can be assessed by means of different measures. Table (2) reports some of them collected in a recent publication by the World Bank (2005). The Doing Business database collects different measures of bureaucratic and legal hurdles an entrepreneur must overcome to incorporate and register a new firm. The table shows the number of procedures required to register a new firm, and the average time spent during each procedure. Moreover, it reports the official cost of each procedure, and the minimum capital required as a percentage of income per capita for a new commercial or industrial firm with up to 50 employees and start-up capital of 10 times the economy's per-capita gross national income (GNI).

Europe appears on average to be a much tougher environment for people to exploit the possibility of being entrepreneurs. The average number of days required in Europe for a firm to have legal recognition is five times the one required in the United States. The official cost of completing all the procedures is on average almost 200 times bigger in Europe than in the United States.

A broad measure of barriers to entrepreneurship is found in Conway and Nicoletti (2006). The index, called *REGREF*, includes information on legal and administrative barriers to entrepreneurship, public ownership, the market share of the dominant players and price controls, and it has been constructed ' from the perspective of regulations that create barriers to entrepreneurship and restrict competition in domestic markets where technology and demand conditions make competition viable'. *REGREF* ranges from 0 to 6, being 0 in the most unregulated country and 6 in the most regulated one. Data on *REGREF* are reported in Table (3). Despite the fact that most of the countries implemented deregulation policies, the United States appears to be the most liberalized country throughout the considered period.

The business environment has been found to be determinant for explaining different level of entrepreneurial activity across countries. According to Klapper et al. (2004) entry regulations hamper entry. Similar results have been found by Desai et al. (2003) and Klapper et al. (2009). Greater fairness and greater protection of property rights increase the entry rates, reduce the exit rates, and also lower the average firm size.

In an attempt of assessing the role of regulatory and legal environment in determining the individual decision to engage in new entrepreneurial activity, Ardagna and Lusardi (2008) exploit a data set compiled by the Global Entrepreneurship Monitor (GEM). Ardagna and Lusardi find that regulation acts as a detriment to entrepreneurship, particularly for those individuals who become entrepreneurs to pursue a business opportunity. Table (5) shows the number of individuals who are starting a business as a percentage of the total adult population. The United States appears to be the frontier, while european countries display lower rates of entrepreneurship.

Similar patters emerge by looking at the demography of firms documented by the OECD (2007) and Giovannini (2008). Table (4) reports these data. Employer enterprise births includes enterprise births that have at least one employee in the birth year and of enterprises that existed before the year in consideration, but were below the threshold of one employee. Enterprise births cover all enterprises, regardless of whether they are employers or not. Births rate is just the number of births as a percentage of the population of active enterprises. The Churn rate is equal to the birth rate plus the death rate.

2.3 Entrepreneurship and Education

The GEM data set provides information about the individual characteristics of people starting a business. Interestingly, according to Ardagana and Lusardi, entrepreneurs have on average a level of education higher than the rest of the population. De Nardi et al. (2007) provide similar evidence. Using data from the Survey of Consumer Finance and defining entrepreneurs as self-employed business owners, De Nardi et al. find that the fraction of entrepreneurs with a college degree is 15-20 percent higher than the fraction for the rest of the population while the fraction of entrepreneurs with a high school degree or less is 15-20 percent lower than the rest of the population. Djankov et al. (2008) performed a test of cognitive ability based on short term recall and found that entrepreneurs did significantly better than non entrepreneurs.

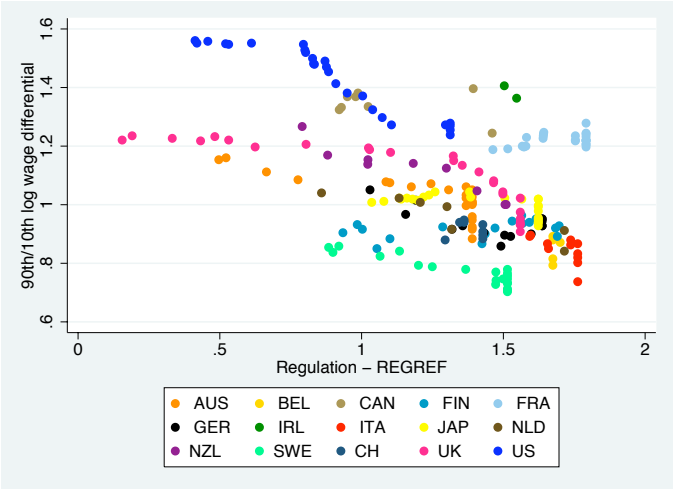
2.4 Correlations

This section exploits the data described in the previous subsection and, in a panel data analysis, explores the correlations that motivate this study.

2.4.1 Wage Inequality and *REGREF*

Figure 1 plots the level of wage inequality against *REGREF*, where all variables are in log. The panel shows a strong negative correlation suggesting that barriers to entrepreneurship are lower in more unequal countries. To take a closer look at this correlation I regress the logarithm of the

Figure 1: Wage Inequality and REGREF



wage differential on the logarithm of the index *REGREF*. The most general specification for which I report results here is the following,

$$\log w_{\frac{90}{10}it} = \beta \log REGREF_{it} + \sum_j \gamma_j X_{jit} + \psi_i + \delta_t + \theta_i t + \varepsilon_{it} \tag{1}$$

where ψ_i and δ_t represent country and time dummies, ε_{it} is a white noise and $\{X_{jit}\}$ is a set of variables that control for those country specific characteristics that have been found to be important determinants of the observed different degree of wage inequality.

The labor market in the United States is largely non unionized and wage-setting very decentralized. On the other hand, European countries have higher rates of unionization and the wage-setting is much more centralized than in the United States (Blau and Kahn (1996)). A higher degree of compression of the wage distribution should then characterize European countries, since unions would push up the minimum wage and lower the weight of individual characteristics in the determination of the wage. Moreover, to the extent that skilled and unskilled workers are imperfectly substitutable and market forces are at work, countries with a relative scarce supply of skilled workers would display, for a given demand, a higher degree of inequality (Katz and Murphy (1992), Leuven et al. (2004)).

Given these considerations, I control for the degree of unionization of the labor force, the relative supply of skills measured by the relative share of the population with a college degree and a measure of employment protection. Moreover, as a measure of market cyclical conditions I include a linear trend and the unemployment rate.

The sample is restricted according to data availability. I consider a unbalanced panel of 17 OECD countries[3] for a the period 1975-2000.

Table (6) presents the results of the OLS regressions. I find a significant negative effect of regulation on wage inequality: the coefficient for the summary measures of regulation is always significant at the 1 percent level across models. Moreover, the coefficients associated with the control variables have all the expected sign and are significantly different from zero, except from the one associated with the unemployment rate. These results are robust to the inclusion of country-specific time trends[4].

The coefficient β measures the elasticity of wage inequality with respect to the index *REGREF*. To get a sense of the magnitude of the estimates obtained consider, as a counterfactual, the case in which Europe in year 2000 had the same degree of regulation of the products market as the United States. The estimated coefficient would imply that in this case, other things equal, Europe would display a degree of wage inequality 11 percent higher than the actual one. In other terms, this regression is suggestive of the fact that 36 percent of the difference between wage inequality in the US and Europe could be attributed to differences in the regulatory environment.

2.5 Returns to Entreprenurship and the Skill Premium

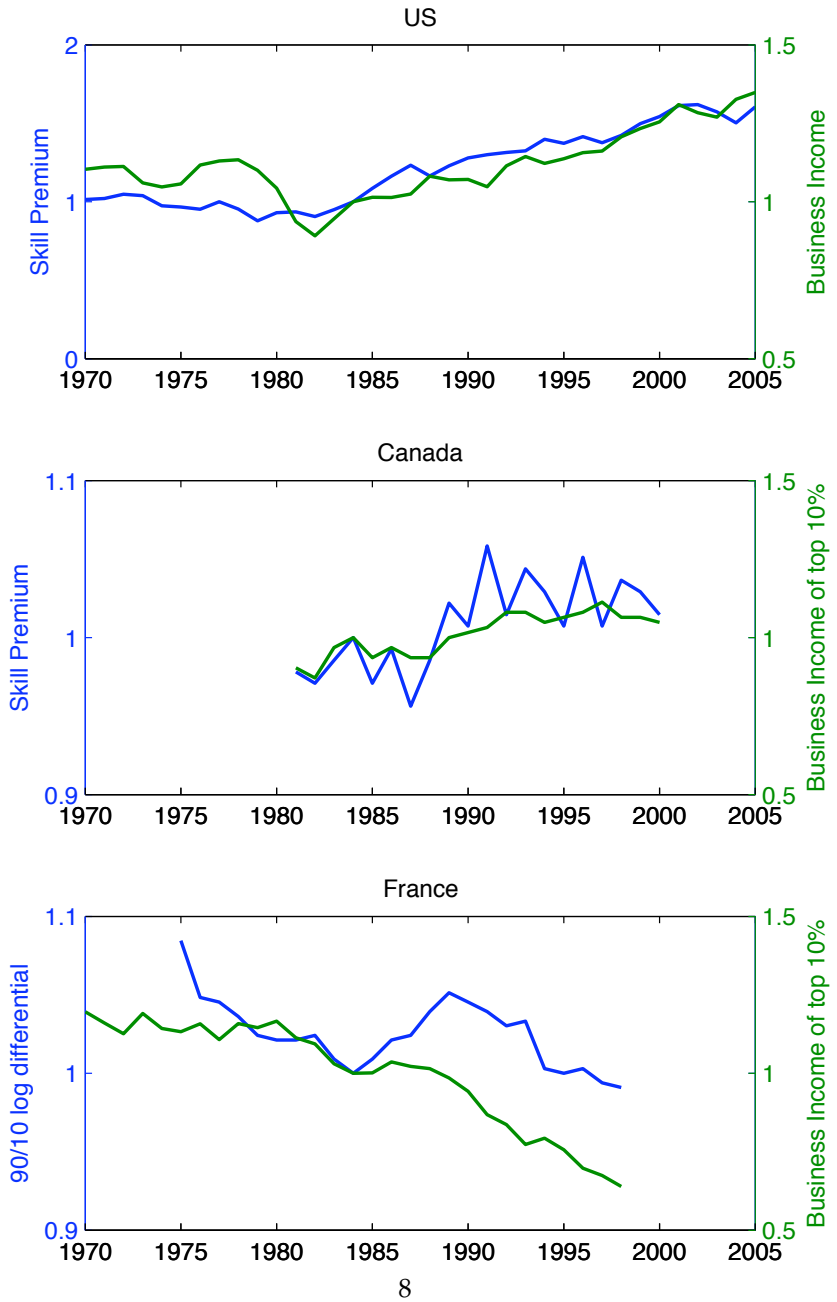
Using data from the Survey of Consumer Finances, De Nardi et al. (2007) find that business income in the U.S. increased considerably over the last twenty years. In particular, they find that business income cash flow, computed as wage and salary income and other distributions drawn from the business by the entrepreneur and his or her spouse, increased in real terms by 68% between 1989 and 2004. Moreover, by taking into account unrealized capital gains, they find that business income almost double over the same period of time.

The flow of funds accounts of the U.S. reveal a similar pattern. Nonfarm noncorporate business proprietors' income increased of almost 28% between 1975 and 2005. Figure (2) reports the time series for business income, together with the one for the skill premium for the US together with the two series for Canada and France. Despite displaying diverse paths for business income, this high correlation holds in twenty years of data for three countries. In the U.S, where a sharp increase in the two measures starting from the beginning of the 80s followed a decline. In Canada, where both measures mildly increased in the last twenty years. In France, where both business income and wage inequality went down over time.

[3]Countries included are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom, United States

[4]The results of this set of regressions are not reported here but are available upon request.

Figure 2: Wage Inequality and Business Income. Data for business income of top 10% for the three countries are from Atkinson and Piketty (2007). The skill premium in the US and Canada are respectively from Autor, Katz, and Kearney (2008) and Bubidge, J.B., L. Magee and A.L. Robb (2002). Data for wage inquality in France are from OECD (2008)



3 The Model

This section presents a general theory of wage inequality that accounts for the facts described in the previous section. The theory relies on the ability of individuals to leverage their knowledge, and explores how barriers to mobility of talents across occupations affect equilibrium allocations and relative prices. The physical environment is described. The equilibrium is defined and, given some parameters restrictions, characterized. Some comparative static results are derived.

3.1 Preferences and Technology

Time is continuous and horizon infinite. The economy is populated by a continuum with mass N of risk-neutral agents who discount time at rate r. Agents are heterogeneous as they are born with different talents. Talent is distributed in the economy according to the function $H(z)$, with density $h(z)$ and support $\zeta \subseteq \mathbb{R}_+$. Talent is broadly defined as the ability of agents of dealing with given problems or tasks by following existing procedures, as well as the ability of elaborate on them in order to reduce their level of complexity or more generally the ability to create new problems whose solution requires new algorithms. Talent is then the ability to work on existing ideas as well as the ability to innovate and create new ones. More talented agents solve more complex problems and, more generally, are able to accomplish tasks of any given complexity in a shorter amount of time. Moreover, more talented agents have the ability to come up with better ideas. In particular, depending on their talent z, agents have access to ideas whose quality is distributed according to the function $G(\cdot|z)$. Given any two distribution functions $G(\cdot|z)$ and $G(\cdot|z')$, if $z > z'$, the former stochastically dominates the latter, i.e. if $z > z'$, $G(x|z) < G(x|z')$ for any x.

There is a single homogenous good, whose production takes place in firms. Firms are the place where ideas are implemented and procedures followed. Each firm consists of an entrepreneur together with labor and physical capital, and is characterized by a specific set of procedures whose productivity is drawn by the entrepreneur when the firm is started. Firms are owned and run by entrepreneurs.

Agents choose how to use their talent as they can realize it in different and, I assume for now, mutually exclusive activities. They can either work for existing firms or open up their own firm. In the first case, they simply follow certain procedures, while in the second they set up new procedures and organize their implementation. I will refer to agents who engage in the first activity simply as 'workers' and to agents who engage in the second activity as 'entrepreneurs'. Workers with talent z earn a wage $w(z)$, while entrepreneurs of firms with productivity x enjoy the net profit of their firm, $\pi(x)$.

Agents become entrepreneurs once they get an idea. I assume that agents who look for ideas do not

work for any firm[5], and while voluntarily unemployed, they draw ideas at Poisson rate λ. Upon the realization of an idea, the agents decide to open up a firm or not. In case they decide to become entrepreneurs, they pay a fixed cost κ, denominated in terms of output. I interpret κ as a measure of the hurdle of doing business. Then, κ not only represents the mere start-up cost but it also accounts for those implicit costs imposed by regulations and aspects of the business environment, such as financial development, labor regulation, and protection of intellectual property, that might restrict the set of opportunities and hamper entrepreneurship. Once firms are open, entrepreneurs hire labor and capital on their respective markets and production starts. Notice that every firm is characterized by the productivity level of the idea drawn by the entrepreneur. This productivity level is kept constant over the life of the firm.

To keep the model at the simplest level, I assume that agents die at an exogenous rate σ. Moreover, I assume that if the entrepreneur dies, his firm disappears with him [6]. To keep steady state, I assume agents are born at rate σ.

Figure 2 gives account of the flow across states. I is the state in which agents look for ideas, W is the state in which agents are workers in existing firms, E the one where agents are entrepreneurs.

Notice that, similarly to Hopenhayn (1992a), agents pay an entry cost before knowing the realization of productivity of the firm that is thus sunk. This cost is represented by the forgone wage, while the annutized κ can be interpreted as a fixed cost faced by the firm.

The production function of a firm with productivity x is

$$y(x) = F(l, k, x),$$

where k represents the physical capital and l is total effective labor which is compounded of the labor services provided by agents with different talent. The function $F(l, k, x)$ is strictly increasing in its arguments and linearly homogenous of degree one.

Markets for labor services and physical capital are competitive. Their respective prices are given by w_z for any z, and r. The problem of the firm with productivity x can be summarized as follows,

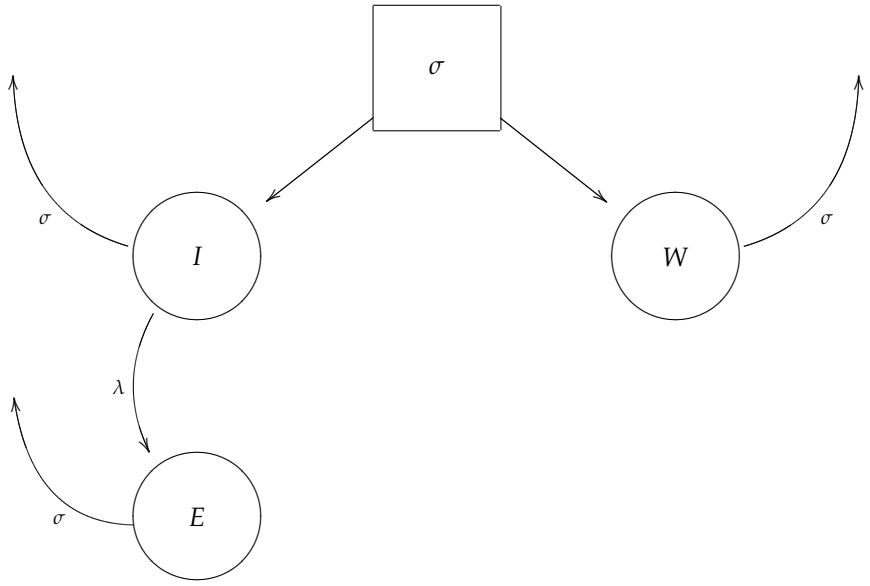
$$\max_{l_z, k} F(l, k, x) - \int w_z l_z dz - rk,$$

where l_z is the amount of labor services provided by agents with talent z. Let $\pi(x)$ be the variable profit i.e., what is left over of production of firm with productivity x after paying for labor, $\pi(x) \equiv$

[5] While this assumption is important to simplify the analysis, the main results of the model would go through by allowing agents to look for ideas on the job as long as developing ideas is assumed to be an easier activity if performed off the job.

[6] A more general framework would allow for different probabilities of death for firms. One way this would be implemented is allowing the hazard rate to be a function of the quality of the idea. This would be consistent with the evidence on firm dynamics as in, for instance, Rossi-Hansberg and Wright (2007)

Figure 3: Flow Across States



$y(x) - \int w_z l_z dz - rk$. Assuming decreasing returns to scale at the firm level, $\pi(x) > 0$. Then, the profit $\pi(x)$ represents payments to the fixed factor x, and might be understood as payments to organizational capital, in the language of Atkeson and Kehoe (2008).

3.2 The Value Functions

Given their talent, agents solve the occupational choice problem by comparing the value of being a worker with the one of looking for an idea and eventually becoming entrepreneur. Let $V_i(z)$ be the value of an agent with talent z who looks for ideas and $V_w(z)$ the value of the same agent who works for an existing firm. Obviously, agents choose to be workers if $V_w(z) \geq V_i(z)$. Vice-versa, they choose to look for ideas and eventually become entrepreneur if $V_i(z) \geq V_w(z)$ and they are indifferent between the two occupations if $V_i(z) = V_w(z)$.

Let $V_e(x)$ be the value of an entrepreneur of a firm with productivity x. The problem of an agent with talent z who looks for an idea is then described by the following Bellman equation,

$$rV_i(z) = \lambda \int \max\{V_e(x) - \kappa - V_i(z), 0\} dG(x|z) - \sigma V_i(z), \tag{2}$$

where the first term on the right hand side represents the expected value of becoming an entrepreneur. It follows that there is a reservation productivity schedule $R(z)$ determined in equilib-

rium such that

$$\begin{array}{lll} V_e(R(z)) - \kappa & \geq V_i(z) & \\ \text{with} & = & \text{if } R(z) > x_{min}, \end{array} \tag{3}$$

so that for a given talent z and any realization $x \geq R(z)$ a new firm is started while no firm with $x < R(z)$ exists. Equation (2) can then be re-written as

$$rV_i(z) = \lambda \int_{R(z)} (V_e(x) - \kappa - V_i(z)) dG(x|z) - \sigma V_i(z). \tag{4}$$

Notice that, because of (3), the first term of the equation represents the difference between the value of the average entrepreneur with talent z and the value of an entrepreneur of the firm with productivity at the reservation level $R(z)$.

The entrepreneur is the residual claimant of the firm. He enjoys the dividend of the firm. The value of the entrepreneur of a firm with productivity x is

$$rV_e(x) = \pi(x) - \sigma V_e(x). \tag{5}$$

A worker with talent z earns the same wage $w(z)$ in any firm. His value is simply,

$$rV_w(z) = w_z - \sigma V_w(z). \tag{6}$$

3.3 Equilibrium

In this section a stationary equilibrium is defined, and given some simplifying assumptions, characterized.

Let $i(z)$ be the mass of agents with talent z who are looking for an idea, and $e(z)$ the mass of agents with talent z who are entrepreneurs, so that $i \equiv \int i(z)dH(z)$ is the mass of agents looking for ideas, and $e \equiv \int e(z)dH(z)$ the mass of agents who are entrepreneurs. The mass of entrepreneurs with talent z evolves over time according to the first order ordinary differential equation (ODE),

$$\dot{e}(z) = \lambda[1 - G(R(z)|z)]i(z) - \sigma e(z), \tag{7}$$

where the first term on the right hand side represents the inflow of agents with talent z who got an idea with productivity greater than the conditional reservation value $R(z)$, and the second term represent the outflow of entrepreneurs with talent z who are dying. Let L_z be the fraction of agents with talent z who are workers in existing production processes, and $L \equiv \int L_z dH(z)$ the total mass of workers.

Let $\mu(x)$ denote the mass of firms with productivity smaller or equal to x and $\mu \equiv \int d\mu(x)$ the total mass of firms. Notice that, since every firm is owned and managed by one entrepreneur, $e = \mu$. The mass of firms with productivity smaller or equal to x satisfies the following first order ODE,

$$\dot{\mu}(x) = \lambda \int [G(x|z) - G(R(z)|z)]i(z)dH(z) - \sigma\mu(x), \tag{8}$$

where the first term represents the inflow of agents who got an idea with productivity smaller than x but above their reservation productivity $R(z)$, $\forall z$, while the second represents the flow of firms that are destroyed with intensity σ.

Definition 1 *A stationary competitive equilibrium is a reservation productivity schedule $R(z)$, a set of prices w_z, r, and values $V_e(x)$, $V_i(z)$ and $V_w(z)$, together with measures $\mu(x)$ of firms, $i(z)$ of agents looking for ideas, $e(z)$ of entrepreneurs and L_z of workers and allocations $k(x), l_z(x)$, such that for any $z \in \zeta$,*

1. *$R(z)$ satisfies the entry conditions (3), and*
2. *the functional equations (2), (5), (6),*
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 $\int k(x) d\mu(x) = K$, are satisfied.*

3.4 Characterization

The characterization of the equilibrium depends crucially on the functional forms governing production, $F(l, k, x)$, and the distributions of talents and ideas, $H(z)$ and $G(\cdot|z)$, as they shape the payoffs structure and thus agents' incentives and choices. I assume the production function has the following general form,

$$F(l, k, x) = \left[\int \omega_z m_z^\rho dz \right]^{\frac{1-\alpha}{\rho}} k^\alpha, \tag{9}$$

where

$$m_z = [\psi_z x^{\gamma_z} + (1 - \psi_z)(A_z l_z)^{\gamma_z}]^{\frac{1}{\gamma_z}}. \tag{10}$$

Notice that the elasticity of substitution between firm's specific productivity x and effective labor of each type z is allowed to vary together with z, $\epsilon_{x,l_z} = 1/(1 - \gamma_z)$, while elasticity of substitution between different types of labor is assumed to be constant, $\epsilon_{l_{z_i}, l_{z_j}} = 1/(1 - \rho)$ $\forall (i, j)$. The parameter A_z represents the productivity of workers with talent z. This, together with the parameters ψ_z and ω_z contribute defining how income is divided among different factors. I assume $\int \omega_z dz = 1$.

The problem of a firm with productivity x is as in Atkeson-Kehoe (2007). Define the size of firm with productivity x

$$n(x) = \frac{x}{\bar{x}},$$

where $\bar{x} = \int x d\mu(x)$ is the aggregate productivity. Since the production function F is linear-homogenous of degree one and there is only one fixed factor, all types of labor and capital are used in the same proportions in all firms. In equilibrium,

$$l_z(x) = n(x)L_z, \ \forall z, \ \ k(x) = n(x)K, \ \ y(x) = n(x)Y,$$

where L_z and K are the aggregate supply of labor of type z and physical capital stock and $Y = F(L, K, \bar{x})$ is the aggregate output. It follows that firms profits are linear in productivity, $\pi(x) = (1-\chi)y(x)$.[7]

In what follows, in order to characterize the equilibrium and derive analytical results, I make the following simplifying assumptions.

I assume the distribution of talents $H(z)$ is degenerate. In particular, I assume that mass L_u of agents are born with talent A_u, and mass 1 are born with talent A_s, with $A_u < A_s$, i.e. given $\zeta = \{A_u, A_s\}$ with $A_u < A_s$, $h(A_u) = L_u/N$ and $h(A_s) = 1/N$, where $N \equiv L_u + 1$. I will refer to agents with talent A_u as 'unskilled' agents and to agents with talent A_s as 'skilled'. I assume that the distribution of ideas accessible to unskilled agents is degenerate, as $G(x_{min}|A_u) = 1$, with $x_{min} < A_u$. It follows that unskilled agents will never choose to become entrepreneurs[8], i.e. $e(A_u) = 0$, $i(A_u) = 0$, and will thus inelastically provide their talent in the labor market, $n_w(A_u) = L_u$. Let $L_s \equiv n_w(A_s)$. The resource constraints now read $e + i + L_s = 1$, $\int l_s(x)d\mu(x) = L_s$, $\int l_u(x)d\mu(x) = L_u$. Since every agent with talent A_s has access to the same distribution of ideas, $G(\cdot|A_s)$, I will simply refer to this distribution as in $G(\cdot)$. The ODE (8) simplifies to $\dot{\mu}(x) = \lambda[G(x) - G(R)]i - \sigma\mu(x)$.

Given the following assumption on the right tale of the probability distribution function $g(\cdot)$,

Assumption 1 *Let* $\tilde{x} \equiv \frac{\int_y x dG(x)}{1-G(y)}$, $\frac{\partial \log \tilde{x}}{\partial \log y} \leq 1, \forall y \in \zeta$.

the following proposition can be stated.

Proposition 1 *If* $\zeta = [0, \infty)$*, an equilibrium exists. Moreover, if Assumption 1 is fulfilled, the equilibrium is unique.*

Proving the existence of the equilibrium amounts to finding the solution to a fixed point problem. In what follows I characterize the equilibrium in terms of the reservation productivity R. In particular, I derive a set of equilibrium objects as a function of R, that provide a system of equations whose solution solves uniquely for R. The complete proof is in the appendix.

[7] It is straightforward to show that $\pi(x) = y(x) - \int w_z l_z(x)dz - rk(x)$ can be expressed as $\pi(x) = (1-\chi)y(x)$, where $\chi \equiv \alpha + \frac{\int w_z L_z dz}{Y}$, is the share of income paid to physical capital and labor. In the appendix an expression for χ is derived.

[8] To be proved.

First, notice that the steady state condition, $\lambda[G(x) - G(R)]i = \sigma\mu(x)$, together with the resource constraint $e + i + L_s = 1$, and $e = \mu$, pins down the mass of firms as a function of the reservation productivity R and the supply of skilled workers. The mass of firms,

$$\mu = \frac{\lambda[1 - G(R)]}{\lambda[1 - G(R)] + \sigma}(1 - L_s) \tag{11}$$

is an increasing function of the rate at which skilled workers become entrepreneurs, while it is decreasing in the rate at which people die. Vice-versa, the fraction of skilled workers looking for ideas,

$$i = \frac{\sigma}{\lambda[1 - G(R)] + \sigma}(1 - L_s) \tag{12}$$

is increasing in the death rate and and increasing in the rate $\lambda[1 - G(R)]$. Notice that both (11) and (12) are obviously decreasing functions of the supply of skilled workers. However, L_s is determined in equilibrium as it will become clear in the next section.

From steady state condition $\dot{\mu}(x) = 0$ it follows that the cumulative distribution function of firms can be expressed as a linear function of the conditional distribution of ideas,

$$\frac{\mu(x)}{\mu} = \frac{G(x) - G(R)}{1 - G(R)}. \tag{13}$$

The aggregate productivity level $\bar{x} = \int x d\mu(x)$, can then be expressed as the product between the average productivity and the mass of firms,

$$\bar{x} = \frac{\mu}{1 - G(R)} \int_R x dG(x).$$

3.5 The prices for talent

This subsection derives the equilibrium prices for talent. Since the distribution of talents is assumed to be degenerate, a measure of inequality is provided by the skill premium, defined as the ratio between the wage earned by skilled workers and the wage earned by the unskilled workers. It is useful to derive an expression for the skill premium by looking at the equilibrium in the market for relative skills.

3.5.1 The demand for relative skills

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

$$\frac{w_s}{w_u} = \frac{F_{l_s}(l_s, l_u, k, x)}{F_{l_u}(l_s, l_u, k, x)}. \tag{14}$$

The relative demand of skills is then a function of the elasticity of substitution between the two factors.

3.5.2 The supply for relative skills

The supply of unskilled workers is taken as inelastic. The relative supply of skills is then determined by the supply of skilled workers, which in turn is determined by the wage prevailing in equilibrium. From (11), the supply of skilled workers can be expressed as a function of the mass of firms

$$L_s = 1 - \frac{\lambda[1 - G(R)] + \sigma}{\lambda[1 - G(R)]}\mu. \tag{15}$$

In order to express the supply as a function of the wage, notice, first of all, that the wage of skilled workers is then pinned down by the indifference condition,

$$V_w = V_i. \tag{16}$$

The wage of skilled workers adjusts so that skilled agents are indifferent between the two occupations. The entry condition together with (16) implies that

$$w_s = \pi(R) - (r + \sigma)\kappa.$$

The net dividend for the owner of the firm whose productivity is at the reservation level net of the annuitized fixed cost compensates the owner for the forgone wage.

By using (4) and (6), the wage of skilled workers can be written as the expected value of an entrepreneur,

$$w_s = \lambda \int_R (V_e(x) - \kappa - V_i) dG(x).$$

Recalling the entry condition (3), and using (5) together with (13), w_s can be expressed as a function of the reservation productivity R,

$$w_s = \frac{\lambda[1 - G(R)]}{r + \sigma}[\pi(\tilde{x}) - \pi(R)], \tag{17}$$

where $\pi(\tilde{x})$ is the profit of the average firm and $\pi(R)$ is the profit of a firm with productivity at the reservation level. Notice that, since profits are a linear function of the productivity of the firm, the profit of the average firm is the average profit in the economy.

Because the profit of any firm is a share $(1 - \chi)$ of the firm's output, $\pi(x) = (1 - \chi)y(x)$, and because every firm's output is a linear function of the total output, $y(x) = n(x)Y$, where $n(x) = x/\bar{x}$, (17) can be rearranged as

$$w_s = (1 - \chi)\frac{\lambda[1 - G(R)]}{r + \sigma}\frac{\tilde{x} - R}{\tilde{x}}\frac{Y}{\mu}. \tag{18}$$

The wage of skilled workers is thus a log-linear function of the share of income that goes to the entrepreneur, $(1 - \chi)$, the effective rate at which agents looking for ideas become entrepreneurs,

$\frac{\lambda[1-G(R)]}{r+\sigma}$, the average product of firms, $\frac{Y}{\mu}$ and the term $\frac{\tilde{x}-R}{\tilde{x}}$. Combining this expression together with (15), it is possible to express the supply of skilled workers as

$$L_s = 1 - \eta\chi\frac{Y}{w_s}, \tag{19}$$

where

$$\eta \equiv \frac{1-\chi}{\chi}\frac{\sigma+\lambda[1-G(R)]}{\sigma+r}\frac{\tilde{x}-R}{\tilde{x}},$$

is interpreted as a measure of the entrepreneurial channel.

Dividing both sides of (19) by L_u and taking into account that factors are paid their marginal product, it is possible to derive an expression that implicitly define the relative supply of skills as a function of the relative wage[9],

$$\frac{L_s}{L_u} = \frac{\frac{1}{L_u} - \frac{\eta\chi}{(1-\alpha)(1-\psi_u)}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u}\frac{w_u}{w_s}}{1+\frac{\eta\chi}{(1-\alpha)(1-\psi_s)}\left(\frac{M_s}{A_s L_s}\right)^{\gamma_s}}. \tag{20}$$

This expression provides some insights about the mechanism at work. Notice that the elasticity of the relative labor supply to the relative price crucially depends on the share of income paid to entrepreneurs, $(1-\chi)$. As this goes to zero, the supply of skilled agents becomes inelastic, as L_s approaches 1. However, income shares are determined in equilibrium.

In the special case where firm's specific productivity x complements different types of labor symmetrically, i.e. $\psi_z = \psi$, $\forall z$, and the elasticity of substitution between any type of labor and x is equal to one, i.e. $\gamma_z = 0$, $\forall z$, the share of income paid to the entrepreneur is constant across firms. In this case it is possible to retrieve the elasticity of the relative supply of skills with respect to the relative price as a function of η.

If $\gamma_z = 0$ and $\psi_s = \psi_u = \psi$, (9) can be written simply as,

$$F(l,k,x) = x^{1-\chi}\left[l^{1-\nu}k^{\nu}\right]^{\chi}, \tag{21}$$

where $l \equiv \left[\omega_s(A_s l_s)^{\xi} + \omega_u(A_u l_u)^{\xi}\right]^{\frac{1}{\xi}}$ with $\xi \equiv \rho(1-\psi)$ does not depend on x, $\nu \equiv \frac{\alpha}{1-(1-\alpha)\psi}$. The parameter $\chi = 1-(1-\alpha)\psi$ determines the degree of diminishing returns at the firm level, and in the spirit of Lucas (1978), can now be interpreted as the span-of-control. The labor input enters now as a constant elasticity of substitution aggregate of unskilled and skilled labor with elasticity of substitution between the two types of labor is $\epsilon_{s,u} \equiv 1/(1-\xi)$. The fact that the elasticity of substitution between capital and labor is assumed to be one ensures that the capital and labor share are now constant, and respectively equal to α and $(1-\psi)(1-\alpha)$ as well as the share of

[9] The derivation is in the appendix.

income paid to entrepreneurs, $1-\chi=(1-\alpha)\psi$ In this case, the relative supply of skilled workers (20) simplifies as,

$$\frac{L_s}{L_u}=\frac{(1-\nu)\frac{1}{L_u}-\eta\frac{w_u}{w_s}}{1-\nu+\eta}. \tag{22}$$

is a weighted average of the relative supply in case just one every skilled agent is employed as a skilled worker, $\frac{1}{L_u}$, and the relative wage, where the weights are given by the labor share of income $(1-\nu)$ and the entrepreneurial wedge η. Notice that the elasticity of the relative supply of skilled with respect to the relative wage is given by:

$$\frac{\partial \log \frac{L_s}{L_u}}{\partial \log \frac{w_s}{w_u}}=\frac{\eta}{\frac{1-\nu}{L_u}\frac{w_s}{w_u}-\eta} \tag{23}$$

which is an increasing function of the entrepreneurial wedge η.

3.5.3 D=S

Figure (4) represents the equilibrium in the market for relative skills graphically. The relative demand for skills is obviously downward sloping. Its curvature depends on the elasticity of substitution between the two factors,

$$\frac{w_s}{w_u}=\frac{\omega_s}{\omega_u}\left(\frac{A_s}{A_u}\right)^{\xi}\left(\frac{L_s}{L_u}\right)^{\xi-1} \tag{24}$$

Rearranging (22), it is possible to get an expression for the relative supply of skilled labor,

$$\frac{w_s}{w_u}=\left[\frac{1-\nu}{\eta}\frac{1}{L_u}-\frac{1-\nu+\eta}{\eta}\frac{L_s}{L_u}\right]^{-1}.$$

The relative supply of skills is an increasing function of the relative price. Its vertical intercept, $\frac{\eta}{1-\nu}L_u$, and slope are functions of the parameter η.

In equilibrium, the relative supply of skilled workers satisfies the following,

$$\phi_0\frac{L_s}{L_u}+\phi_1\left(\frac{L_s}{L_u}\right)^{1-\xi}-\phi_2=0. \tag{25}$$

where $\phi_0\equiv 1-\nu+\eta$, $\phi_1\equiv\frac{\omega_u}{\omega_s}\left(\frac{A_u}{A_s}\right)^{\xi}\eta$ and $\phi_2=(1-\nu)\frac{1}{L_u}>0$. Notice that, since $\xi<1$ and the coefficients ψ_0,ψ_1 are increasing in η, L_s/L_u is uniquely determined by (25), and it is decreasing in the entrepreneurial wedge η.

It is possible to obtain a closed form solution for the relative supply of skilled workers and the skill premium as a function of the reservation productivity in the case where the elasticity of substitution between skilled and unskilled labor is equal to one, $\xi=0$. In this case,

$$\frac{L_s}{L_u}=\frac{\phi_2}{\phi_0+\phi_1}=\frac{1-\nu}{1-\nu+2\eta}\frac{1}{L_u}, \tag{26}$$

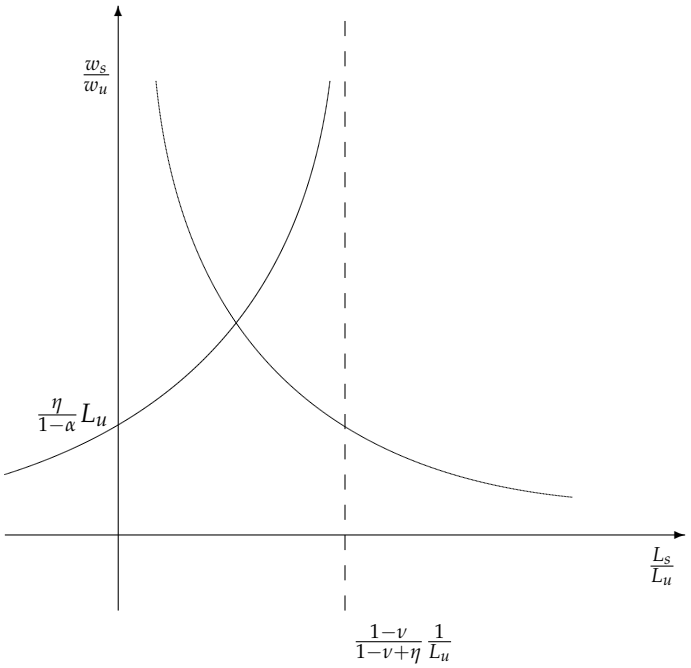


Figure 4: Equilibrium in the Market for Relative Skills for a given κ.

and obviously,

$$\frac{w_s}{w_u} = \frac{1-\nu+2\eta}{1-\nu} L_u,$$

from which it is immediate to see that, if the entrepreneurial channel is shut down, $\eta = 0$, the relative supply of skilled is inelastic, $\frac{L_s}{L_u} = \frac{1}{L_u}$ so that the relative wage reduces to $\frac{w_s}{w_u} = L_u$.

3.6 Comparative Statics

This section presents the main qualitative results of the paper for the case discussed in the previous subsection where the share of income paid to entrepreneurs is constant, $1-\chi = (1-\alpha)\psi$. High costs of entry reduce the number of firms, increase their size and decrease the skill premium. The numerical exercises presented in the next sections give a sense of the quantitative relevance of the mechanism discussed.

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, $\frac{\partial R}{\partial \kappa} > 0$.*

A high cost of entry reduces the incentive to open up a firm and induces an increase in the quality of the ideas actually implemented.

Lemma 3 *The supply 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 increases $\frac{\partial \mu}{\partial \kappa} < 0$.*

The first part of this lemma follows immediately from the previous two since, as noticed before, L_s is increasing in η. For $\xi < 1$ the second part is obvious, while the third follows from (11). Figure (5) describes the equilibrium in the market for relative skills for the case in which $\kappa' < \kappa$. For lower entry costs skilled agents find entrepreneurship more attractive and thus reduce their supply as skilled workers. Given that the production function exhibits constant elasticity of substitution between the two factors, the relative demand of skills is not affected. A lower relative supply thus results in an increase in equilibrium relative wage.

4 Back of the Envelope Calculation

In order to understand how much of the observed cross-country differences in wage inequality can be accounted by the entrepreneurial channel, I perform the following calculation. In the case

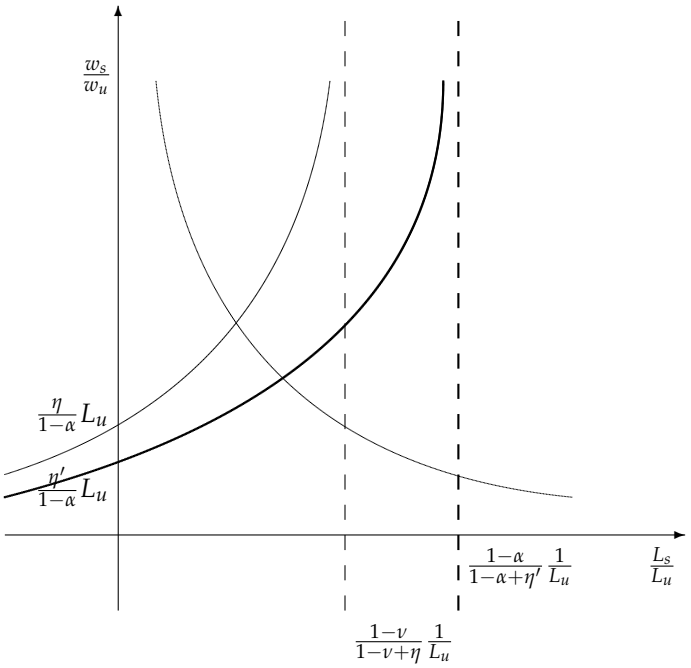


Figure 5: The Equilibrium in the Market for Relative Skills for $\kappa' > \kappa$

analyzed in the previous section, where firm's specific productivity x complements different types of labor symmetrically, i.e. $\psi_z = \psi$, $\forall z$, and the elasticity of substitution between any type of labor and x is equal to one, i.e. $\gamma_z = 0$, $\forall z$, the log linearized of the demand for skills is

$$\log \frac{w_s}{w_u} = \xi \log \frac{A_s}{A_u} - (1-\xi) \log \frac{L_s}{L_u}, \tag{27}$$

The skill premium differential between two economies, say Europe and the U.S., is thus

$$\log \frac{w_s^{US}}{w_u^{US}} - \log \frac{w_s^{EU}}{w_u^{EU}} = -(1-\xi) \left[\log \frac{L_s^{US}}{L_u^{US}} - \log \frac{L_s^{EU}}{L_u^{EU}} \right], \tag{28}$$

where I assumed that labor is equally productive in both economies, $\frac{A_s^{US}}{A_u^{US}} = \frac{A_s^{EU}}{A_u^{EU}}$.

It follows that, for a given elasticity of substitution between the two factors, $1/(1-\xi)$, differences in the skill premium between two locations have to be attributed to differences in the relative supply of skills. Recall the identity $L_s = 1 - e$, where $e = i + \mu$ is the fraction of the skilled agents engaged in business activities, for they are either looking for an idea or owning a firm. Given that the mass of unskilled workers, L_u, is taken as exogenously given and inelastic, the relative supply of skilled workers can be expressed as a function of the ratio of the population engaged in business activities, $\theta \equiv \frac{e}{1+L_u}$,

$$\frac{L_s}{L_u} = \frac{1}{L_u}(1-\theta) - \theta. \tag{29}$$

I use data on θ collected by the Global Entrepreneurship Monitor (GEM), and calculate the predicted skill premium implied by (28), for plausible values of the elasticity of substitution between skilled and unskilled labor [10]. Following Caselli and Coleman (2006), I adopt a really broad definition of skilled agents. In particular, I consider skilled the fraction of population that completed primary education. This allows me to go around the problem of having to conjecture what fraction of the population with different educational attainment enters entrepreneurship.

Table (B) gives account of the calculation. In the first column, it reports the actual skill premium as a ratio with the skill premium in the US. The predicted skill premium for different values of the elasticity of substitution between skilled and unskilled labor is reported in columns 3, 5 and 7. In the first case, corresponding to a Cobb-Douglas, I use $\frac{1}{1-\xi} = 1$. In the second, I use the value that Katz and Murphy (1992) retrieved by estimating equation (27) on U.S. time-series data between 1963 and 1997, with a time trend to control for changes in A_s/A_u, $\frac{1}{1-\xi} = 1.4$. In the last one, I use the value estimated by Krusell et al. (2000), $\frac{1}{1-\xi} = 1.67$. Columns 4, 6 and 8 report a statistic that measures how much of the difference between the skill premium in a given country and the skill premium in the U.S. can be explained by the entrepreneurial channel. These numbers are striking. Between 34 and 92 percent of the difference in skill premium between Europe and the U.S. can be attributed to the mechanism described in this paper. The more substitutable are skilled and

[10] Autor et al. (1998) find that the elasticity of substitution is very unlikely to fall outside of the interval between 1 and 2.

unskilled labor the less sensitive the skill premium is to changes in the relative supply and thus less sensitive to the entrepreneurial margin.

5 A Numerical Exercise

The purpose of this section is to explore numerically the properties of the model. The parametrization I provide in this section, rather than providing a definitive calibration strategy, aims at investigating the potential quantitative relevance of the theory. In what follows I consider the case where ideas complement the skill workers but not the unskilled, in the sense that, assuming the parameters $\gamma_s = \gamma_u = 0$, $\psi_s = 1$ while $\psi_u = 0$. Moreover, I consider an extension of the model of Section 3 where skilled workers work as unskilled while looking for ideas. This does not change the structure of the model and allows for a lower bound of the wage of the skilled.

5.1 Parametrization

To calibrate this model to the U.S., I set $\kappa = 0$ which is meant to reflect its relatively looser entry regulatory environment. I retrieve the relative share of skilled workers in the population from the Barro-Lee (2000) data set on educational attaiment. I normalize the time period to be a year and set the discount rate $r = 0.04$. This leaves 4 free parameters: $\alpha,\ \chi,\ \sigma,\ \lambda$, together with a cdf for ideas $G(\cdot)$.

In order to match the physical capital share I set $\alpha\chi = .19$ as in Atkeson-Kehoe (2005). Quite surprisingly, the percentage of people starting a business and the business ownership rate for the same year almost concide. Thus, the steady state condition of the model, $\lambda[1 - G(R)]u = \sigma\mu$, implies $\sigma = 1$. I assume that the distribution of ideas is Pareto, with curvature parameter ρ and a lower bound equal to one, $G(x) = 1 - x^{-\rho}$. I set the remaining parameters, χ, λ, ρ to match the observed labor share of income, skill premium, and percentage of population starting a business, to the corresponding objects in the model: (**??**), w_m/w_u, $\lambda(1 - G(R))u/(L + 1)$. This strategy delivers the following values, $\chi = 0.76,\ \lambda = 3,\ \rho = 8$. To get a sense on how reasonable these numbers are, some words are in order. First of all, the value for the parameter that determines the degree of diminishing returns at the firm level, $\chi = 0.76$, is lower than the one used by Atkeson-Kehoe (2005), 0.85, but above the one Hopenhayn and Rogerson (1993) use, 0.64, and it appears to be consistent with the discussion in Atkeson, Kahn and Ohanian (1996). Moreover, the value $\rho = 8$ is close to the one that Buera and Shin (2008) use to characterize the distribution of entrepreneurial talent, by matching employment and income concentration rate in the U.S.

Parametrization			
	US Data	Model	Parameters
Interest Rate	0.04	0.04	$r = 0.04$
Physical Capital Share	0.19	0.19	$\alpha\chi = 0.19$
Skill Premium	1.63	1.63	$\chi = 0.76$
Entry Rate	8.4	8.6	$\rho = 8$
Labor Share	0.66	0.67	$\lambda = 3$

5.2 A counterfactual

In this section I perform the following exercise. Given the parametrization obtained in the last section, I ask the model what would be skill premium and the labor share in the U.S. if the U.S. had the same entry rate of Italy. Doing so, I am implicitly backing up the cost of entry, κ. The results of this exercise are reported in Tabel 7.

A counterfactual			
	Entry Rate	Skill Premium	Labor Share
U.S. Data	8.4	1.63	0.66
Italy Data	5.5	1.12	0.60
U.S. as Italy	5.5	1.35	0.62

Under the Italian entry rate, the model predicts a skill premium of 1.35, which is twenty percent lower than the original one. The drop in the labor share is of six percent. However, the entry cost necessary to generate such a drop in the entry rate is quite high, corresponding to almost fifty percent of the profit of the average firm in the economy.

6 Conclusions

This paper proposes a theory of wage inequality among different skill groups that hinges on entrepreneurship. I first document that in countries where barriers to entrepreneurship are high, the skill premium is low. Moreover, I show that changes in the returns to entrepreneurship are highly correlated over time with changes in the skill premium. I then formalize the idea that barriers to entry lower the outside option for the skilled workers and thus their relative price in an occupational choice model. The model is parametrized on the entry rates of firms in the United States to match the observed skill premium assuming the cost of entry is zero. In a counterfactual exercise, the cost of entry in Italy is backed up by matching the entry rates in this country. Given such a

cost, the model is able to generate a drop in the U.S. skill premium of twenty percent, accounting for more than forty percent of the difference in the observed skill premium between the two countries. It has to be noticed that the current analysis is about the cross-section. It would be interesting to analyze the response of economies characterized by different institutional environments to a common technological shock in the spirit of Ljungqvist and Sargent (1998).

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Appendix

A Proofs and Derivations

A.1 Proof of Proposition 1

A.1.1 Existence

In order to show the existence of the equilibrium, the system of equations defined by (2), (5), (6) and the entry condition (3) is reduced to one equation in one unknown. In what follows, the function whose zero is a solution to such a system of equations is defined, and his behavior then assessed.

Recall the free entry condition,

$$V_e(R) - \kappa = V_i.$$

Multiplying left and right hand side of the free entry condition by the effective discount factor $(r + \sigma)$ and using (5) evaluated at the reservation value R it is possible to get the following expression

$$\pi(R) - (r + \sigma)\kappa = (r + \sigma)V_u. \tag{30}$$

Given the indifference condition $V_s = V_i$ and (6), (30) can be re-written as

$$\pi(R) - (r + \sigma)\kappa = (r + \sigma)V_i. \tag{31}$$

Now, using (6), (31) becomes

$$\pi(R) - \lambda \int_R (V_e(x) - \kappa - V_i) dG(x) - (r + \sigma)\kappa = 0 \tag{32}$$

Given this equation and (5) it is possible to define a function of R

$$\Psi(R) \equiv \pi(R) - \frac{\lambda}{r + \sigma} \int_R [\pi(x) - \pi(R)] \, dG(x) - (r + \sigma)\kappa, \tag{33}$$

whose zero is a solution for R.

Notice that if the lower bound of the distribution of ideas is zero then $\Psi(R)$ is negative

$$\lim_{R \to 0} \Psi(R) = -\frac{\lambda}{r + \sigma} \int_0 \pi(x) dG(x) - (r + \sigma)\kappa < 0,$$

while $\Psi(R)$ goes to infinity when R approaches infinity

$$\lim_{R \to \infty} \Psi(R) = \infty$$

Since the function $\Psi(R)$ is negative at the lower bound and positive at the upper bound, it has at least one zero.

A.1.2 Uniqueness

In order to show uniqueness it suffices to show that the function $H(R)$ is positively sloped in its domain.

$$\begin{aligned}
\frac{\partial \Psi(R)}{\partial R} &= \frac{\partial}{\partial R}\pi(R) - \frac{2\lambda}{r+\sigma}\frac{\partial}{\partial R}\int_R (\pi(x) - \pi(R))\, dG(x) \\
&= \frac{\partial}{\partial R}\pi(R) - \frac{2\lambda}{r+\sigma}\left[-\pi(R)\, g(R) - (1 - G(R))\frac{\partial \pi(R)}{\partial R} + g(R)\,\pi(R)\right] \\
&= \frac{\partial}{\partial R}\pi(R) - \frac{2\lambda}{r+\sigma}\left[-(1 - G(R))\frac{\partial \pi(R)}{\partial R}\right] \\
&= \left[1 + \frac{2\lambda(1 - G(R))}{r+\sigma}\right]\frac{\partial \pi(R)}{\partial R} > 0
\end{aligned}$$

since the term in parentheses is always positive and $\frac{\partial \pi(R)}{\partial R} > 0$ as shown below.

Under Assumption 1, in order to show that $\frac{\partial \pi(R)}{\partial R} > 0$, it suffices to show that the average output per firm, $\frac{Y}{\mu}$, is a increasing function of R. In fact, since $\pi(R) = (1-\chi)y(R)$ and $y(R) = n(R)Y$,

$$\pi(R) = (1-\chi)\frac{R}{\tilde{x}}\frac{Y}{\mu}. \tag{34}$$

A sufficient condition for this to be true is that

$$\frac{\partial \tilde{x}}{\partial R}\frac{R}{\tilde{x}} > \frac{\chi}{1-\chi}\frac{\partial \mu}{\partial R}\frac{R}{\mu}, \tag{35}$$

since

$$\frac{Y}{\mu} = \frac{\tilde{x}^{1-\chi}}{\mu^{\chi}}F(L_s, L_u, K) \tag{36}$$

and L_s is increasing in R as shown in Lemma 2. But (35) is always verified since the left hand side is always positive while the right hand side is always negative as implied by Lemma 2.

A.2 Proof of Lemma 2

This proof is immediate. Notice that the vertical intercept of the function $\Psi(R)$ defined in the previous section is a negative function of the parameter κ and that its slope does not depend on κ.

A.3 Profits are linear in x

Profits are defined as

$$\max_{l_z,k} F(l,k,x) - \int w_z l_z dz - rk.$$

Because of homogeneity of F,

$$\pi(x) = (1-\chi)\, y(x) \tag{37}$$

where $\chi = \alpha + \frac{\int w_z L_z dz}{Y}$.

Given the production function,

$$F(l,k,x) = \left[\int \omega_z m_z^\rho dz\right]^{\frac{1-\alpha}{\rho}} k^\alpha, \tag{38}$$

where $m_z \equiv [\psi_z x^{\gamma_z} + (1-\psi_z)(A_z l_z)^{\gamma_z}]^{\frac{1}{\gamma_z}}$, the first order condition of the firm implies for any z

$$w_z = (1-\alpha)(1-\psi_z)\frac{y}{l_z}\frac{\omega_z m_z^\rho}{\int_\zeta \omega_z m_z^\rho dz}\left(\frac{A_z l_z}{m_z}\right)^{\gamma_z}. \tag{39}$$

The labor share of income paid to agents with talent z is then

$$\frac{w_z L_z}{Y} = (1-\alpha)\frac{\omega_z M_z^\rho}{\int_\zeta \omega_z M_z^\rho dz}(1-\psi_z)\left(\frac{A_z L_z}{M_z}\right)^{\gamma_z}, \tag{40}$$

where now $M_z \equiv [\psi_z \bar{x}^{\gamma_z} + (1-\psi_z)(A_z L_z)^{\gamma_z}]^{\frac{1}{\gamma_z}}$. The total labor share of income is given by

$$\frac{\int_\zeta w_z L_z dz}{Y} = \frac{(1-\alpha)}{\int_\zeta \omega_z M_z^\rho dz}\int_\zeta \omega_z M_z^\rho (1-\psi_z)\left(\frac{A_z L_z}{M_z}\right)^{\gamma_z} dz, \tag{41}$$

A.4 The relative supply of skills

Recall (19),

$$\frac{L_s}{L_u} = \frac{1}{L_u} - \eta\chi\frac{Y}{w_u L_u}\frac{w_u}{w_s}. \tag{42}$$

Given (39) derived in the last section,

$$\frac{w_s L_s}{w_u L_u} = \frac{1-\psi_s}{1-\psi_u}\frac{\omega_s M_s^\rho}{\omega_u M_u^\rho}\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u}. \tag{43}$$

Recall (40), then

$$\frac{Y}{w_u L_u} = \frac{1}{(1-\alpha)(1-\psi_u)}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u}\left(\frac{\omega_s M_s^\rho}{\omega_u M_u^\rho} + 1\right) \tag{44}$$

Combining these expressions and rearranging

$$\frac{L_s}{L_u} = \frac{\frac{1}{L_u} - \frac{\eta\chi}{(1-\alpha)(1-\psi_u)}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u}\frac{w_u}{w_s}}{1 + \frac{\eta\chi}{(1-\alpha)(1-\psi_s)}\left(\frac{M_s}{A_s L_s}\right)^{\gamma_s}} \tag{45}$$

In order to retrieve an expression for $\eta\chi$, recall (41). Then

$$1-\chi=(1-\alpha)\left[1-\frac{\omega_s M_s^{\rho}}{\omega_s M_s^{\rho}+\omega_u M_u^{\rho}}(1-\psi_s)\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s}-\frac{\omega_u M_u^{\rho}}{\omega_s M_s^{\rho}+\omega_u M_u^{\rho}}(1-\psi_u)\left(\frac{A_u L_u}{M_u}\right)^{\gamma_u}\right]. \tag{46}$$

Since

$$\eta=\frac{1-\chi}{\chi}\frac{\sigma+\lambda[1-G(R)]}{\sigma+r}\frac{\tilde{x}-R}{\tilde{x}}, \tag{47}$$

then

$$\eta\chi=(1-\chi)\eta_0, \tag{48}$$

where

$$\eta_0\equiv\frac{\sigma+\lambda[1-G(R)]}{\sigma+r}\frac{\tilde{x}-R}{\tilde{x}} \tag{49}$$

Thus taking (59) into account,

$$\eta\chi=(1-\alpha)\left[1-\frac{\omega_s M_s^{\rho}}{\omega_s M_s^{\rho}+\omega_u M_u^{\rho}}(1-\psi_s)\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s}-\frac{\omega_u M_u^{\rho}}{\omega_s M_s^{\rho}+\omega_u M_u^{\rho}}(1-\psi_u)\left(\frac{A_u L_u}{M_u}\right)^{\gamma_u}\right]\eta_0. \tag{50}$$

If $\gamma_s=\gamma_u=0$ then,

$$\frac{L_s}{L_u}=\frac{\frac{1}{L_u}-\frac{\eta\chi}{(1-\alpha)(1-\psi_u)}\frac{w_u}{w_s}}{1+\frac{\eta\chi}{(1-\alpha)(1-\psi_s)}} \tag{51}$$

and,

$$\eta\chi=(1-\alpha)\left[\frac{\psi_s\omega_s M_s^{\rho}+\psi_u\omega_u M_u^{\rho}}{\omega_s M_s^{\rho}+\omega_u M_u^{\rho}}\right]\eta_0. \tag{52}$$

so that (53) becomes

$$\frac{L_s}{L_u}=\frac{\frac{1}{L_u}-\left[\frac{\psi_s\omega_s M_s^{\rho}+\psi_u\omega_u M_u^{\rho}}{\omega_s M_s^{\rho}+\omega_u M_u^{\rho}}\right]\frac{\eta_0}{(1-\psi_u)}\frac{w_u}{w_s}}{1+\left[\frac{\psi_s\omega_s M_s^{\rho}+\psi_u\omega_u M_u^{\rho}}{\omega_s M_s^{\rho}+\omega_u M_u^{\rho}}\right]\frac{\eta_0}{(1-\psi_s)}} \tag{53}$$

A.5 The skill premium

Recall (19),

$$\frac{L_s}{L_u}=\frac{1}{L_u}-\eta\chi\frac{Y}{w_u L_u}\frac{w_u}{w_s}. \tag{54}$$

Multiplying both sides by the ratio w_s/w_u,

$$\frac{w_s L_s}{w_u L_u}=\frac{1}{L_u}\frac{w_s}{w_u}-\eta\chi\frac{Y}{w_u L_u}. \tag{55}$$

Given (39) derived in the last section,

$$\frac{w_s}{w_u} = \frac{1-\psi_s}{1-\psi_u}\frac{\omega_s M_s^\rho}{\omega_u M_u^\rho}\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u}\frac{L_u}{L_s} \tag{56}$$

so that,

$$\frac{w_s L_s}{w_u L_u} = \frac{1-\psi_s}{1-\psi_u}\frac{\omega_s M_s^{\rho-\gamma_s}}{\omega_u M_u^{\rho-\gamma_u}}\frac{(A_s L_s)^{\gamma_s}}{(A_u L_u)^{\gamma_u}}. \tag{57}$$

Combining (40) and (55), and rearranging

$$\frac{w_s}{w_u} = \frac{1-\psi_s}{1-\psi_u}\frac{\omega_s M_s^\rho}{\omega_u M_u^\rho}\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u} L_u + \frac{\eta\chi}{1-\alpha}\frac{1}{1-\psi_u}\frac{\omega_s M_s^\rho + \omega_u M_u^\rho}{\omega_u M_u^\rho}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u} L_u \tag{58}$$

where, because of (41),

$$1-\chi = (1-\alpha)\left[1 - \frac{\omega_s M_s^\rho}{\omega_s M_s^\rho + \omega_u M_u^\rho}(1-\psi_s)\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s} - \frac{\omega_u M_u^\rho}{\omega_s M_s^\rho + \omega_u M_u^\rho}(1-\psi_u)\left(\frac{A_u L_u}{M_u}\right)^{\gamma_u}\right]. \tag{59}$$

Now, (58) and (59) can be combined taking into account that

$$\eta \equiv \frac{1-\chi}{\chi}\frac{\sigma + \lambda[1-G(R)]}{\sigma + r}\frac{\tilde{x} - R}{\tilde{x}}, \tag{60}$$

as

$$\begin{aligned}\frac{w_s}{w_u} &= \frac{1-\psi_s}{1-\psi_u}\frac{\omega_s M_s^\rho}{\omega_u M_u^\rho}\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u} L_u \\ &+ \frac{\eta_0}{1-\psi_u}\left(\frac{M_u}{A_u L_u}\right)^{\gamma_u}\left[1 + \frac{\omega_s M_s^\rho}{\omega_u M_u^\rho}\left(1 - (1-\psi_s)\left(\frac{A_s L_s}{M_s}\right)^{\gamma_s}\right) - (1-\psi_u)\left(\frac{A_u L_u}{M_u}\right)^{\gamma_u}\right] L_u\end{aligned}$$

where

$$\eta_0 \equiv \frac{\sigma + \lambda[1-G(R)]}{\sigma + r}\frac{\tilde{x} - R}{\tilde{x}},$$

In case $\gamma_u = \gamma_s = 0$ simplifies to

$$\frac{w_s}{w_u} = \frac{1-\psi_s}{1-\psi_u}\frac{\omega_s M_s^\rho}{\omega_u M_u^\rho} L_u + \frac{\eta_0}{1-\psi_u}\frac{L_u}{\omega_u M_u^\rho}\left[\psi_s \omega_s M_s^\rho + \psi_u \omega_u M_u^\rho\right].$$

which can be written as

$$\frac{w_s}{w_u} = \frac{1-\psi_s}{1-\psi_u}\frac{\omega_s M_s^\rho}{\omega_u M_u^\rho}\frac{1-\psi_s(1-\eta_0)}{1-\psi_s} L_u + \frac{\psi_u}{1-\psi_u}\eta_0 L_u.$$

where now $M_s = \bar{x}^{\psi_s}(A_s L_s)^{1-\psi_s}$ and $M_u = \bar{x}^{\psi_u}(A_u L_u)^{1-\psi_u}$ so that the skill premium is

$$\frac{w_s}{w_u} = \frac{1-\psi_s}{1-\psi_u}\bar{x}^{\rho(\psi_s-\psi_u)}\frac{\omega_s (A_s L_s)^{(1-\psi_s)\rho}}{\omega_u (A_u L_u)^{(1-\psi_u)\rho}}\frac{1-\psi_s(1-\eta_0)}{1-\psi_s} L_u + \frac{\psi_u}{1-\psi_u}\eta_0 L_u.$$

B Data

Wage Inequality

Definition: 90-10 percentile ratio of gross earnings for male full-time workers.

Source: OECD Earnings Database.

Labor Share

Definition: Share of wages in total income, corrected for the imputed wage of self-employed. compensation of employees * (total employment/employment of employees) / (compensation of employees + gross operating surplus and gross mixed income).

Source: OECD National Accounts.

REGREF

Definition: OECD summary indicator of regulatory impediments to product market competition. Dimensions covered are degree of public ownership, legal impediments to competition, degree of vertical integration of natural monopoly and competitive activities in network industries, market share of incumbent or new entrants in network industries, price controls in competitive activities.

Source: Conway and Nicoletti (2006).

Union Coverage

Denition: trade union density rate, i.e. the share of workers affiliated to a trade union, in percentage.

Source: OECD, Employment Outlook 2004.

Data adjustments: data for missing years are obtained by linear interpolation.

Unemployment

Definition: number of unemployed as a fraction of the labor force.

Source: OECD Main Economic Indicators.

Education Attainment

Definition: relative share of skilled workers vs. unskilled in the population measured as the ratio between the share of the population with at least a completed college degree and the share of the population with a lower educational attainment.

Source: Barro and Lee (2000)

Data adjustments: data for missing years are obtained by linear interpolation.

Employment Protection

Definition: OECD summary indicator of the stringency for Employment Protection Legislation for: Indenite contract (regular) workers Fixed-term contract (temporary) workers All contracts (measured as a simple average of indenite and xed-term contracts). Information on regular contracts include procedural inconveniences that employers face when trying to dismiss a worker; notice and several payments at different job tenures; and prevailing standards of and penalties for unfair dismissals. Information on xed-term and temporary work agency contracts include: the objective reasons under which they can be offered; the maximum number of successive renewals; and the maximum cumulated duration of the contract. Detailed data sets were collected for end of 1980s, end of 1990s and 2003 for 30 OECD countries.

Entrepreneurship

Definition: Percentage of the adult population starting or owing a business for year 2000?

Source: Global Entrepreneurship Monitor

The Skill Premium

Definition:

Source: Caselli, Francesco and John Coleman (2006).

Table 1: Wage Inequality

	$log\frac{w_{90}}{w_{10}}$			$log\frac{w_{90}}{w_{50}}$			$log\frac{w_s}{w_u}$
	1975-1984	1985-1994	1995-2005	1975-1984	1985-1994	1995-2005	1989
Australia	0.98	1.04	1.15	0.52	0.54	0.63	0.33
Austra			1.05			0.58	
Belgium		0.85			0.52		
Canada	1.24	1.36	1.24	0.51	0.55	0.56	0.32
Czech Republic			1.03			0.58	
Denmark			0.94			0.56	
Finland	0.91	0.93	0.92	0.52	0.53	0.53	
France	1.23	1.23	1.16	0.72	0.75	0.73	0.59
Germany	0.93	0.92	1.03	0.53	0.54	0.59	0.30
Greece							0.52
Hungary		1.27	1.56		0.69	0.86	
Ireland		1.36	1.35		0.67	0.70	
Italy		0.84	0.89		0.49	0.55	0.14
Japan	0.97	1.03	1.02	0.49	0.54	0.55	0.39
Luxemburg							
Netherland		0.89	1.03		0.50	0.56	0.45
New Zealand	0.79	0.89	1.04	0.46	0.49	0.59	
Norway							
Poland		1.19	1.38		0.64	0.73	
Portugal		1.37			0.84		0.61
Spain			1.34			0.75	
Sweden	0.73	0.77	0.86	0.45	0.47	0.53	0.41
Swizerland			0.88			0.54	
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

Table 2: Doing Business

	Procedures (number)	Time (days)	Cost (% of income per capita)	Min. capital (% of income per capita)
Australia	2	2	2	0
Austria	8	28	6.1	65.6
Belgium	7	56	11.1	24.1
Canada	2	3	0.6	0
Denmark	5	7	0	49.8
Finland	3	31	1.1	29.8
France	8	41	1.3	29.2
Germany	9	45	5.9	49.1
Greece	15	38	31.6	135.2
Ireland	4	18	10.4	0
Italy	9	23	16.8	22.1
Japan	11	31	10.7	74.9
Luxembourg	..	..	..	..
Netherlands	7	11	13.3	67.2
New Zealand	2	12	0.2	0
Norway	5	18	3.5	29.8
Portugal	11	78	12	40.4
Spain	10	114	16.8	17.9
Sweden	3	15	0.7	38.5
Switzerland	6	20	8.6	16.5
United Kingdom	6	13	1	0
United States	6	6	0.7	0
Continetal Europe	8	38	11.4	46.3

Table 3: REGREF and Index of Entry - OECD

	REGREF			Entry Index		
	1975-1984	1985-1994	1995-2005	1975-1984	1985-1994	1995-2005
Australia	4.1	3.8	2.1	4.4	4.1	1.4
Austra	5.1	4.5	3.1	5.0	4.6	2.5
Belgium	5.5	5.3	3.1	5.3	4.9	2.7
Canada	4.4	3.1	2.2	5.3	3.4	1.8
Czech Republic	6.0	5.7	3.8	6.0	6.0	3.3
Denmark	5.7	4.9	2.4	5.8	5.2	1.4
Finland	5.4	4.6	2.6	5.6	4.8	1.6
France	6.0	5.4	3.8	6.0	5.4	3.3
Germany	5.4	4.8	2.4	5.7	5.0	2.2
Greece	5.7	5.7	4.7	5.6	5.5	4.2
Hungary	5.9	5.8	3.9	6.0	5.9	4.0
Ireland	5.6	5.6	4.0	5.5	4.9	3.0
Italy	5.8	5.7	3.8	6.0	5.8	3.2
Japan	5.1	4.1	2.9	6.0	4.7	2.8
Luxemburg			3.2	5.4	5.3	2.9
Netherland	5.4	5.0	2.5	5.4	5.1	2.1
New Zealand	5.1	3.7	2.1	5.3	3.9	1.8
Norway	5.4	4.4	2.9	5.9	4.8	2.4
Poland	5.9	5.9	4.2	5.7	5.7	3.7
Portugal	5.9	5.4	3.6	6.0	5.7	3.5
Spain	5.0	4.8	2.9	5.3	5.2	2.9
Sweden	4.8	4.3	2.4	4.8	4.2	1.1
Swizerland	4.2	4.2	3.4	4.8	4.8	3.0
United Kingdom	4.6	3.2	1.3	4.7	3.2	1.1
United States	3.1	2.5	1.9	3.7	2.7	1.9
Continental Europe	5.5	5.1	3.3	5.6	5.2	2.8

Table 4: Firms Demographics

	Birth Rate		Churn Rate	
	Employer enterprises	Enterprise	Employer enterprises	Enterprise
Australia	15.1		8.6	
Austria				5.1
Belgium	10.4		4.8	
Canada				
Denmark	12.0	16.4	6.1	6.6
Finland	11.2		5.3	6.8
France	11.2		5.2	
Germany				
Greece				
Ireland				
Italy	11.2		5.4	5.7
Luxembourg	12.5		6.5	6.6
Netherlands	12.5		6.2	6.2
New Zealand		14.6		7.6
Norway	12.7		6.4	
Portugal	13.8		7.8	
Spain	12.6		6.6	6.2
Sweden	9.7		5.0	
Switzerland				
United Kingdom	18.1		8.2	
United States		16.3		7.7
Continental Europe	11.8			

Table 5: Percentage of Adult Population pursuing a Business Opportunity - GEM

	Starting	*Established*	*Total*
New Zealand	17.6	10.8	28.4
Australia	10.9	9.6	20.5
U.S.A	12.4	5.5	17.9
Ireland	9.8	8.1	17.9
Greece	6.5	10.5	17.0
Canada	9.3	7.4	16.7
Norway	9.3	7.3	16.5
Finland	5.0	8.6	13.6
Spain	5.7	7.7	13.4
Italy	4.9	6.4	11.4
United Kingdom	6.2	5.1	11.3
Portugal	4.0	7.3	11.3
Sweden	4.0	6.3	10.4
The Netherlands	4.4	5.7	10.0
Germany	5.4	4.2	9.6
Belgium	3.9	5.6	9.6
Austria	5.3	3.8	9.1
Denmark	4.8	4.4	9.1
France	5.4	2.3	7.6
Japan	2.2	5.4	7.6
Av EU	5.3	6.2	11.4

Table 6: Wage Inequality and REGREF - Correlations

Wage Inequality and REGREF - Correlations					
$logREGREF$	-0.236	-0.205	-0.250	-0.219	-0.144
	$(.032)^{***}$	$(.031)^{***}$	$(.031)^{***}$	$(.030)^{***}$	$(.026)^{***}$
$Union\ Coverage$		-0.320		-0.281	-0.599
		$(.072)^{***}$		$(.074)^{***}$	$(.122)^{***}$
$Unemployment$				$-.002$	$-.000$
				$(.002)$	$(.001)$
L_s/L_u			-0.985	-0.956	-1.204
			$(.289)^{***}$	$(.275)^{***}$	$(.352)^{***}$
EPL					-0.120
					$(.019)^{***}$
$N.Obs.$	203	203	203	203	169
R-sq	0.52	0.57	0.54	0.60	0.64
N. of countries	17	17	17	17	17

Table 7: The Back of the Envelope Calculation

	Actual $\frac{w_s}{w_u}$	$\frac{e}{1+L_u}$	Predicted $\frac{w_s}{w_u}$					
			$\frac{1}{1-\xi} = 1$		$\frac{1}{1-\xi} = 1.4$		$\frac{1}{1-\xi} = 1.67$	
Australia	0.84	20.47	1.03	-0.21	1.02	-0.15	1.02	-0.13
U.S.A	1.00	17.94	1.00		1.00		1.00	
Greece	0.75	16.99	0.99	0.05	0.99	0.04	0.99	0.03
Canada	0.83	16.73	0.98	0.09	0.99	0.07	0.99	0.06
Italy	0.74	11.35	0.92	0.31	0.94	0.22	0.95	0.19
United Kingdom	0.89	11.31	0.92	0.69	0.94	0.50	0.95	0.42
Sweden	0.88	10.36	0.91	0.77	0.94	0.56	0.95	0.47
The Netherlands	0.91	10.02	0.91	1.02	0.93	0.74	0.94	0.62
Germany	0.82	9.58	0.90	0.56	0.93	0.40	0.94	0.34
France	1.01	7.62	0.88	-14.80	0.91	-10.76	0.93	-9.08
Japan	0.88	7.58	0.88	0.96	0.91	0.70	0.93	0.59
Av EU	0.85	11.44	0.92	0.57	0.94	0.41	0.95	0.34