

EXPLAINING CROSS-NATIONAL VARIATIONS IN ENTREPRENEURSHIP: THE ROLE OF SOCIAL PROTECTION AND POLITICAL CULTURE

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I. INTRODUCTION

Among academics and policy-makers, there is increasing recognition of the importance of a successful entrepreneurial sector to the promotion of wealth creation and economic prosperity.¹ However, there remains considerable debate over the question of what kind of economic environment provides the best conditions for entrepreneurial activity. In the literature on entrepreneurship, a long line of work dating back to the seminal contribution of Knight emphasizes the role of entrepreneurs as risk takers, who seek out new opportunities and develop new products and processes in an environment of uncertainty.² Under this view, the agents in an economy who are drawn into entrepreneurship are those with the least aversion to risk.³ However, formal theoretical models generate ambiguous predictions concerning the effects of an increase in risk on the rate of entrepreneurship in an economy. A priori, therefore it is unclear whether mechanisms designed to reduce the degree of risk

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1. See, e.g., Zoltán J. Acs et al., *Growth and Entrepreneurship: An Empirical Assessment* CENTRE FOR ECON. POL'Y RES., Discussion Paper No. 5409 (2005); David Audretsch & Max Keilbach, *Entrepreneurship Capital and Economic Performance*, 38 REGIONAL STUD. 949 (2004); Jolanda Hessels, André van Stel, Peter Brouwer & Sander Wennekers, *Social Security Arrangements and Early-Stage Entrepreneurial Activity*, 28 COMP. LAB. L. & POL'Y J. 743 (2007).

2. FRANK H. KNIGHT, *RISK, UNCERTAINTY AND PROFIT* (University of Chicago Press 1971) (1921).

3. See, e.g., Richard E. Kihlstrom & Jean-Jacques Laffont, *A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion*, 87 J. POL. ECON. 719 (1979).

faced by individuals in an economy will tend to promote or discourage the level of entrepreneurship.

In economies throughout the world, governments have developed a variety of social protection mechanisms that aim to protect individuals against the risk of fluctuations in the economic environment. These include the provisions of benefits to individuals out of work, regulations to protect workers against the threat of dismissal, and the provision of welfare benefits in times of sickness and ill health. In this paper, we seek to examine whether mechanisms aimed at reducing individuals' exposure to the risk of shocks to the economy help to promote entrepreneurial activity or whether instead they tend to discourage entrepreneurship, perhaps by restricting the rewards for entrepreneurial success.

A number of previous studies have found evidence of a negative relationship between the level of unemployment benefits and the rate of self-employment in an economy (which is often taken as a proxy for the prevalence of entrepreneurship),⁴ though work by Torrini suggests that this relationship may be non-robust.⁵ In addition, work has been done on examining the relationship between self-employment and the strictness of employment protection legislation in an economy and here too there is conflicting evidence. While studies by Grubb and Wells and the OECD find evidence of a positive relationship between the strictness of employment protection legislation and the rate of self-employment,⁶ more recent work by Robson and Torrini using pooled cross-section time-series data has cast doubt on the validity of these findings.⁷

In each of these areas, the work that has been done has focused on experiences in the developed market economies of the OECD. In contrast, the current study examines data from a much broader cross-section of countries, including a range of less developed and middle-income economies, the transition economies of Eastern Europe and the former Soviet Union, and China. Drawing on a dataset compiled by Botero et al., we examine the relationship between the level of

4. See, e.g., Pekka Ilmakunnas & Vesa Kannianen, *Entrepreneurship, Economic Risks, and Risk Insurance in the Welfare State: Results with OECD Data 1978-93*, 2 GERMAN ECON. REV. 195 (2001); Simon C. Parker & Martin T. Robson, *Explaining International Variations in Entrepreneurship: Evidence from a Panel of OECD Countries*, 71 S. ECON. J. 287 (2004).

5. *Contra* Roberto Torrini, *Cross-Country Differences in Self-Employment Rates: The Role of Institutions*, 12 LAB. ECON. 661 (2005).

6. See David Grubb & William Wells, *Employment Regulation and Patterns of Work in EC Countries*, 21 OECD ECONOMIC STUDIES 7 (1993); OECD, *EMPLOYMENT OUTLOOK* (1992) [hereinafter OECD, 1992]; OECD, *EMPLOYMENT OUTLOOK* (1999) [hereinafter OECD, 1999].

7. *Contra* Martin T. Robson, *Does Stricter Employment Protection Legislation Promote Self-Employment?*, 21 SMALL BUS. ECON. 309 (2003); Torrini, *supra* note 5.

social protection in an economy and measures of the incidence of entrepreneurship.⁸

In studying this relationship, we make allowance for the effect that the institutional and political environment within an economy may have in shaping attitudes to entrepreneurship and the incentives that individuals have to engage in entrepreneurial activity. In particular, we examine the effect of regulations that govern the administrative requirements for starting up a business and include an indicator variable for whether a country is a current or former centralized command economy. The latter is included in recognition of the lasting effects that might be experienced in such economies as a legacy of the system of central planning and a communist political culture that tended to take an unfavorable or even hostile stance toward self-employment and entrepreneurship.

The outline of the rest of the paper is as follows. In Section II, we discuss the specification of the empirical models to be estimated in the paper and describe the data used in the analysis. The following section reports details of the regression results, while section IV presents the main conclusions of the study.

II. MODEL SPECIFICATION AND DATA

We follow convention and use the rate of self-employment as our main proxy for the level of entrepreneurship in an economy. We use measures both of total self-employment and the percentage of own-account workers, i.e., self-employed individuals without employees. Additionally, in view of the well-known limitations of self-employment as a measure of entrepreneurship, for a smaller sample of countries we use data from the Global Entrepreneurship Monitor (GEM) on the prevalence of nascent entrepreneurship, where the latter is defined as the number of people actively attempting to start a business as a percentage of the adult population.⁹

8. Juan C. Botero et al., *The Regulation of Labor*, 119 Q. J. ECON. 1339 (2004).

9. In addition to the conceptual issue of whether self-employment can truly be viewed as synonymous with entrepreneurship—a view that might be considered particularly contentious in the context of self-employment in less developed economies—there are measurement issues as well, relating to differences between countries in the way that self-employment is defined. For instance, in some countries only own account workers are included in the definition of self-employment, while in other countries the definition is extended to include self-employed individuals who employ others. To some extent, the latter problem is addressed in the current study through the estimation of separate equations for the rate of total self-employment and the percentage of own account workers. However, the effects of other national differences in data definitions will remain. In principle, this problem could be addressed through the estimation of fixed effects panel data models. However, constraints on data availability—in particular on the

We obtain data on the rate of self-employment from the ILO Yearbook of Labour Statistics for a total of sixty-six countries. In the year 2001, this ranged from a high of 44.8% in Columbia to a low of 6.8% in Norway, with an average across the countries in our sample of 23.1% (see Table 1). In general, rates of self-employment tend to be highest in less developed economies, an observation that has been documented formally in studies by a number of authors, including Schulz, Yamada, and Iyigun and Owen.¹⁰ In contrast, Acs et al. argue for the existence of a U-shaped relationship between the rate of self-employment and the level of economic development.¹¹

availability of measures of social protection for a sufficiently broad cross-section of economies—preclude such an approach in the current study.

10. Murat F. Iyigun & Ann L. Owen, *Risk, Entrepreneurship and Human Capital Accumulation*, 88 AM. ECON. REV., PAPERS AND PROC. 454 (1998); Paul T. Schultz, *Women's Changing Participation in the Labor Force: A World Perspective*, 38 ECON. DEV. & CULTURAL CHANGE 457 (1990); Gustavo Yamada, *Urban Informal Employment and Self-Employment in Developing Countries: Theory and Evidence*, 44 ECON. DEV. & CULTURAL CHANGE 289 (1996).

11. Acs et al., *supra* note 1

Table 1
Self-Employment as a Percentage of All Persons in Employment,
2001

<i>Highest</i>	(%)
Colombia	44.8
Indonesia	44.7
Madagascar	43.7
Dominican Republic	43.5
Peru	43.1
Pakistan	43.0
Kyrgyz Republic	42.5
Zambia	40.6
Kazakhstan	39.9
Vietnam	38.6
<i>Lowest</i>	(%)
Latvia	10.3
Sweden	10.0
Germany	9.9
United Kingdom	9.5
France	8.9
Denmark	8.8
Tanzania	8.3
Uruguay	7.3
Senegal	7.0
Norway	6.8
Average (n = 66)	23.1%
Standard deviation	11.61

Note: The data refer to the rate of total self-employment including own-account workers and self-employed individuals who employ others.¹²

GEM data on the rate of nascent entrepreneurship is available for the year 2002 for a smaller sample of thirty-six countries.¹³ Table 2 shows that within this sample the rate of nascent entrepreneurship ranged from a maximum of 11.6% in Thailand to a minimum of 0.9%

12. ILO Yearbook of Labour Statistics.

13. I am grateful to André van Stel and Roy Thurik for providing me with a copy of this data.

in Japan. Unsurprisingly, for the thirty-two countries for which we have data on both the rate of self-employment and the rate of nascent entrepreneurship there is a fairly close correspondence between the two measures (see Figure 1).¹⁴ Note however, that while the rate of self-employment provides a proxy for the level of entrepreneurship at a particular point in time, the rate of nascent entrepreneurship provides a picture of the dynamics of entrepreneurship.

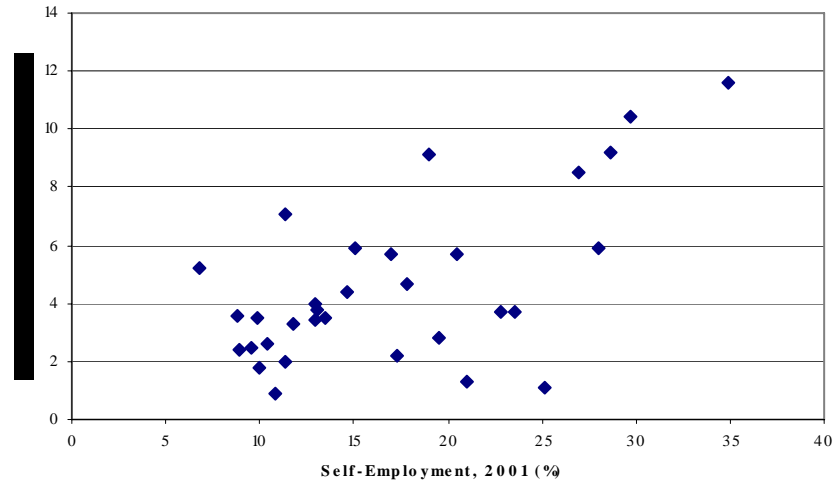
14. The correlation coefficient between the two series is 0.61.

Table 2
Nascent Entrepreneurs as a Percentage of the Adult Population, 2002

<i>Highest</i>	(%)
Thailand	11.6
India	10.9
Chile	10.4
Mexico	9.2
New Zealand	9.1
Argentina	8.5
United States	7.1
Canada	5.9
Korea	5.9
Brazil	5.7
<i>Lowest</i>	(%)
Netherlands	2.6
United Kingdom	2.5
France	2.4
Spain	2.2
Belgium	2.1
Hong Kong	2.0
Sweden	1.8
Taiwan	1.3
Russian Federation	1.1
Japan	0.9
Average	4.6%
Standard deviation	2.81

Source: Data from the Global Entrepreneurship Monitor (GEM).

Figure 1
Scatter Plot of the Self-Employment Rate and the Rate of Nascent Entrepreneurship, Thirty-Two Countries



Note: The data refer to total self-employment as a percentage of all persons in employment and GEM data on the number of nascent entrepreneurs as a percentage of the adult population.

In examining the empirical relationship between social protection and entrepreneurship it is important to control for other factors, apart from political culture, that might help to influence the rate of self-employment in an economy. As noted above, the level of economic development of the economy is likely to be a significant factor. To control for this, we include in the list of explanatory variables the log of real per capita GNP. In addition, we include the share of employment in agriculture as a percentage of total employment as this sector tends to account for a relatively high proportion of output and employment in less developed economies, and is often characterized by a relatively high incidence of self-employment.

As economies develop, resources tend to shift out of the agricultural sector, first into manufacturing and then later into services. While much of manufacturing industry tends to be characterized by a relatively high minimum efficient scale relative to total output and thus a relatively low rate of self-employment, in the service sector the prevalence of small-scale operations tends to be much greater. Other things equal, therefore, we might expect to observe a positive relationship between the rate of self-employment in

an economy and the size of the service sector and we allow for this by including the share of service sector employment as a percentage of total employment as one of the explanatory variables in our models.

In the literature on self-employment and entrepreneurship, there is considerable debate over the extent to which the propensity for self-employment is influenced by measures of formal education. While there is general agreement that entry and survival in entrepreneurship is likely to be facilitated by the possession of entrepreneurial human capital, there is no clear consensus on how this concept should best be measured. Evidence both from microeconomic analyses and studies using more aggregated data produces mixed findings concerning the influence of measures of formal education on the incidence of self-employment, and a reason for this may be that the skills that are required for a successful career in entrepreneurship are only weakly proxied by such measures.¹⁵ Nonetheless, in the absence of better proxy variables, we include a measure of the average number of years of schooling among members of the adult population in our regressions to try to capture the effect that differences in levels of entrepreneurial human capital may have on the incidence of entrepreneurship across countries.

A. Measures of Social Protection

As our primary indicator of the influence of social protection on the incentives for entrepreneurship, we focus on the role of the unemployment benefit system in an economy. As noted in the Introduction, the influence of the level of unemployment benefits has

15. Studies that find a positive effect of education on the probability of self-employment include Rees and Shah, Evans and Leighton, and Henley, while studies by Evans, de Wit and van Winden, and Kidd report that a higher level of education reduces entry into self-employment. Compare Hedley Rees & Anup Shah, *An Empirical Analysis of Self-Employment in the UK*, 1 J. APPLIED ECONOMETRICS 95 (1986), David S. Evans & Linda S. Leighton, *Some Empirical Aspects of Entrepreneurship*, 79 AM. ECON. REV. 519 (1989), and Andrew Henley, *Self-Employment Status: The Role of State Dependence and Initial Circumstances*, 22 SMALL BUS. ECON. 67 (2004), with M.D.R. Evans, *Immigrant Entrepreneurship: Effects of Ethnic Market Size and Isolated Labor Pool*, 54 AM. SOC. REV. 950 (1989), Gerrit de Wit & Frans A.A.M. van Winden, *An Empirical Analysis of Self-Employment in the Netherlands*, 1 SMALL BUS. ECON. 263 (1989), Michael P. Kidd, *Immigrant Wage Differential and the Role of Self-Employment in Australia*, 32 AUSTL. ECON. PAPERS 92 (1993). Interestingly, Burke, Fitzroy, and Nolan find that amongst workers in the United Kingdom while possession of formal educational qualifications tends to reduce the probability of self-employment, individuals who have participated in apprenticeship training are more likely to be self-employed. Andrew W. Burke, Felix R. Fitzroy & Michael A. Nolan, *When Less is More: Distinguishing Between Entrepreneurial Choice and Performance*, 62 OXFORD BULL. ECON. & STAT. 565 (2000). This suggests that the practical skills developed during the course of an apprenticeship may be more relevant to a career in entrepreneurship than formal academic qualifications.

been examined in a number of previous studies. In general, the underlying hypothesis in these studies is that a high level of unemployment benefits—in particular, a high ratio of benefits to wages—encourages unemployed workers to wait longer for job openings in the paid-employment sector and discourages them from entering self-employment. Alternatively, however, it might be the case that through providing a social safety net in the event of business failure a generous system of unemployment benefits could actually encourage individuals to experiment with a career in entrepreneurship.

In relation to each of the preceding hypotheses, it is important to recognize that the ratio of unemployment benefit to wages—the replacement ratio—is only a partial indicator of the generosity of the unemployment benefit system. Other relevant considerations include the length of time for which benefits can be claimed and the strictness of the criteria that must be satisfied in order for claimants to be eligible to receive payments. In recognition of this, the dataset compiled by Botero et al. includes a measure of the replacement ratio, which is then combined with indicators of the strictness of the eligibility criteria for entitlement to benefits to form an overall index of the generosity of the unemployment benefit system in an economy.¹⁶ In the empirical analysis below, we experiment with including the replacement ratio and the overall index of benefit generosity as alternative measures of the impact of the unemployment benefit system on the incentives for entrepreneurship.

As further indicators of the generosity of the system of social protection in an economy, we include the measures compiled by Botero et al. of the generosity of sickness and old age benefits.¹⁷ While employers will often provide their employees with insurance against the effects of ill-health—at least for short periods of illness—by continuing to pay them during periods of sickness absence, for self-employed workers, losses of income during periods of sickness can be a major source of risk. While private sector sources of ill-health insurance may be available, problems of moral hazard and adverse selection may mean that this is prohibitively expensive. In such circumstances, access to a generous system of publicly provided sickness benefits may be important in helping to address this particular element of the risks associated with entrepreneurship.

16. Botero et al., *supra* note 8.

17. *Id.*

The provision of welfare benefits for the elderly is a means through which society insures individuals against the risk of low income in old age. It is argued by Sinn that by affording individuals with a degree of protection against the risk of variations in their lifetime incomes the provision of this type of social insurance mechanism might increase the willingness of individuals to engage in risk taking activities.¹⁸ The intuition for this argument is that individuals will seek to translate some of the benefit from a reduction in risk into a higher expected lifetime income by taking additional risks. In view of this argument it is hypothesized that we might expect to observe a positive relationship between the generosity of the system of welfare benefits for the elderly and the rate of self-employment and nascent entrepreneurship in an economy.

In the case of both sickness and old age benefits, a key component in the generosity of the benefit system is the extent to which the level of benefit payments is conditional on contributions made by the individual. In each case, the indices compiled by Botero et al. take account both of the months of contributions or employment required to qualify for the relevant benefit in each of the countries covered and the percentage of the worker's monthly salary deducted by law for benefit contributions. In addition, in the case of sickness benefit, the measure takes account of the waiting period before benefits are paid and the percentage of net salary covered by net sickness cash benefit for a two-month spell of illness. For old age benefits, the measure takes account of the difference between the official retirement age and life expectancy at birth and the percentage of the worker's net pre-retirement salary covered by the net old age pension benefit.¹⁹

As noted in the Introduction, the other main mechanism through which governments frequently seek to protect workers against the risk of fluctuations in income due to exogenous shocks is through

18. Hans-Werner Sinn, *Social Insurance Incentives and Risk Taking*, 3 INT'L TAX & PUB. FIN. 259 (1996).

19. The measures of welfare benefits compiled by Botero et al. do not take into account the possibility that the eligibility criteria and level of assistance provided to self-employed workers may differ from those for individuals in paid employment. Botero et al., *supra* note 8. In the United Kingdom, for example, self-employed workers typically pay a lower rate of contributions to the state national insurance system and in exchange receive a lower entitlement to benefits. Unfortunately, cross-national data on differences in the benefit rules governing self-employed and paid-employed workers is not widely available, which limits attempts to control for this type of effect in empirical analysis. In their analysis of a limited range of countries, Hessels et al. (this volume) find that in general differences in the value of social security benefits paid to self-employed and paid-employed workers do not have a significant effect on the level of entrepreneurial activity. Hessels et al., *supra* note 1.

regulations designed to restrict the ability of firms to dismiss their employees. For measures of the strictness of employment protection legislation, we again draw on data compiled by Botero et al.²⁰ From their dataset, we take two measures. The first is a measure of firing costs, calculated as the cost of firing 20% of the firm's workers (10% of whom are fired for redundancy, 10% without cause), who have been employed for a minimum of three years. The cost is calculated taking account of the statutory period of notice, the level of statutory severance pay, and any mandatory penalties established by law or by mandatory collective agreements. The second measure is an index of the extent of protection granted to workers against the threat of dismissal, either by law or by mandatory collective agreements. Among other things, the measure takes account of whether an employer is obliged to give notice to or seek permission from third parties prior to dismissing a worker, either due to redundancy or for other reasons.²¹

The measures of benefits and employment protection legislation compiled by Botero et al. are calculated using data for 1997.²² To avoid any potential problems of endogeneity and to gauge more accurately the effect of these variables on the incidence of entrepreneurship, we use measures of the rate of self-employment and nascent entrepreneurship for the year 2001 and 2002, respectively. In addition, as a check on the sensitivity of the results to the choice of year in which the dependent variable is measured, we re-run the regressions for the rate of self-employment using data for the year 2000. Due to missing data on one or more of the independent variables (principally, the measures of sectoral employment shares), the sample size for the regressions for the rate of self-employment is limited to 56 observations when using data for 2001 and 54 when using data for the year 2000. For analyzing the determinants of the percentage of own-account workers, we have 51 and 46 observations,

20. Botero et al., *supra* note 8.

21. For the twenty-eight member countries of the OECD, the measures of employment protection compiled by Botero et al. can be compared with the frequently used indices of employment protection legislation (EPL) compiled by the OECD. Botero et al., *supra* note 8. Unsurprisingly perhaps, comparisons between the Botero et al. measures and values of the OECD indices for 1998 (as reported in OECD, 2004) show a positive correlation. However, this correlation is not as strong as might be expected. For instance, the correlation coefficient between Botero et al.'s measure of firing costs ("Firecost") and the OECD's overall index of the strictness of EPL is 0.43, while the correlation between Botero et al.'s measure of the protection against dismissal ("Dismiss") and the OECD index of the strictness of EPL is 0.61. The correlation coefficient between Firecost and the comparable OECD index of the strictness of regulations governing collective dismissals for 1998 is 0.22, while the correlation between Dismiss and the OECD index of regulations covering individual dismissals is 0.58.

22. Botero et al., *supra* note 8.

respectively.²³ The relatively small number of observations in each case means that care needs to be exercised when interpreting the results reported in the next section, though the hope is that by analyzing data for a number of different measures of entrepreneurship a reasonably consistent pattern of evidence on the relationships of interest may emerge.

III. RESULTS

Table 3 presents the regression results for equations with the total rate of self-employment in 2001 as the dependent variable. This measure includes both own-account workers and self-employed individuals who employ others. The equations are estimated by OLS, with t-ratios based on White heteroscedasticity-consistent standard errors given in parenthesis. The first column presents the results for a “baseline” specification, which excludes measures of social protection but which includes as explanatory variables the log of per capita GNP in 1997; the share of agriculture and services, respectively, in total employment; average years of schooling among members of the population aged over twenty-five; and as a measure of regulations governing business start-ups the natural log of the number of procedures a start-up business has to comply with in order to obtain legal status. The data for the employment shares of agriculture and services relate to 1999 and come from the ILO Key Indicators of the Labour Market, made available online through Economic and Social Data Service (ESDS) International. The data on years of schooling and the numbers of procedures required to start a business are taken from Botero et al.,²⁴ though in the case of the former the original source is Barro and Lee,²⁵ while for the latter the data come originally from Djankov et al.²⁶ The years of schooling data are the average of figures for 1995 and 2000, while the data on the number of procedures required to start a business relate to the position in 1999.

23. A list of countries included in each set of observations is given in an appendix.

24. Botero et al., *supra* note 8.

25. Robert J. Barro & Jong-Wha Lee, *International Data on Educational Attainment: Updates and Implications*, (Center for Int'l Dev. at Harvard University, Working Paper No. 42, 2000), available at <http://www.cid.harvard.edu/ciddata/ciddata.html>.

26. Simeon Djankov et al., *The Regulation of Entry*, 117 Q. J. ECON. 1 (2002).

Table 3
Regression Results for Total Self-Employment, 2001

The dependent variable is the rate of total self-employment as a percentage of all persons in employment.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>ln GNP per capita</i>	-3.127** (2.26)	-2.916** (2.08)	-3.451** (2.58)	-4.307*** (3.33)	-3.514** (2.58)	-5.531** (2.21)
% Agriculture	0.372** (2.02)	0.306 (1.61)	0.269 (1.42)	0.201 (1.03)	0.312* (1.80)	0.200 (1.22)
% Services	0.429*** (2.29)	0.351* (1.79)	0.383* (1.98)	0.336* (1.80)	0.417** (2.29)	0.247 (1.43)
Years of schooling	-1.224** (2.29)	-1.056* (1.90)	-0.829 (1.42)	-0.783 (1.38)	-0.659 (1.14)	-0.135 (0.25)
<i>ln Procedures to start a business</i>	4.303** (2.05)	4.480** (2.13)	4.673** (2.27)	5.649** (2.63)	4.755** (2.36)	4.726** (2.61)
Replacement ratio		-4.591* (1.73)				
Unemployment benefits index			-7.989** (2.12)	-7.118* (1.73)	-7.466* (1.88)	-4.799 (1.26)
Sickness benefits				-1.684 (0.34)		
Old age benefits				18.013* (1.70)		
Firing costs					6.649 (1.39)	
Dismissal procedures					-4.811 (1.37)	
Former command economy						-7.356*** (2.93)
Constant	18.611 (0.79)	22.208 (0.93)	26.778 (1.16)	25.161 (1.13)	21.710 (0.99)	46.790** (2.21)
Adjusted R ²	0.603	0.605	0.676	0.647	0.639	0.679
SSE	2463.926	2397.968	2206.866	2057.115	2104.726	1909.050
Normality	3.23	3.67	0.64	0.88	1.56	1.40

Number of observations = 56.

Notes: The coefficients are estimated by Ordinary Least Squares, with absolute t-ratios based on White heteroscedasticity-consistent standard errors shown in parenthesis below. Asterisks denote that a coefficient is significant at the 10% (*), 5% (**), or 1% (***) significance level on a two-tail test. SSE denotes the equation sum of squared residuals. Normality is the Jarque-Bera test of normality in the regression disturbances. It has an asymptotic χ^2 distribution with two degrees of freedom. See text for variable definitions and data sources.

As might be expected, the results show that other things equal the rate of self-employment is higher in countries with a relatively low

level of GNP per capita and relatively high shares of employment in agriculture and services.²⁷ Increases in the average years of schooling among members of the adult population appear to have a negative effect on the rate of self-employment, other things equal, suggesting that the returns to formal education are higher in the waged sector than in self-employment—a result that is consistent with some of the microeconomic evidence on the effect of formal education on the propensity for entrepreneurship. Finally, increases in the number of procedures required to start a business seem to have a positive effect on the rate of self-employment, other things equal. As the measure constructed by Djankov et al. relates to the number of procedures faced by reasonably large sized businesses, a possible explanation for the latter finding might be that this variable is acting as a proxy for the presence of more general regulatory barriers to the growth of small firms.²⁸ Thus, while entrepreneurs in economies in which there are a relatively large number of entry regulations for larger firms might find it relatively easy to set up in self-employment, there may be barriers that inhibit them from expanding the size of their business.

In the second and third columns, we introduce measures of the generosity of the system of unemployment benefits in an economy. Column (2) includes the replacement ratio as an explanatory variable, which is the benefit measure that has been used in a number of previous studies using OECD data. The coefficient on this variable is negative and statistically significant at the 10% level (on a two-tail test), indicating that, other things equal, a more generous system of unemployment benefit tends to discourage workers from taking on the risks associated with entrepreneurship. Stronger evidence in support of this hypothesis is provided in column (3), in which the replacement rate is replaced by the overall index of the generosity of the unemployment benefit system compiled by Botero et al.²⁹ Like their measures of the generosity of sickness and old age benefits, the latter takes account of additional factors such as the regulations governing the contributions that workers are required to make in

27. We experimented with a quadratic specification for the effect of per capita GNP on the rate of self-employment but this produced a weaker fit to the data than the semi-log specification shown. In addition we experimented with equations in which the dependent variable was specified in logarithmic form but this often resulted in equations with non-normally distributed errors.

28. Djankov et al. construct their measures of the regulations governing business start-ups for a standardized firm, that, among other things, has the property that it is a limited liability company, which one month after the commencement of operations has between five and fifty employees. Clearly, this is a significantly larger organization than the typical self-employed business. Djankov et al., *supra* note 26.

29. See Botero et al., *supra* note 8.

order to be entitled to benefits and the waiting period before benefits can be claimed.³⁰

In column (4) of the table, the indices of sickness and old age benefits are added to the list of explanatory variables. The former turns out to be statistically insignificant but the latter has a positive coefficient that is just significant at the 10% level. This finding suggests, therefore, that a more generous system of income support for workers in old age might have the effect of encouraging entry into self-employment for workers earlier in their working lives. This supports the suggestion made earlier—based on the argument of Sinn³¹—that by providing individuals with a degree of insurance against risks to their lifetime income a generous system of old age benefits might increase the willingness of individuals to engage in entrepreneurial activity.

In contrast to the above, the results in column (5) indicate that measures of the strictness of employment protection legislation have no statistically significant effect on the rate of self-employment in an economy. These results therefore further contradict the initial findings of Grubb and Wells³² and OECD on this issue.³³

Column (6) introduces the dummy variable for whether a country is a former command economy. The coefficient of this variable is negative and strongly significant and an effect of its inclusion is to impact severely on the significance of the indicator of the generosity of the unemployment benefit system and the coefficients of a number of the other explanatory variables in the model. The size of the coefficient on the dummy for former command economies indicates that, other things equal, the experience of being or having been governed by a communist regime reduces the rate of self-employment in an economy by an average of over seven percentage points. For the transition economies of Eastern Europe and elsewhere—which by 2001 had formally abandoned communism for the best part of a decade or more—the size of this effect highlights the long-lasting impact created by a system of central planning and a political culture that was strongly biased against entrepreneurship.

Table 4 repeats the regression analysis reported above but this time using the percentage of own account workers as a share of total employment (in 2001) as the dependent variable. On the whole, the

30. *Id.*

31. Sinn, *supra* note 18.

32. Grubb & Wells, *supra* note 6.

33. OECD, 1992, *supra* note 6; OECD, 1999, *supra* note 6.

results are similar to those from the previous analysis, as might be expected. However, there are some key differences, which are highlighted below. As in the analysis of total self-employment, there is fairly strong evidence that the percentage of own-account workers as a share of total employment is negatively related to the level of per capita GNP in an economy. There is consistent evidence too that the percentage of own-account workers is positively related to the share of employment in services and the number of legal procedures required in order to start a business. In relation to the main issues of interest in the current study, there is evidence once again that the generosity of the system of unemployment benefit has a negative effect on the rate of self-employment, with the effect again being more strongly determined when the overall index of the generosity of the benefit system is included as an explanatory variable rather than the replacement ratio.

Table 4
Regression Results for Own-account Workers, 2001

The dependent variable is the number of own-account workers as a percentage of all persons in employment.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>ln GNP per capita</i>	-2.909**	-2.735*	-3.316**	-3.874**	-3.052**	-4.602**
	(2.05)	(1.86)	(2.52)	(2.69)	(2.15)	(2.64)
% Agriculture	0.491**	0.432**	0.377*	0.327	0.416**	0.338*
	(2.37)	(2.07)	(1.83)	(1.45)	(2.23)	(1.74)
% Services	0.580***	0.508**	0.527**	0.484**	0.566***	0.446**
	(2.75)	(2.33)	(2.45)	(2.20)	(2.82)	(2.11)
Years of schooling	-1.346**	-1.188*	-0.859	-0.810	-0.795	-0.351
	(2.02)	(1.71)	(1.19)	(1.11)	(1.07)	(0.52)
<i>ln Procedures to start a business</i>	4.988**	5.101**	5.341**	6.217**	5.310**	5.287**
	(2.31)	(2.34)	(2.38)	(2.51)	(2.50)	(2.52)
Replacement ratio		-4.01				
		(1.33)				
Unemployment benefits index			-8.852**	-7.580	-8.800*	-6.709
			(2.18)	(1.68)	(1.97)	(1.42)
Sickness benefits				-3.869		
				(0.78)		
Old age benefits				12.560		
				(0.904)		
Firing costs					8.844	
					(1.68)	
Dismissal procedures					-3.119	
					(0.73)	
Former command economy						-4.927
						(1.43)
Constant	0.833	4.268	10.175	10.220	1.609	22.915
	(0.03)	(0.16)	(0.41)	(0.41)	(0.07)	(0.84)
Adjusted R ²	0.567	0.565	0.610	0.607	0.610	0.623
SSE	2645.460	2600.207	2332.188	2241.088	2224.312	2200.476
Normality	1.75	1.79	0.97	1.55	1.09	0.87

Number of observations = 51.

Notes: The coefficients are estimated by Ordinary Least Squares, with absolute t-ratios based on White heteroscedasticity-consistent standard errors shown in parenthesis below. Asterisks denote that a coefficient is significant at the 10% (*), 5% (**), or 1% (***) significance level on a two-tail test. SSE denotes the equation sum of squared residuals. Normality is the Jarque-Bera test of normality in the regression disturbances. It has an asymptotic χ^2 distribution with two degrees of freedom. See text for variable definitions and data sources.

Two key differences with the previous set of results are that the index of the generosity of old age benefits and the dummy variable for

the former command economies fail to achieve significance in the regression equation for own-account workers. The latter finding suggests that the legacy effect of a communist political culture is stronger for larger self-employment businesses than it is for micro-businesses in which there are no employees. The inclusion of the dummy for the former command economies, however, once again impacts on the significance of the index of unemployment benefits, suggesting that there may be a close correlation between these two variables, with benefit systems being more generous, on average, in the countries that previously were under communist rule.³⁴

In view of the relatively small number of observations and to check whether the results from the preceding analysis may be sensitive to the choice of year in which the data on the dependent variable is measured, Table 5 presents selected results from regression equations estimated using data for the year 2000. The first three columns present results for equations with the rate of total self-employment as a percentage of all individuals in employment as the dependent variable, while the remaining three columns show the equivalent specifications with the percentage of own-account workers as the dependent variable. The first and fourth columns repeat the specification from column (3) of Tables 3 and 4. The results are broadly consistent with those estimated previously, though this time the variable, *years of schooling*, is found to have a statistically significant negative effect on the incidence of entrepreneurship. The main finding is that the incidence of entrepreneurship again appears to be negatively related to the index of the generosity of the unemployment benefit system in an economy. Once again, however, this result appears to be sensitive to the inclusion of the dummy variable for former command economies. Indeed, the impact on the significance of the unemployment benefits variable appears to be much more severe in this case than in the regressions estimated using data for 2001. A note of caution with respect to the interpretation of these results, however, is that the introduction of the dummy for former command economies introduces evidence of severe non-normality in the disturbances of the equations for the percentage of own-account workers, meaning that, strictly speaking, no valid

34. An inspection of the data provides some support for this view. For the sample of fifty-six countries used in our analysis of the determinants of the rate of self-employment in 2001 the average value of the index of unemployment benefits is 0.7147 in the former command economies compared with an average of 0.5768 for the other countries in the data sample. However, the difference between the two values is just short of statistical significance at conventional levels of significance ($t = 1.61$).

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inferences can be drawn from the t-ratios of the coefficients of the affected equations.

Table 5
Regression Results on Data for 2000

	Total S.E.	Total S.E.	Total S.E.	Own- Account Workers	Own- Account Workers	Own- Account Workers
<i>In GNP per capita</i>	-2.021 (1.52)	-4.707*** (3.72)	-4.656*** (3.66)	-3.474*** (2.79)	-5.700*** (3.76)	-5.386*** (3.14)
% Agriculture	0.392* (1.81)	0.249 (1.54)	0.327** (2.16)	0.367* (1.76)	0.283* (1.83)	0.341** (2.38)
% Services	0.505** (2.27)	0.248 (1.49)	0.285* (1.93)	0.479** (2.20)	0.303* (1.76)	0.334* (2.00)
Years of schooling	-1.812*** (3.02)	-0.801 (1.44)	-0.724 (1.44)	-1.426* (1.88)	-0.386 (0.62)	-0.488 (0.80)
<i>In Procedures to start a business</i>	3.895* (1.74)	3.797** (2.10)	4.241** (2.58)	3.771 (1.60)	3.742* (1.84)	4.073** (2.31)
<i>Unemployment benefits index</i>	-8.088* (1.98)	-2.822 (0.80)	-1.053 (0.29)	-8.435* (1.84)	-4.799 (0.93)	-3.596 (0.63)
<i>Firing costs</i>			3.309 (0.78)			5.485 (1.07)
<i>Dismissal procedures</i>			-7.886*** (3.15)			-6.786** (2.41)
<i>Former command economy</i>		-11.20*** (4.21)	-10.08*** (4.01)		-8.993*** (2.87)	-7.773** (2.36)
Constant	14.86 (0.57)	47.33** (2.16)	42.19** (2.02)	22.52 (0.89)	45.61* (1.87)	39.17 (1.48)
Adjusted R ²	0.686	0.776	0.797	0.698	0.755	0.766
SSE	1957.620	1366.638	1188.847	1723.429	1360.919	1234.432
Normality	0.59	1.09	1.25	1.72	16.87***	30.08***
Number of observations	54	54	54	46	46	46

The dependent variable in the first three columns is the rate of total self-employment as a percentage of all individuals in employment. In the remaining columns the dependent variable is the percentage of own-account workers in total employment. Both variables are dated at the year 2000.

Notes: The coefficients are estimated by Ordinary Least Squares, with absolute t-ratios based on White heteroscedasticity-consistent standard errors shown in parenthesis below. Asterisks denote that a coefficient is significant at the 10% (*), 5% (**), or 1% (***) significance level on a two-tail test. SSE denotes the equation sum of squared residuals. Normality is the Jarque-Bera test of normality in the regression disturbances. It has an asymptotic χ^2 distribution with two degrees of freedom. See text for variable definitions and data sources.

A final point of note from the set of equations reported in Table 5 is that the index of the extent of protection given to workers against the threat of dismissal emerges with a negative and strongly significant coefficient—at least in the equation for the rate of total self-employment, for which inference is most valid. This result is in sharp contrast to the estimates obtained earlier using data for 2001. It suggests the possibility that strict employment protection legislation

might discourage individuals from taking up self-employment, in contrast to the suggestion made by Grubb and Wells³⁵ and OECD³⁶ that such legislation might have the effect of promoting self-employment by encouraging firms to make greater use of outside contractors. Parker derives a theoretical model that shows that, other things equal, the rate of self-employment will tend to be lower the greater the risk associated with income in self-employment relative to the risk of earnings in paid employment.³⁷ If stricter employment protection legislation has the effect of reducing the risk of earnings in paid-employment relative to the risk of self-employment incomes this could explain the findings obtained here. One should be careful of reading too much into this result, however, as it has been shown not to hold in data for 2001. Nevertheless, the finding suggests that further research on this issue might be useful.³⁸

A. *Nascent Entrepreneurship*

We turn next to consider the results for our third measure of entrepreneurship in an economy, the rate of nascent entrepreneurship—defined as the number of people actively attempting to start a business as a percentage of the adult population. As noted above, this measure provides us with an estimate of the rate of inflow into entrepreneurship and may therefore be interpreted as an indicator of the dynamics of entrepreneurship in an economy.

We begin, as before, with a baseline specification that excludes the various measures of social protection considered in the previous analysis (column (1) of Table 6).³⁹ In this case, however, the details of the baseline specification differ in two key respects from those estimated in our earlier investigation of the determinants of cross-

35. Grubb & Wells, *supra* note 6.

36. OECD, 1992, *supra* note 6; OECD, 1999, *supra* note 6.

37. Simon C. Parker, *The Effects of Risk on Self-Employment*, 9 SMALL BUS. ECON. 515 (1997).

38. Recent research by van Stel et al. (this volume) highlights a distinction between “opportunity” and “necessity” entrepreneurship in this context, where the former refers to individuals who enter entrepreneurship in response to a perceived business opportunity while the latter view business entry as a last resort. Van Stel et al. find evidence of a negative relationship between the rate of “opportunity” nascent entrepreneurship and an index of the rigidity of employment in an economy, where higher values of the latter reflect increasing restrictions on hiring and firing decisions. In contrast, they find evidence of a positive relationship between the cost of dismissing a redundant employee and the rate of “necessity” nascent entrepreneurship.

39. Note that France and India are excluded from the data sample used for the regression analysis due to missing observations on some of the explanatory variables. This leaves us with thirty-four observations.

national variations in the rate of self-employment. First, we follow Wennekers et al. by estimating a quadratic specification of the relationship between the level of per capita GNP and the rate of nascent entrepreneurship in an economy.⁴⁰ The signs of the coefficients on the two terms in per capita GNP indicate a U-shaped relationship between per capita GNP and the rate of nascent entrepreneurship, in keeping with the findings of Wennekers et al., though the coefficient on the quadratic term itself is not statistically significant.⁴¹ Second, we include the dummy for former command economies in the baseline specification. As in Wennekers et al. and in our earlier examination of the determinants of the rate of self-employment, this variable is found to have a strongly significant negative effect on the rate of nascent entrepreneurship in an economy.⁴² Among the remaining explanatory variables, both the percentage of workers employed in agriculture and the percentage employed in services are found to have a positive and statistically significant effect. However, in contrast to the findings for the rate of self-employment, neither the average years of schooling nor the log of the number of procedures required to start a business is found to have a statistically significant effect on the rate of nascent entrepreneurship. The latter finding, which is consistent with the results of Wennekers et al., is perhaps rather surprising as it implies that increases in the height of regulatory barriers to entrepreneurial entry do not, in themselves, act as a significant impediment to the rate of new business formation in an economy, a result that is counter to much current policy thinking on this issue.⁴³

40. See Sander Wennekers et al., *Nascent Entrepreneurship and the Level of Economic Development*, 24 *SMALL BUS. ECON.* 293 (2005).

41. The contrast here with the findings of Wennekers et al. might be due to the omission of observations for India and France. Alternatively, it might reflect differences in the specification of some of the other explanatory variables included in the regression analysis. *Id.*

42. *Id.*

43. *Id.* Van Stel et al. (this volume) find evidence of a positive relationship between the number of procedures a start-up business has to comply with in order to obtain legal status and the rate of “necessity” nascent entrepreneurship in an economy. In contrast, rates of “opportunity” nascent entrepreneurship and actual new business formation are found to be unrelated to the number of procedures required to start up in business. The authors argue that many necessity entrepreneurs in developing countries may be able to avoid the burden of formal regulations by setting up businesses in the informal sector. Hessels et al., *supra* note 1.

Table 6
Regression Results for the Rate of Nascent Entrepreneurship, 2002

The dependent variable is the number of people who report that they are actively engaged in starting a business as a percentage of the adult population.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>GNP per capita</i> ($\times 10^3$)	-0.254	-0.290*	-0.284*	-0.192	-0.268*	
	(1.67)	(1.76)	(1.90)	(1.24)	(1.84)	
$[GNP per capita]^2$	3.42×10^{-9}	4.24×10^{-9}	4.03×10^{-9}	2.31×10^{-9}	3.55×10^{-9}	
	(1.20)	(1.30)	(1.41)	(0.79)	(1.28)	
<i>ln GNP per capita</i>						-1.622* (2.01)
% Agriculture	0.235*** (3.90)	0.196** (2.71)	0.180** (2.77)	0.182** (2.68)	0.190*** (2.90)	0.183*** (3.37)
% Services	0.156*** (2.87)	0.130* (1.99)	0.124* (1.91)	0.108* (1.83)	0.122* (1.75)	0.141** (2.37)
Years of schooling	0.164 (0.54)	0.207 (0.70)	0.260 (0.88)	0.255 (0.89)	0.262 (0.94)	0.223 (0.76)
<i>ln Procedures to start a business</i>	-0.726 (0.92)	-0.769 (0.96)	-0.789 (1.00)	-1.005 (1.12)	-0.608 (0.76)	-0.558 (0.76)
Replacement ratio		-1.373 (0.96)				
Unemployment benefits index			-2.625** (2.18)	-2.824* (1.85)	-2.430* (1.98)	-2.501* (1.84)
Sickness benefits				3.475 (1.15)		
Old age benefits				-3.875 (1.00)		
Firing costs					-1.366 (0.65)	
Dismissal procedures					-0.412 (0.30)	
Former command economy	-2.940*** (3.36)	-2.835*** (3.18)	-2.600** (2.76)	-2.946*** (2.99)	-2.719*** (3.01)	-2.644** (2.54)
Constant	-3.991 (0.68)	-1.386 (0.21)	-0.076 (0.01)	0.425 (0.06)	0.110 (0.02)	10.71 (1.47)
Adjusted R^2	0.530	0.528	0.556	0.551	0.534	0.532
SSE	88.93832	85.93500	80.71772	74.99302	77.93577	88.468
Normality	1.58	1.40	1.66	2.07	1.95	1.79

Number of observations = 34.

Notes: The coefficients are estimated by Ordinary Least Squares, with absolute t-ratios based on White heteroscedasticity-consistent standard errors shown in parenthesis below. Asterisks denote that a coefficient is significant at the 10% (*), 5% (**), or 1% (***) significance level on a two-tail test. SSE denotes the equation sum of squared residuals. Normality is the Jarque-Bera test of normality in the regression disturbances. It has an asymptotic χ^2 distribution with two degrees of freedom. See text for variable definitions and data sources.

Column (2) of the Table introduces the first of our measures of social protection, which is the unemployment benefit replacement ratio. The coefficient for this variable takes on a negative sign, consistent with the results for the rate of self-employment. However, it is a long way from statistical significance. In contrast, Botero et al.'s overall index of the generosity of the unemployment benefit system has a statistically significant negative coefficient, emphasizing that the detrimental effect of the benefit system on the incentives for entrepreneurship depends not only on the size of benefit payments available to the unemployed but also the eligibility criteria for the receipt of benefits and the waiting time before benefits can be claimed.⁴⁴ The coefficient for the index of unemployment benefits retains its significance when the remaining indicators of the extent of social protection—the indices of the generosity of sickness and old age benefits and the measures of firing costs and the restrictions on dismissals—are added to the regression, while these variables themselves are found to have statistically insignificant effects.⁴⁵

Finally, in column (6) of the Table, we examine the effect of replacing the quadratic specification for the effect of GNP per capita with the natural logarithm of this variable. A comparison of the results from column (6) with those in column (3) shows that overall there is little to choose between the two specifications, however, the quadratic specification offers a slightly better fit to the data.

In summary, the results from the analysis of the determinants of the rate of nascent entrepreneurship provide further support for the notion that the social support mechanisms created to protect individuals against fluctuations in income resulting from shocks to the economy reduce the incentives that individuals have to engage in entrepreneurship. In particular, the provision of a generous system of unemployment benefits is associated with a relatively low rate of new business formation among members of the adult population in an economy. In addition, the results from this analysis provide confirmation that the political culture created by a history of

44. Botero et al., *supra* note 8.

45. Hessels et al. (this volume) similarly find a statistically insignificant effect of sickness benefits on the rate of nascent entrepreneurship. However, for a limited sample of fifteen countries, they find evidence of a significant negative relationship between the level of sickness benefits (relative to earnings) and the rate of total early-stage entrepreneurial activity (from GEM). Hessels et al., *supra* note 1.

communist rule and the strictures of a command economy results in an environment that is detrimental to entrepreneurship.⁴⁶

IV. SUMMARY AND CONCLUSIONS

In this paper we have reviewed the theoretical arguments and empirical evidence concerning the effects of mechanisms designed to protect individuals from the risk of fluctuations in income due to economic shocks on the incentives for entrepreneurship in an economy. We have seen that, in general, theoretical analysis produces ambiguous predictions concerning the effect that such mechanisms might be expected to have on the incidence of entrepreneurship, while the results of empirical studies are not fully conclusive. In reviewing the empirical evidence, we noted that previous studies based on cross-national data have been confined to use of data from OECD countries. In this paper, therefore, we have sought to extend the analysis of the relationship between social protection systems and the rate of entrepreneurship to embrace a wider range of countries, including a number of less developed economies, the transition economies of the former Soviet Union and Eastern Europe, and China. The main source of data for this analysis has been a set of indicators of the extent of social protection mechanisms in a range of economies from the dataset compiled by Botero et al.⁴⁷

In our analysis, we have found evidence that the rate of entrepreneurship in an economy—as proxied by the rate of self-employment (including own-account workers and individuals who employ others) and the rate of nascent entrepreneurship—is negatively related to an index of the generosity of the unemployment benefit system. The value of this index reflects not only the value of the benefit payments received by unemployed workers (relative to earnings) but also the strictness of the eligibility criteria for the receipt of benefits and the waiting time before benefits can be claimed. This

46. For each of our measures of entrepreneurship, we have experimented with alternative specifications in which the dummy variable for former command economies was replaced with a measure of the presence of left of center parties in government (from Botero et al.). Botero et al., *supra* note 8. Left of centre governments may be more likely to introduce policies that limit the rewards for risk taking and diminish the incentives for entrepreneurship. This alternative measure of the influence of political culture usually takes on a significantly negative coefficient in the regressions (though it tends to be insignificant in the equations for nascent entrepreneurship) and overall the results are not very different from those with the dummy for former command economies as an explanatory variable. However, the fit of the equations is generally not quite as good as those in which the latter variable is included. The results are available from the author, on request.

47. Botero et al., *supra* note 8.

index is shown to be a better predictor of the rate of entrepreneurship in an economy than the benefit replacement ratio alone. However, the strength of the evidence on the effect of unemployment benefits on the rate of self-employment in an economy is shown to be sensitive to the choice of year in which the dependent variable is measured.⁴⁸

There is some evidence that the rate of self-employment—both total self-employment and those who work solely on their own-account—may be negatively related to the strictness of regulations governing the protection of workers from the threat of dismissal. This evidence is consistent with the notion that stricter employment protection legislation reduces the risk of incomes in paid employment relative to the risk of income from self-employment and so reduces the attractiveness of the latter state relative to the former. However, the evidence is significant only for data on the dependent variable from the year 2000 and is insignificant in data for the year 2001. Moreover, there is no evidence of a significant effect of employment protection regulation on the rate of nascent entrepreneurship.

The strongest evidence to emerge from the study concerns the influence of political culture on the incidence of entrepreneurship. Countries that have a history of communist rule appear to have a lower rate of entrepreneurship—whether measured by the incidence of self-employment or by the rate of nascent entrepreneurship—other things equal, than countries with more market oriented economies. It is interesting to reflect further on the reasons for this finding and the possible implications for the future development of entrepreneurship in the countries concerned. Under communist rule, the former centrally planned economies were dominated by the presence of large firms. Small and medium-sized enterprises, which in market economies often provide the seedbed for the emergence of new entrepreneurial talent, were almost non-existent.⁴⁹ Following the

48. Closer examination of the data provides little insight into the reasons for this. For the fifty-one countries for which we have observations on the total rate of self-employment in both 2000 and 2001 the correlation between the values of the observations for the two years is 0.93, while for each year the raw correlation between the total rate of self-employment and the index of the generosity of unemployment benefits is similar (-0.56 in 2000 and -0.54 in 2001). Among the countries for which data on the total self-employment rate is available only for one of the years in question there are no particularly obvious outliers; though in each case we observe a country in which a high rate of self-employment is coupled with a particularly low value for the index of unemployment benefits (Bolivia in 2000; Kazakhstan in 2001).

49. John S. Earle & Zuzana Sakova, *Business Start-ups or Disguised Unemployment? Evidence on the Character of Self-Employment from Transition Economies*, 7 LAB. ECON. 575 (2000); John McMillan & Christopher Woodruff, *The Central Role of Entrepreneurs in Transition Economies*, 16 J. ECON. PERSP. 153 (2002). For evidence on the seedbed role of small firms for entrepreneurship in market economies see, for example, P.S. Johnson & D.G. Cathcart, *The Founders of New Manufacturing Firms: A Note on the Size of their "Incubator" Plants*, 28 J.

collapse of communism, while governments in the transition economies have proceeded at varying speeds down the transition path toward a fully-fledged market economy—liberalizing markets and freeing up bureaucratic restraints on the ability of individuals to set up in business—impediments to the emergence of entrepreneurship have often remained. Expropriation of profits through official corruption, competition from newly privatized former state-owned enterprises, and a lack of access to credit facilities have been among the problems with which entrepreneurs and potential entrepreneurs in the transition economies have often had to contend. However, even where these particular problems have been absent or their prevalence reduced a key remaining problem concerns the low levels of entrepreneurial human capital that have been engendered by decades of existence under a central planning system that tended to blunt individual incentives and that was founded, in principle at least, on the notion of “each according to his needs.” The effects of this cultural legacy may take rather longer to overcome. In light of the growing evidence highlighting the importance of entrepreneurship to the promotion of employment and wealth creation there is a clear imperative for the policy-making authorities in the transition economies to find a means of addressing the low rates of entrepreneurship prevalent in their economies, in particular through measures to promote investment in the accumulation of entrepreneurial human capital and foster a cultural and institutional climate that is more favorable to entrepreneurship.

APPENDIXList of Countries Included in the Data Sample for Each of the
Dependent Variables

<i>Country</i>	<i>SE 2001</i>	<i>SE 2000</i>	<i>OW N 2001</i>	<i>OWN 2000</i>	<i>NER 2002</i>
Argentina	•	•	•	•	•
Armenia	•		•		
Australia	•	•	•	•	•
Austria	•	•	•	•	
Belgium		•			•
Bolivia		•		•	
Brazil	•		•		•
Bulgaria			•		
Canada	•	•			•
Chile	•	•	•	•	•
China					•
Colombia	•	•	•	•	
Croatia	•	•	•	•	•
Czech Republic	•	•	•	•	
Denmark	•	•	•	•	•
Dominican Republic	•	•	•	•	
Ecuador	•	•	•	•	
Egypt, Arab Rep.	•	•	•	•	
Finland					•
Georgia	•	•	•	•	
Germany	•	•	•	•	•
Greece	•	•	•	•	
Hong Kong	•	•	•	•	•
Hungary	•	•	•	•	•
Indonesia	•	•	•	•	
Ireland	•	•	•	•	•
Israel	•	•	•	•	•
Italy	•	•	•	•	•
Jamaica	•	•	•	•	
Japan	•	•	•	•	•
Kazakhstan	•		•		
Korea	•	•	•	•	•
Kyrgyz Republic	•		•		
Latvia	•	•	•	•	
Lithuania			•	•	
Malaysia	•	•	•	•	
Mexico	•	•	•	•	•
Netherlands	•	•			•
New Zealand	•	•	•	•	•
Norway	•	•			•
Pakistan	•	•	•	•	
Panama	•	•	•	•	

Philippines	•	•	•	•	•
Poland	•	•	•	•	•
Portugal	•	•	•	•	•
Romania	•	•	•	•	•
Russian Federation	•	•	•	•	•
Singapore	•	•	•	•	•
Slovak Republic	•	•	•	•	•
Slovenia	•	•	•	•	•
South Africa	•	•	•	•	•
Spain	•	•	•	•	•
Sweden	•	•	•	•	•
Switzerland	•	•	•	•	•
Taiwan	•	•	•	•	•
Thailand	•	•	•	•	•
Turkey	•	•	•	•	•
United Kingdom	•	•	•	•	•
United States	•	•	•	•	•
Uruguay	•	•	•	•	•
Venezuela	•	•	•	•	•
Vietnam	•	•	•	•	•

Variable definitions: *SE* = Total self-employment as a percentage of employment; *OWN* = Own-account workers as a percentage of employment; *NER* = Nascent entrepreneurs as a percentage of the adult population. A • denotes that the country is included in the data sample for the dependent variable in question.