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ENTERPRISE FORMATION AND LABOR MARKET INSTITUTIONS

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Abstract

The paper introduces a model of enterprise formation in a unionized economy with labor protection and wage bargaining. Enterprise formation is subject to future market risk and is shaped by labor market institutions in the post-entry stage. The predictions of the model are tested in cross-section OECD data on 19 economies over 1978-98. Support is found for the view that enterprise formation is adversely affected by economic risks, unemployment compensation, union power, and labor protection variables.

Keywords: Entrepreneurship, labor protection, labor unions

JEL Classification: M13, J23, J24, J51

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1 Introduction

Much of the recent growth in many countries is linked to rise of risky, entrepreneurial industries. Understanding the determinants of enterprise formation and their success is the key to understanding and predicting the future relative performance of different economies. Empirical data indicates that the rate of entrepreneurship differs across OECDcountries substantially (Figure A1).[1] Only a few tentative explanations are available for this finding. Fölster-Trofimov (1996) explain the finding as a political economy equilibrium. Ilmakunnas and Kanniainen (2000) find that national macroeconomic risks, social risk insurance, the size of the public sector and differing economic structures are part of the explanation. There have been disputes for some time over whether flexible labor markets can contribute to success in expanding industries. Kanniainen and Leppämäki (2000) suggest that labor market institutions cannot be forgotten when one is looking for explanations. Apart from these studies, very little is known of the impact of labor market institutions on enterprise formation. The focus has been rather different, i.e. the impact of labor market institutions on employment, not on the market entry of those firms which create the jobs.

Various labor market institutions serve a well-understood social purpose. Risk averse individuals with firm-specific human capital need protection in conditions where markets do not provide such an insurance. As shown by Booth (1996), efficient outcome could be obtained in conditions where incumbent workers and firms bargain over wages and, say, redundancy pay. The bargaining surplus is maximized and the wage equals the opportunity cost of labor. The political reality has, however, taken a different path and perhaps for good reasons. Several job security provisions were introduced, especially in most Western European countries from the late 1950s through the early 1970s (cf. Emerson (1988)). While such measures cannot have any impact on employment in perfect markets, they do have when markets are not perfect. Analytic work (Lindbeck and Snower (1986)), Bertola (1990), Risager and Sorensen (1997)) has suggested that job provisions have stabilizing effects in labor markets. Firms tend to hire less in good times in anticipation of firing less in bad times. The effect on trend employment has been suggested to be small or absent or somewhat sensitive to demand elasticity under endogenous capital formation (Risager and Sorensen (1997)) or the persistence of shocks (Bentolila and Saint-Paul (1994)). Most empirical studies (Lazear (1990), Addison and Grosso (1996), Nickell (1997) agree that mandatory severance pay reduces employment and labor market participation rates significantly without impairing total unemployment. The exception is Scarbetta (1996) who found that employment protection regulations contribute to raising equilibrium unemployment and reducing the speed of labor market adjustment. Nickell (1997) also qualified the findings in that though job security reduces short-term unemployment it appears to increase the

[1] As entrepreneurship is hard to measure, we follow the convention of depicting the figures on self-employment, the share of those working on their own account relative to the total labor force, as a proxy.

long-term unemployment.

This research tradition has also turned out to be extremely helpful for policy discussions. However, it has overlooked the more fundamental question of the interaction between labor market institutions and enterprise formation. Over time, the employment effects come from market entry of new enterprises, not only from the internal growth of the existing firms. In this paper, we address this issue, with the following research agenda.

We introduce an analysis of allocation of individuals between entrepreneurial activities and entry to labor markets in an occupational choice model. We thereby present a theory of market entry and enterprise formation under uncertainty, including future wage bargaining and risk-sharing between unions and employers. We consider labor markets with labor unions, labor protection measures, and unemployment insurance. Redundancy pay is viewed as an insurance for non-producing (unemployed) labor, arising from the need to insure against risks in firm-specific skill. Such a human capital is created in the spirit of learning-by-doing and in the job-training. Firm-specific skill creates insider power for hired labor. Hiring means reduction of flexibility, as the firm cannot increase its employment should the good state occur. Moreover, since firing is costly in a recession, the initial hiring is forward-looking. It is assumed in the model that such mechanisms are rationally anticipated when individuals are allocated between the economic roles available.

We test the implications of the model, introducing employment protection and labor market variables into an econometric model of enterprise formation. As far as we know, there are no previous studies along these lines. Our econometric work uses OECD cross-country data on 19 economies for the years 1978-98. Our findings suggest that enterprise formation is adversely affected by economic risks, unemployment compensation, union power, and labor protection variables.

2 Hiring, Wage Negotiation, Firing

2.1 Structure of the Model

We introduce a model of market entry in a unionized economy where labor protection takes the form of redundancy pay. The previous literature (Booth (1996)) has shows that employment protection in this form is socially efficient in the first-best sense, as the redundancy pay represents insurance for labor. The efficiency property follows from simultaneous bargaining over the wage rate and redundancy pay. Many countries, however, have determined the redundancy pay in legislation. It then ceases to be an instrument for labor market participants, but is legislative and mandatory. The current model considers this case.

There are two periods. The size of the population is 1. The time line is as follows:

Figure 1: Time line of the model

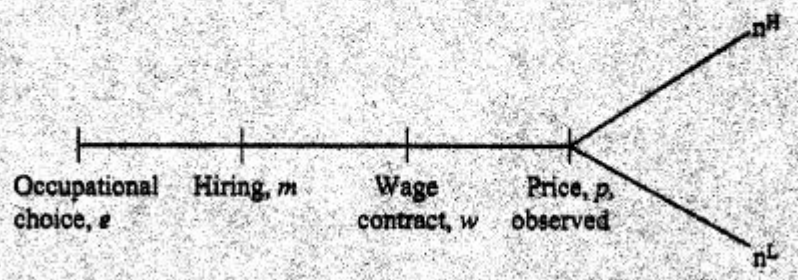
In the first stage, occupational choice takes place, given the redundancy pay, r, and the unemployment compensation, β, determined by the government. This determines the allocation of population. The number (fraction) of entering enterprises is e. They hire and train m workers. The number of non-hired unemployed is $1-em-e$, representing the "natural rate of unemployment". As non-hired unemployed do not obtain training, they do not represent an employment risk to hired labor. As a result of training, labor becomes heterogeneous. This together with the redundancy pay creates insider power. There is no output in the first period. Without loss of generality, training cost and first period wage are zero. In the second period, the wage w is determined by bargaining between the union of firms before the output price is observed. Next, output price is observed. Finally, firms adjust their employment in the spirit of the right to manage. This entails firing, depending on the observed price.

Occupational choice for each non-unemployed individual is determined by

$$E[u(\pi)] = E\left[u(w,n)\right] \tag{1}$$

where $E[u(\pi)]$ is the expected utility of income for an entrepreneur and $E[u(w,n)]$ is the expected utility from employment. The utility for an employed individual is given by $u(w) = \frac{1}{\rho}w^{\rho}$, with $\rho < 1$ where $1-\rho$ is the constant rate of relative risk aversion. Similarly, the utility of profit for an entrepreneur is given by $u(\pi) = \frac{1}{\rho}\pi^{\rho}$ After realization of price uncertainty, any individual faces the risk of being fired. The probability of keeping the job for those hired is en, as n stands for the actual employment. The probability of being hired initially but being subsequently laid off is $e(m-n)$. The probability of not being hired in the first place is $1-em-e$. Those who have been fired are eligible for redundancy pay, r, from the firm. All those unemployed are eligible for unemployment compensation, β. Thus, the probability-weighted utility of each individual who chooses not to become an entrepreneur is

Figure 1: Time line of the model



$$E\left[u(w,n)\right] = E[en\left(\frac{1}{\rho}w^{\rho}\right) + e(m-n)\left(\frac{1}{\rho}(\beta+\overline{r})^{\rho}\right) + (1-em-e)\left(\frac{1}{\rho}\beta^{\rho}\right)]. \tag{2}$$

Each employee takes e as given, and compares (2) with the expected utility of the potential profit from an enterprise.

After entry in stage 2, each firm's expected profit under optimal hiring is given by

$$E\left[\pi\right] = \max_{m}[q^{H}(p^{H}f(n^{H}) - wn^{H} - r(m-n^{H})) \tag{3}$$

$$+q^{L}(p^{L}f(n^{L}) - wn^{L} - r(m-n^{L}))] + \lambda[m-n^{H}]$$

where q^{H} and q^{L} are the probabilities of a boom and recession respectively, and where n^{H} and n^{L} are the employment levels. λ stands for the shadow price of the hiring constraint in the boom. We will assume below that $\lambda > 0$, implying that $m = n^{H}$.

2.2 Wage Bargaining

By backward induction, state-dependent labor demands are given by

$$p^{L}f'(n^{L}) = w - r, \qquad p^{H}f'(n^{H}) = w - r + \lambda \tag{4}$$

or $n^{L} = n^{L}(w, p^{L}, r)$, $n^{H} = m$. With $f(n) = n^{\gamma}, \gamma < 1$,

$$n^{L} = \left(\frac{w-r}{p^{L}\gamma}\right)^{\phi}, \quad \phi = \frac{1}{\gamma - 1}. \tag{5}$$

We obtain:

Lemma 1 *(Booth (1996)) A firm's employment in a recession is positively related to redundancy pay.*

This result follows from firing being subject to increasing cost. The firm can adjust by having less initial hiring. We plan to confirm this intuition below. On the other hand, we notice that employment in the good state is constrained by the initial hiring, resulting in potential output and profit loss. Insider power by employees is created through training, leading to firm-specific skills. With $\widetilde{\pi}^{H}(m) = p^{H}f(m) - wm$ denoting the profit function in the good state, we have by definition, $\lambda = \partial\widetilde{\pi}^{H}(m)/\partial m$ with $\partial\lambda/\partial m = p^{H}f''(m) < 0$.

To determine the contract wage w, we introduce the union preferences in terms of the expected utility of their members, employed or unemployed,

$$E\left[v(w,n)\right] = eq^H\left[n^H\left(\frac{1}{\rho}w^\rho\right) + (m-n^H)\left(\frac{1}{\rho}(\beta+\overline{r})^\rho\right)\right]$$

$$eq^L\left[n^L\left(\frac{1}{\rho}w^\rho\right) + (m-n^L)\left(\frac{1}{\rho}(\beta+\overline{r})^\rho\right)\right] \tag{6}$$

Subsequently, we impose $n^H = m$. We should notice the difference between (6) and the *ex ante* expected utility of individuals (2).

The contract wage rate is determined from the following Nash bargaining

$$N = \max_w \left\{E\left[v\right] - emu(\beta)\right\}^\alpha \left\{eE\left[\pi\right]\right\}^{1-\alpha}, \tag{7}$$

taking place before the price is observed.Thus, the risk is partially shared.We have assumed that the status quo for a firm is 0 and $u(\beta)$for the workers.[2] In the spirit of right-to-manage, employment is determined after the price is observed.

The first-order condition for (7) is

$$N_w = N\left\{\frac{\alpha E_w\left[v\right]}{E\left[v\right] - emu(\beta)} + \frac{(1-\alpha)E_w\left[\pi\right]}{E\left[\pi\right]}\right\} = 0, \tag{8}$$

which determines the bargained contract wage $w(m;r,\alpha,\beta)$. Solving for $\partial w/\partial r = -N_{wr}/N_{ww}$. From the concavity of N, $N_{ww} < 0$. It is most natural to anticipate that the contract wage will adjust in the light of a change in r, i.e. $\partial w/\partial r < 0$. Though the effect on the wage rate depends on a number of mechanisms, we show in the Appendix that most likely higher redundancy pay leads to a cut in the contract wage *ex ante*. Moreover, $\partial w/\partial\alpha = -N_{w\alpha}/N_{ww} > 0$, $\partial w/\partial\beta = -N_{w\beta}/N_{ww} > 0$.

2.3 Initial Hiring

Imposing now $n^H = m$ in the expected profit function (3), and differentiating with respect to initial hiring m, we obtain the first-order condition

$$q^H\lambda - q^L r - \left(\frac{\partial w}{\partial m}\right)\left[q^H m + q^L n^L\right] = 0. \tag{9}$$

[2] As there is no dynamics in the bargaining, we follow the literature, abstracting from strikes which migh make the bargaining power a function of the duration of the strike.

The contribution of the marginal employee to profit in the good state is λ while the profit destruction effect in the bad state is r. As $\partial w/\partial m = 0$ in competitive labor markets, it is straightforward then that $dm/dr = q^L/q^H \frac{\partial \lambda}{\partial m} < 0$. Since in a unionized economy, the initial hiring, however, has some influence on the future wage to be negotiated, $\partial w/\partial m$ need not be zero. In the case where increased initial hiring makes the bargaining position of a union stronger in the sense that $\partial w/\partial m > 0$, we definitely have $dm/dr < 0$ in a unionized economy. In the opposite case with $\partial w/\partial m < 0$, the magnitude of (the absolute value of) dm/dr is reduced.

2.4 Occupational Choice

The final task is to analyze the market entry, i.e. incentives for enterprise formation. The choice of economic role between the status of employee and entrepreneurship is determined from the individual indifference condition (1), $E\left[u(w,n)\right] = E\left[u(\pi)\right]$, or

$$E\left[en\left(\frac{1}{\rho}w^{\rho}\right) + e(m-n)\left(\frac{1}{\rho}(\beta+r)^{\rho}\right) + (1-em-e)\left(\frac{1}{\rho}\beta^{\rho}\right)\right] =$$

$$q^H\frac{1}{\rho}[p^H f(m) - wm]^{\rho} + q^L\frac{1}{\rho}[p^L f(n^L) - wn^L - r(m-n^L)]^{\rho}. \qquad (10)$$

This is an equation of one endogenous variable, e, given that the future variables m, w, n^H, n^L have all by now been solved. Differentiating (10) with respect to $\{e, r\}$,

$$\frac{de}{dr} = -\frac{E_r\left[u(w,n)\right] - E_r\left[u(\pi)\right]}{E_e\left[u(w,n)\right] - E_e\left[u(\pi)\right]}. \qquad (11)$$

As this expression is quite involved, one can determine only the sign of some of the partials with certainty. Obviously $E_e\left[u(w,n)\right] > 0$, as more active enterprise creation is also beneficial to labor. Moreover $E_e\left[u(\pi)\right] = 0$ in the denominator. In the numerator, it is most natural to expect that $E_r\left[u(w,n)\right] > 0$, $E_r\left[u(\pi)\right] < 0$. In this case, we definitively have $de/dr < 0$. However, though these latter conditions are likely they cannot be analytically determined with certainty. We therefore rely on the econometric verdict, which we will find out in the next section. Similarly, we find that (again very likely) $\partial e/\partial\alpha < 0$, $\partial e/\partial\beta < 0$.

As the firing cost reduces the probability for each individual to be employed, it tends to raise unemployment and thereby increase the attractiveness of entering as an entrepreneur in the first stage instead of entering the tight labor

market. This is clearly a real possibility in an economy with some unemployment inherited from, say the past. We would then expect $\partial e/\partial \omega > 0$, where $\omega =$ the inherited unemployment. Though this argument falls somewhat outside the current analytic model, its validity raises an important empirical question. Indeed, some empirical studies have previously reported that unemployment may interact with enterprise formation.[3]

Finally, it is clear that increased price uncertainty in the sense of a mean-preserving spread in (p^H, p^L) reduces the market entry, as the expected profit becomes more risky.[4]

Equilibrium entrepreneurship thus reads as

$$e = e\left(p^H - p^L, r, \beta, \alpha, \omega\right) \tag{12}$$

with the comparative static results summarized as

Proposition 2 $\partial e/\partial(p^H - p^L) < 0, \partial e/\partial r < 0, \partial e/\partial \beta < 0, \partial e/\partial \alpha < 0, \partial e/\partial \omega > 0$.

In the next section, these propositions will be subject to econometric testing.

3 Econometric Results

3.1 Estimation procedure and the principles in data decisions

(i) Labor market institutions differ across countries, facilitating testing the predictions of the model in cross-country data. Given the limited number of countries with available data, we chose to include data on the same countries several times. A five-year interval is sufficiently long to implement this approach. Annual data were not considered appropriate for the additional reason that one should interpret the rate of entrepreneurship as a long-run structural property of an economy.[5] Our data sources are documented at the end of the paper.

(ii) The available data set does not allow for differentiating those who are purely self-employed from those who also employ other people. We follow the tradition by working with the data on the self-employed.

(iii) The estimates presented in the tables are from the OLS estimation of the model without fixed country effects, the two country group variables explained below being included, instead. The main reason for estimating the model in this way is that there is only one observation for each country on

[3] We can refer, for example, to Parker (1996) on this matter.

[4] This is the standard Rotschild-Stiglitz (1970) effect. An entrepreneur is not protected by an insurance while the labor has access to unemployment insurance.

[5] This procedure is in principle the same as in Ilmakunnas and Kanniainen (2000).

some of the variables. These variables would therefore be perfectly correlated with the country dummy variables. One could also argue that in this kind of setting, where most of the variation in the data comes from the cross-sectional variation rather than from variation over time, fixed-effect estimation may purge much of the interesting variation in the data and actually increase the problems created by measurement errors. This problem arises often e.g. in firm panels (see Griliches and Mairesse, 1995) and country panels (see Temple, 1999). One solution, suggested by Temple (1999), is to use carefully selected country group variables, the approach we use here.

(iv) To avoid any potential simultaneity problems and the problem of reversed causality we allow for a three-year lag between entrepreneurship and those explanatory variables which are subject to time variation (union density, bargaining coverage, union variables, unemployment rate).

3.2 Model Specification

We will carry out an econometric analysis testing the hypotheses in cross-country data on 19 OECD countries (see below and the Appendix) for 1978, 1983, 1988, 1993, 1998 i.e. at five-year intervals. The number of observations is thus 95. The econometric model of entrepreneurship to be estimated can be written as

$$e_{it} = \gamma_0 + \gamma_1 S_i + \gamma_2 LM_i^j + \gamma_d D_d + \varepsilon_{it} \tag{13}$$

where e_i stands for the rate of entrepreneurship in country i, i=1,...,19; t = 1978, 1983, 1988, 1993, and 1998. Variable e_i represents the empirical counterpart of our theoretical e-variable. Country group dummy variables and year dummies are denoted by D_d. Variable ε_{it} stands for the error term with $E[\varepsilon_{it}] = 0, E[\varepsilon_{it}]^2 = s^2$, $E[\varepsilon_{it}\varepsilon_{it-d}] = E[\varepsilon_{it}\varepsilon_{jt}] = 0$. The following country-specific variables enter the econometric analysis:

e_i= rate of entrepreneurship is measured as the ratio of people working on their own account relative to the total labor force

S_i = national economic risk, measured by the conditional standard deviation of detrended log GDP. For each country, we estimated a linear trend equation for log GDP over the period 1970-1992, and divided the square root of the conditional variance by the average GDP. (The risk variable will be lagged by three years). We thus work with the assumption that local (within-country) risks are perfectly correlated, but there is no cross-country correlation in risks. While Parker (1996) used the number of strikes to proxy the risk faced by entrepreneurs, measuring the turbulence of industrial relations, we note that our risk measure is analogous to that in Bird (1998).

$LM_i^1 = \beta$, the replacement ratio, measuring the degree of unemployment compensation relative to labor income on average. (The unemployment compensation variable is in a sense also an indirect measure of union power, as unions influence fiscal policy as an interest group.)

$LM_i^j = r$, labor market regulation variables, $j = 2, ..., 5$. These variables measure the strictness of country-specific employment protection legislation (EPL), obtained from Nicoletti, Scarpetta and Boylaud (1999). There are four different country rankings (all constructed in a slightly different manner) according to the stringency of EPL. The ranking order is ascending, so that the country with the least strict EPL scores 1 and the country with the strictest EPL scores 19. For more detailed description of the variables, see Appendix (data sources).

$LM_i^j = \alpha$, labor union power, $j = 6, ..., 9$. We have four variables measuring the degree of so-called "corporatism", "centralisation" and "co-ordination" defined as follows:

$*LM_i^6$= trade union density rate (measuring "corporatism")

$*LM_i^7$ = bargaining coverage rate (measuring "corporatism")

$*LM_i^8$ = centralization variable which characterizes the wage-setting system. Centralization describes the locus of the formal structure of wage bargaining. Three levels are distinguished: the national or central bargain negotiated between peak organizations, which may cover the whole economy (centralized bargaining); negotiations between unions and employers' associations regarding conditions of work for particular industries (intermediate bargaining); and firm-level bargaining between unions and management (decentralized bargaining). The countries are given scores from 1 to 3 according to their degree of centralization with higher scores reflecting more centralized bargaining.

$*LM_i^9$ = co-ordination, analyzing the degree of consensus between the collective bargaining partners. Again, the countries get scores from 1 to 3 with higher scores reflecting tighter co-ordination among unions.

$*LM_i^{10}, \omega$ = unemployment rate, lagged by three years.

D_d = dummy variables: the Mediterranen dummy MED accounts for differences between the industrial structures of the Mediterranean countries and the other countries in the data set, the the US dummy USD accounts for the exclusion of owner-managers from the definition of an entrepreneur, year dummies $YD1, ..., YD5$.

3.3 Estimation Results

3.3.1 Diagnostic checks of the model

We introduce the following diagnostics to check the model specification: (i) We use White's (1980) heteroscedasticity test of residuals and we report the corrected t-statistics from the heteroscedasticity-consistent covariance matrix. (ii) To test the normality of the error term, we use the Jarque-Bera test. (iii) We also introduce Ramsey's RESET test in order to test the adequacy of the model specification, including omitted variables, incorrect functional form, and correlation between the regressors and the residuals.

3.3.2 Results

The results are reported in Tables 1-2. It turns out that the explanatory power of the model is relatively high, even allowing for the risk effect and the structural effects only. There appears to be some heteroscedasticity in some models. We therefore report White's adjusted t-values throughout.

The Mediterranean and US dummies are both significant and will be included. The Jarque-Bera tests do not typically cause alarm about deviations from the normality of residuals. The RESET test generally accepts the specification giving, however, slightly higher p-values for equations involving union variables (Table 2, $LM^6 - LM^9$) than equations testing for the effect of employment protection.

(i) Risk effect

The coefficient estimate of the risk variable appears to be negative and statistically significant in all regression equations. Such a finding supports the basic theory of the negative impact of aggregate risks on entrepreneurship. Thus an increase in aggregate risk reduces the equilibrium entrepreneurship. The risk variable typically obtains a significant negative coefficient estimate in the region (-0.074,-0.078) with t-values exceeding 5.0 in absolute value in most cases. This finding is analogous to that previously reported by Ilmakunnas and Kanniainen (2000).

Table 1. *Effect of Replacement Ratio and Labor Market Regulation*

Variables	**I**	**II**	**III**	**IV**	**V**
Constant (C)	0.139	0.131	0.129	0.126	0.127
	[15.733]	[15.018]	[15.085]	[13.937]	[14.685]
Risk (S)	−0.049	−0.071	−0.068	−0.070	−0.071
	[−3.213]	[−5.947]	[−5.743]	[−5.920]	[−6.071]
Labor Market Variables:					
LM^1	−0.051				
	[−4.006]				
LM^2		−0.002			
		[−3.408]			
LM^3			−0.002		
			[−2.789]		
LM^4				−0.001	
				[−2.034]	
LM^5					−0.001
					[−2.304]
Mediterranean	0.077	0.100	0.098	0.095	0.095
Dummy (MED)	[9.456]	[12.631]	[11.964]	[11.053]	[12.193]
USA Dummy	−0.026	−0.035	−0.034	−0.031	−0.031
(USD)	[−6.439]	[−6.127]	[−5.964]	[−5.249]	[−5.316]
Diagnostic test:					
Adj. R-squared	0.710	0.700	0.694	0.687	0.688
S.E. of Regression	0.021	0.021	0.021	0.022	0.022
F-statistic	29.812	28.400	27.703	26.762	26.925
$[p-value]$	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
White test for HS	25.580	16.015	12.849	10.128	14.397
$[p-value]$	[0.004]	[0.099]	[0.232]	[0.429]	[0.156]
Ramsey's RESET test	0.979	2.640	2.397	2.413	3.710
$[p-value]$	[0.325]	[0.108]	[0.125]	[0.124]	[0.057]
Jarque-Bera test	7.889	2.640	3.616	3.250	2.052
$[p-value]$	[0.019]	[0.267]	[0.164]	[0.197]	[0.358]

White's t-values in parenthesis; coefficients of year dummies not reported

Table 2. *Effect of Labor Unions and Unemployment*

Variables	**VI**	**VII**	**VIII**	**IX**	**X****
Constant (C)	0.120	0.139	0.139	0.125	0.125
	[13.055]	[11.292]	[10.905]	[10.023]	[11.017]
Risk (S)	−0.067	−0.067	−0.058	−0.059	−0.032
	[−5.582]	[−6.590]	[−5.316]	[−5.726]	[−2.333]
Labor Market Variables:					
LM^1					−0.067
					[−5.388]
LM^6	−0.016				
	[−1.317]				
LM^{7*}		−0.034			
		[−2.719]			
LM^{8*}			−0.015		
			[−2.467]		
LM^{9*}				−0.006	
				[−1.319]	
LM^{10}					0.139
					[2.208]
Mediterranean	0.081	0.075	0.072	0.070	
Dummy (MED)	[11.703]	[17.521]	[16.163]	[14.227]	
USA Dummy	−0.026	−0.039	−0.034	−0.027	−0.026
(USD)	[−4.953]	[−4.766]	[−4.934]	[−4.227]	[−7.456]
Diagnostic test:					
Adj. R-squared	0.664	0.633	0.633	0.599	0.322
S.E. of Regression	0.022	0.019	0.019	0.020	0.018
F-statistic	23.755	19.119	19.099	16.695	9.768
$[p-value]$	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
White-test for HS	11.871	7.042	11.433	7.540	14.438
$[p-value]$	[0.294]	[0.722]	[0.325]	[0.674]	[0.044]
Ramsey's RESET test	1.713	1.319	0.628	1.239	0.288
$[p-value]$	[0.194]	[0.254]	[0.431]	[0.269]	[0.593]
Jarque-Bera test	3.618	2.673	3.170	4.274	8.921
$[p-value]$	[0.164]	[0.263]	[0.205]	[0.118]	[0.012]

White's t-values in parenthesis; coefficients of year dummies not reported
*Data on Ireland and Greece not available
**Mediterranean data and year dummies excluded

(ii) Unemployment compensation and labor market regulation

Unemployment compensation measured by the replacement variable can be given two alternative interpretations. First, it increases the opportunity cost of entering the market as an entrepreneur. Second, it is often influenced by union actions, measuring union power indirectly. Its impact is negative and significant. Tests with labor market regulation variables produce statistically significant information. All variables representing labor market regulation ($LM^2 - LM^5$) behave as predicted by the model and their regression coefficients are statistically significant. They all obtain t-values which exceed 2 in absolute value.

(iii) Union effect

The union effect was measured by several variables. They all obtain negative coefficients as predicted by the model. The union density variable LM^6 obtains a coefficient with a t-value of -1.317. This is not statistically significant. The bargaining coverage variable, LM^7, obtains a coefficient which is highly significant, its t-value being t = -2.719. These results indicate that it is not the rate of membership which is the key determinant; rather it is the bargaining power. For example, the union membership rate in Spain or France is very low, in the range of 10-20 %. However, the bargaining coverage is about 80-90 %. The variable measuring centralization of wage bargaining is also statistically significant, with a t-value of t = -2.467. The coordination variable has the predicted sign but its t-value is somewhat lower. Taken together, this evidence indicates quite strongly that union power reduces the entry of new enterprises, as suggested by the theory in section 2.

(iv) Unemployment effect

Unemployment is expected to exert both a direct and indirect effect on entrepreneurship. First, an increased risk of unemployment makes it less attractive to enter the labor market as an employee. This is the direct effect. The indirect effect operates through the union wage. High wages reduce the optimal size of enterprises and labor demand, making entrepreneurship a more attractive option. Our results support such a view. Unemployment is found to be a significant determinant of entrepreneurship, apparently through greater self-employment.

3.4 Conclusions

There are a number of insightful results reported by our study, which suggests that economic risks shape the allocation of human capital between entrepreneurs and labor supply. In the light of our findings, the Knightian view of entrepreneurs as risk-takers re-emerges as an empirically valid paradigm. By implication, a desire for stabilization is the most important policy implication.

Among its many dimensions, the main focus of the current paper has been the interaction between private enterprise formation, entrepreneurship and the labor markets. We introduced a rather stylized model which, however, is rich

enough to organize the discussion and form the theoretical foundation for aggregate econometric analysis. Such an analysis was carried out on the basis of cross-country data on a set of OECD countries. Several complementary tests were introduced. The results confirm the proposition that labor market institutions are not neutral with regard to enterprise formation. By implication, another specific link has thus been identified between labor markets and employment growth.

Appendices

1. *Comparative Statics of the Contract Wage*

By differentiation,

$$N_{wr} = N(\alpha \frac{E_{wr}(v)[E(v) - emu(\beta)] - E_w(v)E_r(v)}{[E(v) - emu(\beta)]^2} +$$

$$(1-\alpha)\frac{E_{wr}(\pi)E(\pi) - E_w(\pi)E_r(\pi)}{[E(\pi)]^2}).$$

By the envelope theorem, $E_r[\pi] = -q^L(m - n^L) < 0$ and $E_w[\pi] = -(q^H n^H + q^L n^L) < 0$. Moreover, $E[\pi] > 0$ and $E_{wr}[\pi] = -q^L \partial n^L/\partial r < 0$. The second term is always negative. In the first term, $E_w(v)E_r(v) > 0$ as both $E_w(v) > 0$ and $E_r(v) > 0$. Although the sign of $E_{wr}(v)$ remains ambiguous, there is no special reason to hesitate in assuming that $N_{wr} < 0$.

Similarly the signs of $\partial w/\partial\alpha$ and $\partial w/\partial\beta$ can be determined by developing the signs of $N_{w\alpha}$ and $N_{w\beta}$. By differentiating with respect to α we obtain

$$N_{w\alpha} = N\left\{\frac{E_w(v)}{E(v) - emu(\beta)} - \frac{E_w(\pi)}{E(\pi)}\right\},$$

which clearly is always positive. Hence, $\partial w/\partial\alpha > 0$. Similarly, $N_{w\beta}$ reads as:

$$N_{w\beta} = N\left\{\alpha\left(\frac{E_{w\beta}(v)\left[E(v) - emu(\beta)\right] - E_w(v)\left[E_\beta(v) - emu'(\beta)\right]}{\left[E(v) - emu(\beta)\right]^2}\right)\right\}.$$

Since $E_{w\beta}(v) = eq^L\left(-\frac{\partial n^L}{\partial w}u'(\beta + r)\right) > 0$ and $[E_\beta(v) - emu'(\beta)]$

$= e\left[q^L\left(m - n^L\right)u'(\beta + r) - mu'(\beta)\right] < 0$ (noting that $u'(\beta)$ must always exceed $u'(\beta + r)$) the whole nominator must be positive. Thus, $\partial w/\partial\beta > 0$.

2. *Data Sources*

The data we use has been constructed as reported below and includes the following countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, and the USA.

* The rate of entrepreneurship (e) is measured by the ratio of people working on their own account (excluding farmers), source: Labour Force Statistics, OECD 1997 and 1999. There are some classification differences. For example, the US data do not include owner-managers among entrepreneurs. Such differences will be taken into account by national dummies. The cross-section consists of data on 1978, 1983, 1988, 1993, 1998 i.e. five year intervals for 19 OECD countries. In many European countries some services like health care are produced by the public sector instead of the private sector. For this reason, there will be some differences in the figures on entrepreneurship in the data.

* National economic risk (S) is measured by the relative trend deviations of real GDP over the period 1970-1992 (the ratio of the conditional standard deviation in a regression of the logarithmic GDP with time trend relative to the average of the log GDP). Data source: Penn World Tables.

* The replacement ratio, LM^1, was obtained from Layard, Nickel and Jackman (1991). Its value at the beginning of the 1990s is used for each country; it is not possible to obtain reliable comparable data for all years.

* The country-specific strictness of the employment protection legislation, LM^2, LM^3, LM^4 and LM^5 was obtained from Table 14 in Nicoletti, Scarpetta and Boylaud (1999). The first one, LM^2, was constructed by them using factor analysis to aggregate detailed indicators of each domain of EPL into a summary indicator of the strictness of regulation. These OECD countries were then ranked in ascending order according to the summary indicator denoted by LM^2 . Variables LM^3 and LM^4 are country rankings proposed in the1999 OECD Employment Outlook. LM^3 is based on a summary indicator with uniform weights across countries and LM^4 is based on a summary indicator with "subjective" weights. LM^5 is a ranking reflecting the summary indicator based on the extension of Grubb and Wells (1993) ranking-of-ranking approach (see OECD Jobs Study 1994). All the four different rankings are based on regulatory indicators in the late 1980s. Those rankings are not available for other time periods.

* Labor union power is measured by four variables, LM^6, LM^7, LM^8 and LM^9. Source: OECD Employment Outlook, 1991, 1997. As information on unions is not available for 1995, data for 1994 is used instead. Moreover, data for LM^7, LM^8 and LM^9 are not available for 1975 and 1985. In these years, figures from 1980 and 1990 respectively are used instead.

* The unemployment rate (LM^{10} or LM^{11}) is measured as the percentage of unemployed labor in the civilian labor force. Source: Labour Force Statistics, OECD 1999.

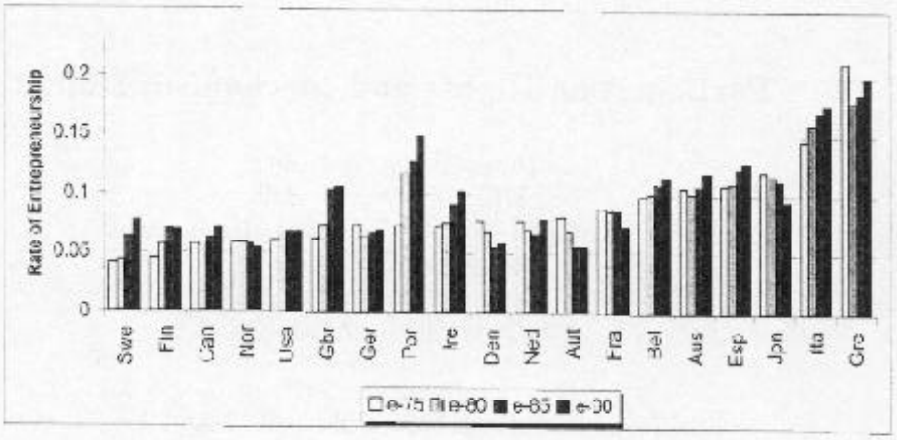


Figure 2: Development of entrepreneurship in OECD countries.

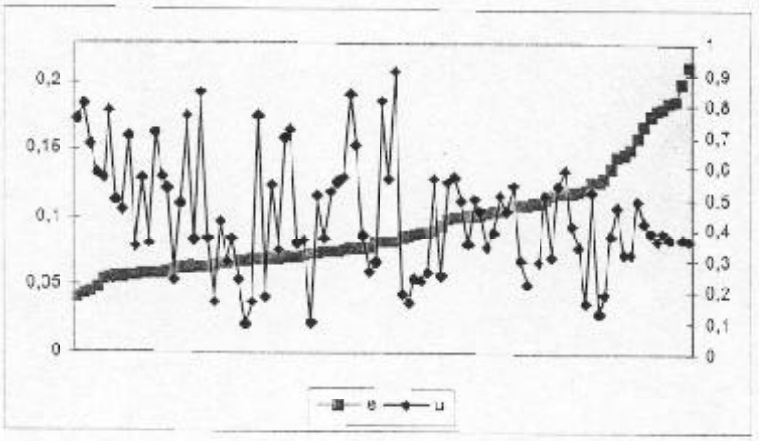


Figure 3: Rate of entrepreneurship (e) and union density (u) in 19 OECD countries. Construction: observations in entrepreneuship in increasing order, with union density rates correspondingly.

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