

Chapter 11

ENTREPRENEURSHIP, INDUSTRIAL RESTRUCTURING AND UNEMPLOYMENT IN PORTUGAL

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1. INTRODUCTION

In recent years, the relationship between entrepreneurship, as reflected by the business ownership (or self-employment) rate, and unemployment has received increasing attention from academics and policy-makers in European countries. Europe and other industrialized regions of the globe have experienced considerable industrial re-structuring in the last three decades, changing from traditional manufacturing industries towards new and more complex technologies such as electronics, software and biotechnology. Audretsch and Thurik (2001 and 2004) argue that the role of new firms in technological development has been enhanced by a reduced importance of scale economies and an increasing degree of uncertainty in the world economy, creating more room for innovative entry.

The present chapter examines the dynamics of the relation between variations in self-employment and unemployment rates for Portugal in the period 1974-2002. A comparison with the pattern observed for OECD countries is the starting point of our investigation. Portugal represents a particularly interesting case for examination of the dynamics of this relationship, given the specifics of the firm size distribution of the

Portuguese economy. In particular, the Portuguese industrial structure is dominated by what may be termed “micro-businesses”, *i.e.* firms with less than ten employees. Moreover, the proportion of micro-businesses in the Portuguese economy has increased during the period under analysis. This suggests that, while the Portuguese economy features high levels of business ownership coupled with a small average size of firms, new firm growth rates are likely to be low and that, therefore, the industrial re-structuring effects brought about by increases in business ownership rates probably do not have a significant impact on the reduction of unemployment.

The following sections start by looking at relevant and recent background literature concerning the dynamics driving the relation between entrepreneurship/business ownership and unemployment; we then focus on the evolution of the Portuguese economy for the period under analysis, examining specifically the business ownership and unemployment rates. This provides the necessary backdrop for the discussion of the empirical results. The empirical approach used is then outlined and results are presented, focusing particularly on the pattern of residuals that results from the application to Portuguese data of a model estimated for 23 OECD countries. Departing from the question of how well the model fits the Portuguese data, we attempt to provide explanations for the differences found between the dynamics of the relationship between variations in the self-employment and unemployment rates observed for OECD countries in general and for Portugal in particular.

2. THE RELATION BETWEEN ENTREPRENEURSHIP AND UNEMPLOYMENT

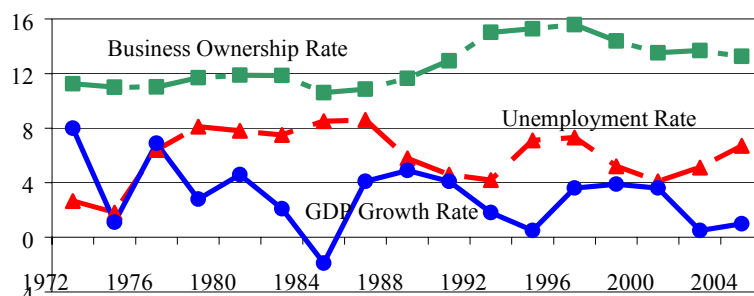
There are many views on the relationship between unemployment and entrepreneurial activity. See Audretsch, Carree, van Stel and Thurik (2005). Occupational choice theory suggests that increased unemployment will lead to an increase in start-up activity on the grounds that the opportunity cost of starting a firm has decreased.¹ However, there are counter effects. The unemployed tend to possess lower endowments of human capital and entrepreneurial talent required to start and sustain a new firm. This would suggest that high unemployment may be associated with a low degree of entrepreneurial activity. High unemployment rates may also imply lower levels of personal wealth which in turn would reduce the likelihood of becoming self-employed (Hurst and Lusardi, 2004). High levels of unemployment may correlate with stagnant economic growth leading to a low number of entrepreneurial opportunities (Audretsch, Thurik, Verheul and Wennekers, 2002).

There is also a literature claiming that start-up activity influences unemployment. New firm start-ups hire employees, resulting in subsequent decreases in unemployment.² Furthermore, increased entrepreneurial activity may impact country-wide economic performance in various ways (van Stel, Carree and Thurik, 2005). Entrepreneurs may introduce important innovations by entering markets with new products or production processes (Acs and Audretsch, 2003). Entrepreneurs may increase productivity by increasing competition.³ They may improve our knowledge of what is technically viable, what consumers prefer and how to acquire the necessary resources by introducing variations of existing products and services in the market. The resulting learning process speeds up the discovery of the dominant design for product-market combinations. The learning does not solely apply to the experimenting entrepreneur. Knowledge spillovers play an important role in this process (Audretsch and Keilbach, 2004). Lastly, they may be inclined to work longer hours and more efficiently as their income is strongly linked to their working effort. Also, their reputation and their social status is directly related to these efforts. See Carree and Thurik (2003) for a survey of the effects of entrepreneurship on economic growth.

We conclude that there are many interrelations between entrepreneurial activity and unemployment. Unraveling the relationship between entrepreneurship and unemployment is crucial, because policy is frequently based on assumptions that do not reflect the ambiguities described. Audretsch, Carree, van Stel and Thurik (2005) try to reconcile the ambiguities found in the relationship between unemployment and start-up activity. They introduce a two-equation vector auto-regression model where changes in unemployment and self-employment are linked to subsequent changes in those variables for a panel of 23 OECD countries. The present chapter reviews this empirical model and presents and interprets the residuals for Portugal.⁴

3. THE EVOLUTION OF THE PORTUGUESE ECONOMY

Figure 1 below displays the evolution of the rates of GDP growth, unemployment, and business ownership in Portugal in the period 1972-2004. To properly assess the evolution of the Portuguese economy during this period it is essential to take into consideration two major external shocks which imparted significant effects on economic growth, as well as on unemployment and business ownership rates. These shocks were i) the oil crisis of 1973, followed by the revolution of 1974 and ii) the entry into the European Union (E.U.) in 1986.



Sources: COMPENDIA Database, OECD and Bank of Portugal

FIGURE 1 - UNEMPLOYMENT, BUSINESS OWNERSHIP AND GDP GROWTH IN PORTUGAL: 1972-2004

Until 1974 Portugal was a colonial power, living under a one party regime and holding considerable portions of Africa. Since the early 1960s, Portugal had been facing colonial wars on several fronts. During the 1960-1973 period, the Portuguese economy increasingly focused on international trade with Western European partners, and less on trade with the colonies. Following the post-war growth cycle in Western Europe, Portugal experienced relatively high economic growth rates. Despite the concentration of economic power in a small number of financial and industrial conglomerates benefiting from government protection, the Portuguese business ownership rate in 1972 was relatively high when compared to the rest of Europe. Most of this self-employment was, however, based on low productivity agriculture and very small retail businesses intended only for subsistence (life style entrepreneurship). Emigration and the mobilization of armed forces shrunk the work force. Together with economic growth, this brought about very low levels of unemployment.

During 1972-1973, Portugal suffered the effects of the rise in overall industrial costs resulting from the increase in oil prices triggered by OPEC. Economic growth slowed down considerably in most OECD countries, thus reducing the demand for Portuguese goods and opportunities for Portuguese workers abroad. In April 1974, a non-violent revolution led by army officers ended the one party regime and made the African colonies independent, leading to a massive inflow of more than half a million refugees. In the period up to late 1975 most property rights were abolished and the main industries and financial services were nationalized. The stock market was virtually eliminated.

The last vestiges of such radical changes were only removed in the early 1980s, in order to pave the way for privatization and E.U. integration, which occurred in 1986. Meanwhile, Portugal underwent two structural adjustment

programs overseen by the IMF due to severe current account deficits. As a result of such an assortment of external shocks, the Portuguese economy grew at a very slow rate, experiencing periods of recession. Government intervention supporting many companies facing financial difficulties, coupled with legislation against dismissals and significant increases in public sector employment prevented the unemployment rate from rising to higher levels than those displayed in Figure 1. While high unemployment and economic instability may have made self-employment more attractive, thus contributing to a rise in business ownership, government policies protecting jobs and increasing the economic role of the public sector yielded the opposite effect, leading to a reduction in business ownership.

After Portugal joined the E.U. in 1986, the main focus of development policy became the promotion of socio-economic cohesion through the granting of funding directed at the improvement of physical and educational infra-structure, as well as providing incentives and financial help for private investment. Funding was awarded for investments in start-up firms, the expansion of incumbents, and also for investment in R&D and environmental improvements. Larger firm size was perceived as crucial to ensure competitiveness in the E.U. market. Hence a significant proportion of funding was directed at capacity increases by relatively large incumbents. While this might have restricted the size of start-ups, it did not preclude a significant increase in the business ownership rate. In fact, while large investments in infra-structure and productive capacity brought about a significant decrease in unemployment from the outset of E.U. integration, relatively small average firm size and low entry barriers in most non regulated industries also increased possibilities for self-employment.

So, while the global recession of the early 1990s caused an increase in unemployment, the business ownership rate kept growing, in part due to the de-regulation of markets brought about by privatization and E.U. rules. However, as unemployment rates started to subside in the mid-1990s, so did business ownership rates. It can be argued that, as the Portuguese economy became more integrated in the E.U. market, consolidation and “shakeout”⁵ occurred in some markets thus leading to a reduction in the business ownership rate.

4. MEASURING THE RELATION BETWEEN ENTREPRENEURIAL ACTIVITY AND UNEMPLOYMENT

In Audretsch, Carree, van Stel and Thurik (2005) it is explained why the dynamic interrelationship between entrepreneurial activity and unemployment is complex and, in particular, that the direction of causality

between the two variables is not clear *a priori*. As a response to the ambiguity inherent in the unemployment-entrepreneurship relationship, the previous sections suggest two testable hypotheses: *i*) that increases in entrepreneurial activity lead to a decrease in subsequent unemployment; *ii*) that increases in unemployment lead to an increase in subsequent entrepreneurial activity.

In order to gain insight in the causal linkages involved in the relationship, Audretsch, Carree, van Stel and Thurik (2005) estimate a vector auto-regression (VAR) model (Sims, 1980). This means that a vector of dependent variables is explained by one or more lags of the vector of dependent variables, i.e., each dependent variable is explained by one or more lags of itself and of the other dependent variables. They estimate a two equation VAR model with the change in unemployment and the change in entrepreneurial activity as dependent variables. Furthermore, they use time dummies as exogenous explanatory variables.⁶ These dummies correct for business cycle effects over the sample period that are common for the countries covered by the data set. Their model reads as follows:

$$U_{it} - U_{i,t-L} = \alpha + \sum_{j=1}^J \beta_j (E_{i,t-jL} - E_{i,t-(j+1)L}) + \sum_{j=1}^J \gamma_j (U_{i,t-jL} - U_{i,t-(j+1)L}) + \sum_{t=1}^T \delta_t D_t + \varepsilon_{1it} \quad (1)$$

$$E_{it} - E_{i,t-L} = \kappa + \sum_{j=1}^J \lambda_j (U_{i,t-jL} - U_{i,t-(j+1)L}) + \sum_{j=1}^J \mu_j (E_{i,t-jL} - E_{i,t-(j+1)L}) + \sum_{t=1}^T \nu_t D_t + \varepsilon_{2it}, \quad (2)$$

where U is unemployment, E is entrepreneurial activity, i is a country-index, L is the time span in number of years, J is the number of time lags included and D_t are time dummies. The expected sign of the joint impact of the β coefficients is negative and the expected sign of the joint impact of the λ coefficients is positive. The inclusion of lagged dependent variables on the right hand side in the VAR model allows for a test for the direction of causality.⁷

The model is tested using a data panel for 23 OECD countries between 1974 and 2002. For the unemployment data, U , standardized unemployment rates from *OECD Main Economic Indicators* are used. Entrepreneurial activity, E , is measured as self-employment and these data are taken from the COMPENDIA 2002.1 data set of EIM in Zoetermeer, The Netherlands. The COMPENDIA data set harmonizes self-employment data as published

in *OECD Labor Force Statistics* making use of various (country-specific) sources to make the self-employment data as comparable as possible across countries and over time.⁸ The definition used in COMPENDIA is the number of non-agricultural self-employed (unincorporated as well as incorporated) as a fraction of the labor force. See Figure 1 for the development of the self-employment rate in Portugal and van Stel (2005) for further details about this data base.

Equations (1) and (2) are estimated using weighted least squares. Audretsch, Carree, van Stel and Thurik (2005) consider changes in self-employment and unemployment over periods of four years, i.e., L equals 4. Furthermore, they test for different time lags, in order to gain insight in the lag structure between unemployment and entrepreneurship. Inclusion of more lags seems more compelling because the employment impact of entrepreneurship is not instantaneous. Rather it requires a number of years for the firm to grow.⁹

Using four-yearly data to avoid overlapping periods (given that $L=4$), the authors test for the shape of the lag structure and find that the model variant using two lags is statistically optimal. The results are presented in Table 1. The variables of interest are bold-printed in the upper part of the table. The control variables (i.e., the lagged dependents) are in the lower part.

Table 1 - Estimating the relation between U and E for 23 OECD Countries (115 observations)

Dependent:	$U_t - U_{t-4}$	Dependent:	$E_t - E_{t-4}$
Constant	0.674	Constant	-0.243
(in %-points)	(1.4)	(in %-points)	(1.5)
$E_{t-4} - E_{t-8}$	0.091	$U_{t-4} - U_{t-8}$	0.067 *
	(0.3)		(2.2)
$E_{t-8} - E_{t-12}$	-1.13 **	$U_{t-8} - U_{t-12}$	0.090 **
	(3.8)		(2.8)
$U_{t-4} - U_{t-8}$	-0.246 **	$E_{t-4} - E_{t-8}$	0.329 **
	(2.7)		(3.5)
$U_{t-8} - U_{t-12}$	-0.027	$E_{t-8} - E_{t-12}$	0.167
	(0.3)		(1.7)
R^2	0.403	R^2	0.385
P-value Granger causality test	0.000 **	P-value Granger causality test	0.006 **

Note: Absolute t-values are between brackets. Coefficients for year dummies are not reported.

Significant at 0.05 level. ** Significant at 0.01 level.

Source: Audretsch, Carree, van Stel and Thurik (2005)

From the left part of the table we see that entrepreneurial activity significantly lowers unemployment but that it takes a lag of eight years before the (“entrepreneurial”) effect capitalizes. Only after some time, the new entrants actually contribute to economic growth, either by growing themselves or stimulating incumbent firms to perform better because of the increased competition.

Table 1 also shows that changes in unemployment have a positive impact on subsequent self-employment. This is the “refugee” effect of unemployment stimulating start-up and self-employment rates. Note however that the “refugee” effect is considerably smaller than the “entrepreneurial effect”, i.e., the sum of the coefficients in the right (bold-printed) part of Table 1 is much smaller compared to the (absolute) sum in the left part. Finally, from the Granger statistics we conclude that both directions of causality are in order, i.e., unemployment actually causes self-employment (p-value 0.006) while self-employment also causes unemployment (p-value 0.000).

5. ANALYZING THE RESIDUALS FOR PORTUGAL

Based on the results in Table 1 we are now able to analyze the residuals for Portugal during the period 1986-2002.¹⁰ Using data for observed unemployment and business ownership rates for Portugal in the period 1974-2002, it is straightforward to calculate the estimated values of the residuals for Portugal from the coefficients estimated for equations (1) and (2): Z_{1t} for the unemployment rate – equation (1) – and Z_{2t} for the business ownership rate – equation (2):

$$Z_{1t} = U_t^O - U_t^P \quad (1a)$$

$$Z_{2t} = E_t^O - E_t^P \quad (2a)$$

where U_t^O and E_t^O are the observed unemployment and business ownership rates, while U_t^P and E_t^P are the unemployment and business ownership rates predicted by the model in equations (1) and (2), respectively. The values obtained for the residual terms tell us whether the model under-estimates (positive residual) or over-estimates (negative residual) the variations in unemployment and business ownership rates.

5.1. Unemployment Equation (1 and 1a)

The residuals, as well as the observed and predicted unemployment rates, for Portugal are displayed in Figures 2 and 3. We see that the estimated residuals appear to be unsystematic in that positive and negative values alternate. The residuals are negative – indicating an over-estimation of the unemployment rate – for the periods of 1990 and 1994; while for 1986, 1998 and 2002, the model provides lower predicted values for the

unemployment rate than those actually observed (positive residuals). The residuals are particularly large for 1990 – which registered an unemployment rate of 4.6 percent, while the model predicted 7.2 percent - and for 2002, when the observed unemployment rate was over 5 percent, while the predicted value was a little above 2 percent.

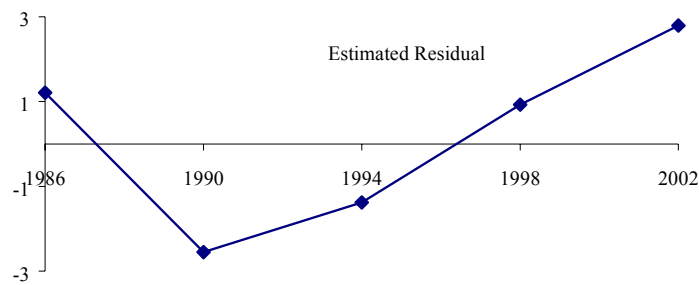


FIGURE 2: ESTIMATED RESIDUALS FOR PORTUGAL 1986-2002 IN %-POINTS (EQUATION 1A)

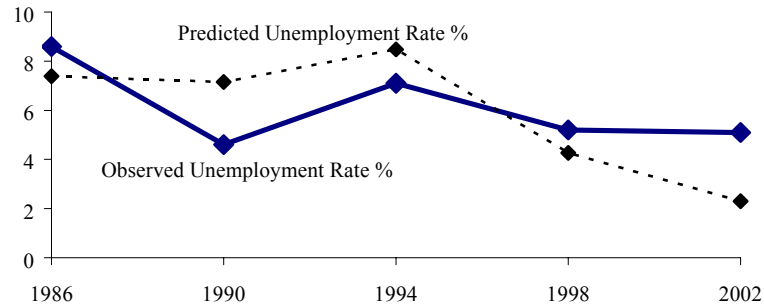


FIGURE 3: OBSERVED AND PREDICTED UNEMPLOYMENT RATES IN PORTUGAL 1986-2002

It seems likely that part of the discrepancies observed between real and predicted unemployment in Portugal could be explained by macroeconomic fluctuations that followed Portugal's entry in the EU, as will be explained below.

As it was briefly argued in the first section of this chapter, the nature of entrepreneurship and the socio-economic environment in Portugal differ from those in most other OECD countries. Figure 4 displays the average business ownership rates for the 23 OECD countries under analysis for the

1972-2004 period. While Portugal displays one of the highest average rates of business ownership, a large percentage of firms are micro-businesses, with less than 10 employees, reflecting a dominance of what may be deemed as “subsistence entrepreneurship” or, using the taxonomy made common by the Global Entrepreneurship Monitor (Acs, Arenius, Hay and Minniti, 2005), “necessity-based entrepreneurial activity.” This kind of entrepreneurial activity has remained very important in Portugal when compared with other developed countries (Acs, Arenius, Hay and Minniti, 2005).

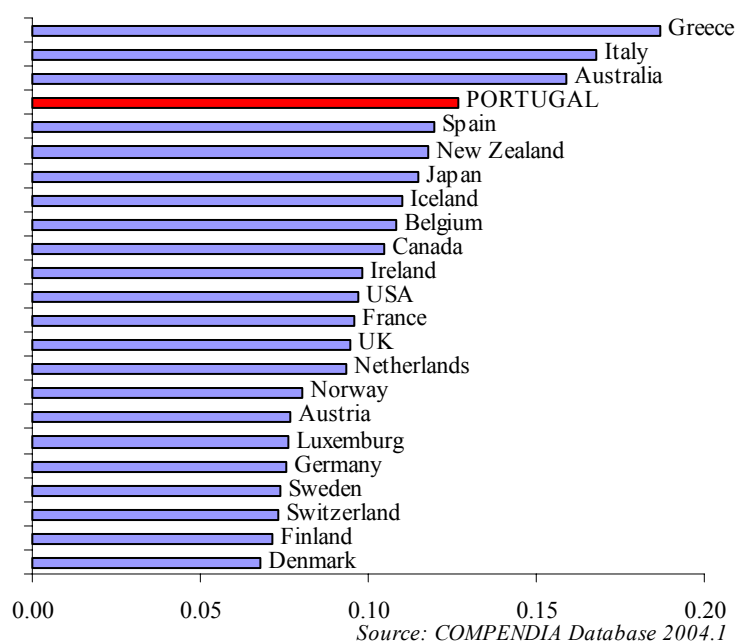


FIGURE 4: AVERAGE BUSINESS OWNERSHIP RATES FOR 23 OECD COUNTRIES – 1972-2004

Using a data source specific for Portugal – the Longitudinal Matched Employer-Employee Microdata set – LMEEM (see Escária and Madruga 2002) – based on information gathered by the Portuguese Ministry of Labor and Solidarity covering all business units with at least one wage-earner in the Portuguese economy, it is possible to shed some additional light on the nature of the size distribution of new firms in Portugal. Figures 5 and 6 display the size distribution of firms in the Portuguese economy in the 1990s and the average net entry rates per size class during the same period.

From Figures 5 and 6, it is possible to establish that, as pointed out earlier in the chapter, the proportion of micro-firms in the Portuguese economy seems to be increasing, as the larger size classes display negative entry rates. Even though the structure of economic activity in Portugal has

largely switched from agriculture to services between the 1970s and the 1990s, the persistently small average size of firms means that new firm survival and growth rates are likely to be low.¹¹ Hence, the industrial restructuring effects brought about by increases in business ownership rates probably will not have significant repercussions on the reduction of future unemployment.

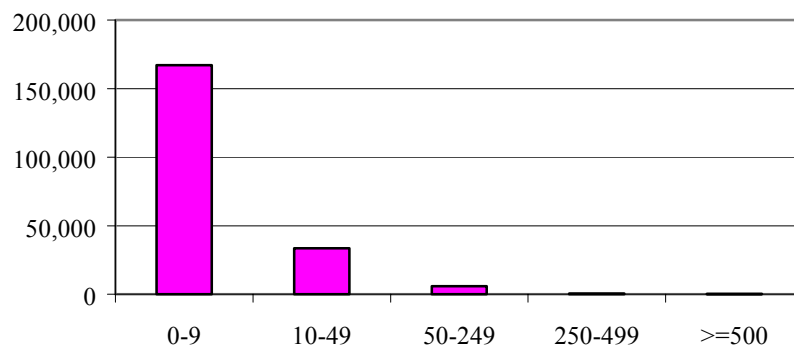


FIGURE 5 - SIZE DISTRIBUTION OF INCUMBENTS (STOCK OF FIRMS) IN THE PORTUGUESE ECONOMY (NO OF EMPLOYEES) – AVERAGE 1991-2000

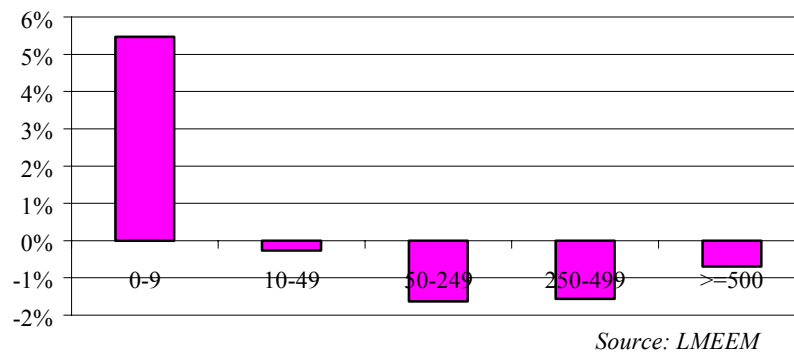


FIGURE 6: NET ENTRY RATES PER SIZE CLASS (NO OF EMPLOYEES) – AVERAGE 1991-2000

Following a methodology similar to that used by Fritsch and Mueller (2004), Baptista, Escária and Madruga (2005) examined the lag structure of the long term effects of new business formation on employment for the Portuguese regions for 1982-2002. Their results, while displaying a lag structure similar to that of Germany, showed that positive long term effects

of regional start-ups on future employment are smaller and take longer to occur in Portugal. Since the authors controlled for regional industrial structures of incumbents and new entrants, differences between countries in the magnitude of these long term effects of new business formation on employment are probably due to differences in the “quality” of entrants, which may be indicated by their potential for future growth. It is likely that the relatively high prevalence of subsistence entrepreneurship/necessity-based entrepreneurial activity in Portugal are associated with low firm growth rates, thus leading to lower effects of new business formation on employment growth. Indeed the relatively low labor productivity levels¹² in Portuguese businesses, related to the low education attainment of the working age population (IAPMEI, 2005, p. 15), are not conducive to the positive long term employment effects of new business formation as described in Section 4.

All this suggests that the model estimated in the present paper should systematically over-estimate the (negative) impact of increasing business ownership rates on unemployment, i.e., one should expect observed unemployment in Portugal to be consistently higher than predicted unemployment and so there should be a consistently positive estimated residual. Such a hypothesis, however, does not hold for 1990 and 1994. The pattern of residuals therefore suggests that other economic factors should be taken into account when explaining the model’s performance for this period.

As was pointed out earlier, the first wave of cohesion funding which followed entry into the E.U. in 1986 was mostly directed at infra-structure enhancements and production capacity increases. This has generally led to an increase in capital intensity across the Portuguese economy. Probably scale increases by incumbents and the proliferation of public works contributed significantly to foster an unemployment rate below the levels predicted by the model. The dynamics provided by E.U. funding are likely to have provided a positive effect on employment that was unrelated to developments in business ownership rates in previous periods, thus explaining why the unemployment rate in 1990 and 1994 is significantly below the model’s predictions.

This leaves only the large positive residual in 2002 to be clarified. In Section 3 it was explained that following the entry of Portugal into the E.U. in 1986, business ownership rates increased due to the de-regulation of markets brought about by privatization and E.U. rules. The increased business ownership rates after 1986 are visible in Figure 1. The results in the left panel of Table 1 imply that, with a lag of eight years, this increase should lead to a reduction in unemployment. Hence, according to the model the increase in business ownership between 1986 and 1994 should have led to a decrease in unemployment between 1994 and 2002. However, from Figure 3 we see that, although the unemployment rate decreased somewhat

between 1994 and 1998, it did not change between 1998 and 2002. Hence, the predicted negative effect on unemployment did not occur in reality. This is consistent with the result found by Baptista, Escária and Madruga (2005) that positive long term employment effects of new firms are smaller in Portugal compared to other OECD countries and take longer to occur. This suggests that, although a significant proportion of the new firm entry may have been opportunity-based following E.U.-entry, the new firms do not (yet) contribute to employment creation at the aggregate level. Also, the negative effect on unemployment of the cohesion funding had probably extinguished by the end of the 1990s. Taken together these two phenomena might explain the large positive residual in 2002. This is also consistent with the earlier observation that the proportion of micro-firms in the Portuguese economy has increased during the last decade of the previous century (see Figures 5 and 6).

5.2. Self-employment Equation (2 and 2a)

The residuals, as well as the observed and predicted self-employment rates for Portugal are displayed in Figures 7 and 8. The residuals are positive – indicating an under-estimation of the business ownership rate – for the periods of 1990 and 1994; while for 1986 and 1998 the model provides higher predicted values for the self-employment rate than those actually observed (negative residuals). For 2002 the residual is close to zero. The unsystematic nature of the estimated residuals underlines the validity of the model formed by Equations (1) and (2) since, ideally, the disturbances should be independently distributed. Again part of the discrepancies observed between real and predicted unemployment in Portugal could be explained by macro-economic fluctuations that followed Portugal's entry in the E.U.

As was shown above, high rates of business ownership and a predominance of micro-businesses are distinguishing characteristics of the Portuguese economy. It was argued that this is probably associated with the high significance of necessity-based entrepreneurial activity. Such kind of entrepreneurial efforts result from a lack of better alternatives for subsistence. The prevalence of this kind of entrepreneurial activity suggests that there should be a strong positive effect of increases in unemployment rates on self-employment rates, as the newly unemployed would tend to look at self-employment as a viable subsistence choice.

The features of Portuguese industrial dynamics suggest therefore that the model estimated from data on 23 OECD countries should systematically under-estimate the effect of increases in the unemployment rate on increases in the self-employment rate, i.e., that residuals should be positive. From

Figure 1 we see that significant increases in the unemployment rate occurred only in the mid-1970s and the early 1990s. Considering the lags in the model this should – according to the hypothesis formulated above – have led to positive residuals in 1986, 1998 and 2002.

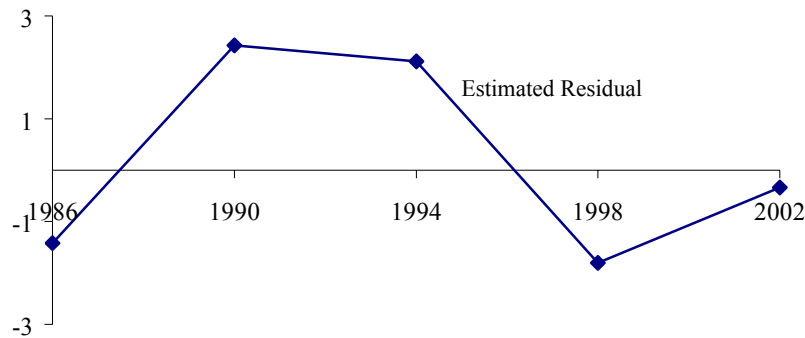


FIGURE 7: ESTIMATED RESIDUALS FOR PORTUGAL 1986-2002 IN %-POINTS (EQUATION 2A)

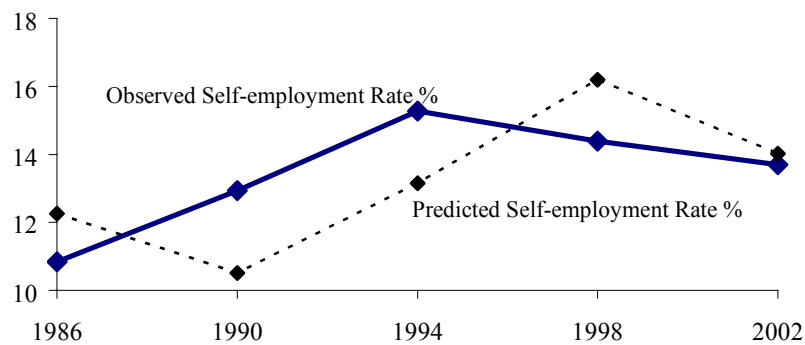


FIGURE 8: OBSERVED AND PREDICTED SELF-EMPLOYMENT RATES IN PORTUGAL 1986-2002

However, from Figure 7 we see that residuals are negative in these periods. This can be explained by counteracting effects on the business ownership rates in these periods, which were already described in Section 3. In the period prior to E.U.-entry (1982-1986) government policies protecting jobs and stimulating the public sector prevented the business ownership rate from rising while from the mid-1990s onwards consolidation and “shakeout” occurred in some markets following the first waves of cohesion funding after E.U.-entry. We argue that if these counteracting effects would not have

occurred the residuals might have been positive in these periods, consistent with the hypothesis of increasing unemployment rates having a stronger impact on self-employment rates in Portugal compared to other OECD countries.

For the years 1990 and 1994 we find relatively large positive residuals (Figure 7). Similar to the negative residuals in the unemployment equation for these periods (Figure 2) the reason for this is probably the E.U.-entry in 1986. From the outset of E.U. integration, business ownership rates in Portugal increased significantly, as displayed in Figure 1. While, as pointed out above, the first waves of cohesion funding were applied mostly for infra-structural projects and growth of incumbents, several factors acted towards favoring an increase in start-ups and, therefore, business ownership rates. Among these factors, the growth in financial services associated with deregulation (which had started in 1982) played a significant role by improving credit conditions for new businesses. Moreover, European integration opened up new geographic markets and created new business opportunities, some of which were exploited by new businesses. It is likely that the general atmosphere of confidence in future development favored a growth in business ownership rates that could not be anticipated by the model. However, as explained in Section 5.1, the contribution to economic development of the increased start-up activity may have been limited.

Finally we note that, from 1996 onwards, after a cycle of significant growth which started in the mid-1980s, the Portuguese business ownership rate started declining as a result of both industry consolidation and the failure of many of the start-ups that appeared in the previous decade. As a result, the model's prediction for the self-employment rate 2002 is actually very close to the observed rate, suggesting that the Portuguese industrial structure – at least with regard to the effect of variations in unemployment on variations in self-employment – is approaching behavioral patterns similar to those of the average of the OECD countries, although it is still too early to confirm this hypothesis.

6. CONCLUSIONS

The Portuguese industrial structure is strongly characterized by the dominance of micro-businesses and by the significance of necessity-based entrepreneurial activity, i.e., business ownership that arises from the lack of a better alternative for subsistence, and not from opportunity recognition and exploitation. Hence, a large proportion of Portuguese business owners tend to possess lower endowments of human capital and entrepreneurial talent required to start and sustain a new firm, suggesting that the effect of

entrepreneurial activity on unemployment reduction will be smaller in Portugal than in the average of the OECD countries analyzed.

One can therefore argue that, while the specific nature of the Portuguese industrial structure and self-employment do account for differences between the model's predictions of the rate of unemployment induced by variations in self-employment, and the rates of unemployment actually observed, these differences are more likely to be systematically positive, sanctioning the view that entrepreneurial activity in Portugal has smaller negative effects on future unemployment than in other developed countries. The negative residuals experienced in 1990 and 1994 – which seem to contradict this hypothesis – are likely to result from the strong positive effect on employment rates that was set off by entry in the E.U. and the impact of cohesion funding on public works and incumbent growth.

The same logic can be applied to the opposite relationship, i.e., the effect of increases in unemployment rates on business ownership rates. The significance of necessity-based entrepreneurial activity in Portugal suggests that the effect on variations in unemployment rates should be greater in Portugal than for the average of the OECD countries analyzed. One would therefore expect systematic positive residuals, sanctioning the view that a large proportion of self-employment in Portugal results from a lack of better alternatives (and not from opportunity recognition), increasing significantly as a result of increases in unemployment rates. Contrary to this hypothesis we found negative residuals for two of the periods. However we explained that these were due to specific counter effects that occurred in these periods in Portugal thereby providing support for the hypothesis that residuals may be systematically positive for Portugal.

Having carefully analyzed the residuals for both model equations it can then be concluded that differences between Portugal and other developed countries should be consistent in the following respects:

- i) Systematically positive residuals for the (negative) effect of increases in self-employment rates on unemployment rates, suggesting that entrepreneurial activity in Portugal has a smaller positive effect on employment creation than in other OECD countries;
- ii) Systematically positive residuals for the effect of variations in unemployment rates on self-employment rates, suggesting that a larger proportion of entrepreneurial activity in Portugal results from a lack of employment alternatives in the business sector than in other OECD countries.

These conclusions do not mean, however, that business ownership in Portugal is excessive or should be discouraged. Stimulating entrepreneurship lifts the dependency on possibly sluggish and transient resources like scale, scope and experience, and intensifies the dependency on resources like

adjustment and effectiveness. The latter resources are likely to be more robust against uncertainty and change than the former (Audretsch and Thurik, 2001 and 2004). Stimulating entrepreneurship implies stimulating diversity, which is fundamental for small firms to survive market selection processes.

While the results and conclusions suggest that some significant proportion of entrepreneurial activity in Portugal does not arise from opportunity recognition and is not aimed at growth and market selection, it can also be expected that entrepreneurial efforts will evolve in that direction and that industrial dynamics in Portugal will converge towards the pattern displayed by other OECD countries. The small residual in the self-employment equation for 2002 gives some support for this hypothesis. Some other support for this hypothesis can be found in the wide variety of initiatives undertaken in recent years by universities and public institutions to promote a culture of technology-based entrepreneurship and support innovative start-ups towards a knowledge-based economy¹³. Further enhancement of such activities and of the science and technology base underpinning their development, as well as growing support from the private sector, may contribute to an industrial restructuring process where a higher proportion of new firm start-ups play a significant role in bringing down unemployment.

NOTES

¹ There is an extensive literature about occupational choice and the self-employment option. See Parker (2004) for a survey.

² For instance, see Lin, Manser and Picot (1998).

³ For instance, see Geroski (1989); Nickell (1996) and Nickell, Nicolitsas and Dryden (1997).

⁴ Similar analyses of residuals are provided by Thurik and Verheul (2003) for Spain; Thurik (2003) for the U.K.; and van Acht, Stam, Thurik and Verheul (2004) for Japan.

⁵ Klepper (1996) discusses the “shakeout” phenomenon in which, following an initial wave of entry, a phase of consolidation is observed in most markets, whereby a dominant product design emerges and scale economies become more prevalent.

⁶ The inclusion of country dummies in the model was rejected by standard likelihood ratio tests. Indeed in Section 5 we will see that the estimated residuals for Portugal are unsystematic in that positive and negative values alternate.

⁷ The Granger (1969) approach to the question of whether x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. y is said to be Granger-caused by x if x helps in the prediction of y , or equivalently if the coefficients on the lagged x 's are statistically significant. This can be tested using a simple F-test on the lagged x 's.

- ⁸ The harmonizations mainly concern corrections for the number of incorporated self-employed (harmonization across countries) and corrections for trend breaks (harmonization over time). The 23 countries included in COMPENDIA are the (old) E.U.-15 as well as Iceland, Norway, Switzerland, U.S., Japan, Canada, Australia and New Zealand.
- ⁹ Audretsch, Carree, van Stel and Thurik (2005) refer to Geroski (1995), Beesley and Hamilton (1984) and Fritsch and Mueller (2004) for empirical examples of this lag.
- ¹⁰ Note from Table 1 that the model contains a lag of 12 years. Hence the oldest year for which the unemployment and self-employment rates are predicted by the model is 1986.
- ¹¹ See Caves (1998) for a review of the determinants of new form survival and growth.
- ¹² Portuguese labor productivity represented 50 percent of E.U. average in 2004 (IAPMEI, 2005, p. 6).
- ¹³ See, for instance, IAPMEI (2005), p. 24, as well as <http://www.neotec.gov.pt/>, <http://www.adi.pt/Nest.htm>, and <http://www.green-wheel.net/>.

REFERENCES

- Acs, Z. J., and D. B. Audretsch (2003), "Innovation and Technological Change," in Z. J. Acs and D. B. Audretsch (eds.), *Handbook of Entrepreneurship Research*, Boston/Dordrecht: Kluwer Academic Publishers, 55-79.
- Acs, Z. J., P. Arenius, M. Hay and M. Minniti (eds.) (2005), *Global Entrepreneurship Monitor – 2004 Summary Report*, Babson College and London Business School.
- Acht, J. van, J. Stam, A. R. Thurik and I. Verheul (2004), "Business Ownership and Unemployment in Japan", Papers on Entrepreneurship, Growth and Public Policy #09-2004, Max Planck Institute of Economics, Jena, Germany.
- Audretsch, D. B., M. A. Carree, A. J. van Stel and A. R. Thurik (2005), "Does Self-Employment Reduce Unemployment?," Papers on Entrepreneurship, Growth and Public Policy #07/2005. Max Planck Institute of Economics, Jena, Germany.
- Audretsch, D. B., A. R. Thurik, I. Verheul and S. Wennekers (2002), *Entrepreneurship: Determinants and Policy in a European-US Comparison*, Boston/Dordrecht, Kluwer Academic Publishers.
- Audretsch, D. B. and A. R. Thurik (2001), "What is New about the New Economy: Sources of Growth in the Managed and Entrepreneurial Economies," *Industrial and Corporate Change*, 10(1), 267-315.
- Audretsch, D. B. and A. R. Thurik (2004), "The Model of the Entrepreneurial Economy," *International Journal of Entrepreneurship Education*, 2(2), 143-166.
- Audretsch, D. B. and M. Keilbach (2004), "Entrepreneurship Capital and Economic Performance," *Regional Studies*, 38(8), 949-959.
- Baptista, R., V. Escária and P. Madruga (2005), "Entrepreneurship, Regional Development and Job Creation: the Case of Portugal", Papers on Entrepreneurship, Growth and Public Policy #06/2005. Max Planck Institute of Economics, Jena, Germany.
- Beesley, M. E. and M. T. Hamilton (1984), "Small Firms' Seedbed Role and the Concept of Turbulence", *Journal of Industrial Economics*, 33(2), 217-231.
- Carree, M. A. and A. R. Thurik (2003), "The Impact of Entrepreneurship on Economic Growth," in D. B. Audretsch and Z. J. Acs (eds.), *Handbook of Entrepreneurship Research*, Boston/Dordrecht, Kluwer Academic Publishers, 437-471.

- Caves, R. E. (1998), "Industrial Organization and New Findings on the Turnover and Mobility of Firms," *Journal of Economic Literature*, 36(4), 1947-1982.
- Escária, V. and P. Madrugá (2002), "The Construction of a Longitudinal Matched Employer-Employee Microdata Data Set", Mimeo, CIRIUS, ISEG, Technical University of Lisbon.
- Fritsch, M., and P. Mueller (2004), "The Effects of New Business Formation on Regional Development over Time", *Regional Studies*, 38(8), 961-975.
- Geroski, P. A. (1989), "Entry, Innovation, and Productivity Growth," *Review of Economics and Statistics*, 71(4), 572-578.
- Geroski, P. A. (1995), "What Do We Know About Entry?," *International Journal of Industrial Organization*, 13(5), 421-440.
- Granger, C. W. J. (1969), "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods," *Econometrica*, 37(3), 424-438.
- Hurst, E. and A. Lusardi (2004), "Liquidity Constraints, Household Wealth and Entrepreneurship," *Journal of Political Economy*, 112(2), 319-347.
- IAPMEI (2005), *Portuguese Economic Profile*, mimeo.
- Klepper, S. (1996), "Entry, Exit, Growth, and Innovation over the Product Life Cycle," *American Economic Review*, 86(3), 562-583.
- Lin, Z. M., E. Manser and G. Picot (1998), "The Role of Self-Employment in Job Creation in Canada and the U.S.", OECD-CERF-CILN International Conference on Self-Employment, Burlington, Ontario, Canada.
- Nickell, S. J. (1996), "Competition and Corporate Performance," *Journal of Political Economy*, 104(4), 724-746.
- Nickell, S. J., P. Nicolitsas and N. Dryden (1997), "What Makes Firms Perform Well?," *European Economic Review*, 41(3-5), 783-796.
- Parker, S. C. (2004), *The Economics of Self-Employment and Entrepreneurship*, Cambridge: Cambridge University Press.
- Sims, Ch. A. (1980), "Macroeconomics and Reality," *Econometrica*, 48(1), 1-48.
- Stel, A. J. van (2005), "COMPENDIA: Harmonizing Business Ownership Data Across Countries and Over Time", *International Entrepreneurship and Management Journal*, 1(1), 105-123.
- Stel, A. J. van, M. A. Carree and A. R. Thurik (2005), "The Effect of Entrepreneurial Activity on National Economic Growth", *Small Business Economics*, 24(3), 311-321.
- Thurik, A. R. (2003), "Entrepreneurship and unemployment in the U.K.," *Scottish Journal of Political Economy*, 50(2), 264-290.
- Thurik, A. R. and I. Verheul (2003), "The Relationship between Entrepreneurship and Unemployment: the Case of Spain," in: D. Urbano (ed.), *Entrepreneurship (Creación de Empresas)*, Barcelona, Servei de Publicacions de la UAB, 521-547.