DISCUSSION PAPER SERIES

No. 5057

DOES SELF-EMPLOYMENT REDUCE UNEMPLOYMENT?

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ISSN 0265-8003

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Discussion Paper No. 5057
May 2005

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CEPR Discussion Paper No. 5057

May 2005

ABSTRACT

Does Self-Employment Reduce Unemployment?*

This paper investigates the dynamic interrelationship between self-employment and unemployment rates. On the one hand, unemployment rates may stimulate start-up activity of self-employed. On the other hand, higher rates of self-employment may indicate increased entrepreneurial activity reducing unemployment in subsequent periods. These two effects have resulted in considerable ambiguities about the interrelationship between unemployment and entrepreneurial activity. This paper introduces a two equation vector autoregression model capable of reconciling these ambiguities and tests it for data of 23 OECD countries over the period 1974-2002. The empirical results confirm the two distinct relationships between unemployment and self-employment, i.e. 'refugee' and 'entrepreneurial' effects. We also find that the 'entrepreneurial' effects are considerably stronger than the 'refugee' effects.

JEL Classification: L11 and M13
Keywords: entreprenuership and Gibrat's law

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*This paper is the result of a series of visits by David Audretsch as a Visiting Research Fellow at the Tinbergen Institute and by Roy Thurik and Martin Carree as Ameritech Research Scholars at the Institute for Development Strategies, Indiana University. Martin Carree is grateful to the Royal Netherlands Academy of Arts and Sciences (KNAW) for financial support. The authors acknowledge the comments of Adam Lederer and Lorraine Uhlaner.

Submitted 20 April 2005

Does Self-Employment Reduce Unemployment?

1. Introduction

The relationship between unemployment and self-employment has been shrouded with ambiguity. The simple theory of income choice has been the basis for a range of studies focusing on the decision of individuals to start a firm and become an entrepreneur. This 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 (Blau, 1987; Evans and Jovanovic, 1989; Evans and Leighton, 1990; Blanchflower and Meyer, 1994). However, there is an important counterargument that unemployed tend to possess lower endowments of human capital and entrepreneurial talent required to start and sustain a new firm, which 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 (e.g. Johansson, 2000). A low rate of business start-ups may also be a consequence of stagnant economic growth, which correlates with higher levels of unemployment (Audretsch, 1995). Entrepreneurial opportunities are not just the result of the push effect of (the threat of) unemployment but also of the pull effect produced by a thriving economy as well as by past entrepreneurial activities.

In addition to unemployment influencing start-up activity, the reverse has also been claimed to hold. New-firm start-ups hire employees, resulting in subsequent decreases in unemployment (Picot et al., 1998; Pfeiffer and Reize, 2000). But, again, there is a counterargument. The low rates of survival combined with the limited growth of the majority of small firms imply that the employment contribution of start-ups is limited at best, which would argue against entrepreneurial activities reducing unemployment. As Geroski (1995) has documented, the penetration rate, or employment share, of new start-ups is remarkably low.

The ambiguities found in the empirical evidence reflect these two conflicting forces. Some studies have found that unemployment is associated with increased entrepreneurial activities, but others have come to the opposite conclusion, that entrepreneurial activity and unemployment are inversely related. For example, Evans and Leighton (1990) found that unemployment is positively associated with the propensity to start a new firm, but Garofoli (1994) as well as Audretsch and Fritsch (1994) found that unemployment is negatively related to new-firm start-ups. Carree (2002) found that no statistically significant relationship exists. In reviewing the (early) empirical evidence relating unemployment rates to new-firm start-up activity, Storey (1991, p. 177) concludes that, "The broad consensus is that time series analyses point to unemployment being, ceteris paribus, positively associated with indices of new-firm formation, whereas cross sectional, or pooled cross sectional studies appear to indicate the reverse. Attempts to reconcile these differences have not been wholly successful." Audretsch and Thurik (2000) present empirical evidence that an increase in the number of business owners reduces the level of unemployment. They identify an "entrepreneurial" effect in terms of the positive impact on employment resulting from the entry of new firms. However, Blanchflower (2000) finds no positive impact for OECD countries of self-employment rates on GDP growth and Carree et al. (2002) suggest that countries with relatively low self-employment rates benefit from increased self-employment in terms of GDP growth, but that countries with relatively high self-employment rates (like Italy) do not.

Thus, there are not just theoretical reasons, but also empirical support, albeit contested, that while unemployment leads to increased entrepreneurial activity, self-employment leads to reduced unemployment. Unravelling the relationship between entrepreneurship and unemployment is crucial, because policy is frequently based on assumptions that do not reflect the ambiguities described. The purpose of the present paper is to try to reconcile the ambiguities found in the relationship between unemployment and start-up activity. We do this by introducing a two-equation vector autoregression model where changes in unemployment and self-employment are linked to subsequent changes in those variables for a panel of 23 OECD countries.

2. Linking Entrepreneurship to Unemployment

The notion that unemployment is linked to entrepreneurial activity dates back at least to Oxenfeldt (1943), who pointed out that individuals confronted with unemployment and low prospects for wage-employment turn to self-employment as a viable alternative. This was an extension of Knight's (1921) view that individuals make a decision among three states – unemployment, self-employment and employment. The actual decision is shaped by the relative prices of these three activities but there was a clear prediction that self-employment would be positively related to unemployment.

However, as Storey (1991) documents, the empirical evidence linking unemployment to entrepreneurial activity is fraught with ambiguities. While some studies find that greater unemployment serves as a catalyst for start-up activity (Reynolds, Miller and Makai, 1995; Reynolds, Storey and Westhead, 1994; Hamilton, 1989; Highfield and Smiley, 1987, and Yamawaki, 1990; Evans and Leighton, 1989 and 1990), still others have found that unemployment reduces the amount of entrepreneurial activity (Audretsch and Fritsch, 1994; Audretsch, 1995).

Why should an increased amount of entrepreneurial activity impact unemployment? One approach to address this question can be inferred from the literature on Gibrat's Law. Gibrat's Law asserts that firm growth is independent of size. Sutton (1997, p. 43) interprets it as "the probability that the next opportunity taken up by any particular active firm is proportional to the current size of the firm" An important implication of Gibrat's Law is that shifting employment from large to small enterprises should have no impact on total employment, since the expected growth rates of both types of firms are identical. Thus, a restructuring of the economy away from large enterprises and towards small ones should have no impact on the unemployment rate.

However, there is strong and systematic empirical evidence suggesting that, in fact, Gibrat's Law does not hold across a broad spectrum of firm sizes. Two comprehensive and exhaustive compilations (Sutton, 1997; and Caves, 1998) of studies relating firm size to growth have produced what Geroski (1995) terms as a stylised fact that smaller firms have higher growth rates than their larger counterparts. Beginning with the pioneering studies by Evans (1987a and 1987b) and Hall (1987), along with Dunne, Roberts, and Samuelson (1988 and 1989), a central finding of this literature is that firm growth is negatively related to firm size and age. These findings have been confirmed in virtually every subsequent study undertaken, despite differences in country, time period, industry, and methodology used. More specifically, the evidence has been especially strong for the very young and very small firms to outperform their older and larger counterparts in terms of employment creation even when not corrected for their higher probabilities of exit. Some studies have indicated that the age and size effects disappear after a few years and above a certain employment size (Hart and Oulton, 1999).

The rate of self-employment represents a specific measure of the presence of small firms in an economy. However, it is not obvious that higher self-employment rates would automatically lead to improved economic performance. In fact, self-employment rates in some countries may be inefficiently high (Carree et al., 2002) being a characteristic of lack of use of economies of scale in production and R&D more than of vibrant entrepreneurial activity. We assume that the unemployment rate U_{it} in country *i* and period *t* is *positively* affected by the extent to which the self-employment rate $E_{i,t-1}$ was different from the country-specific optimal rate (in terms of employment creation), E_i^*. The unemployment rate is equal to the level U_{it}^* that would be present in case the actual self-employment rate would be equal to the optimal rate ($E_{i,t-1} = E_i^*$) plus a penalty determined by the absolute difference between $E_{i,t-1}$ and E_i^*:

$$(1)\ U_{it} = U_{it}^* + \varsigma \left| E_{i,t-1} - E_i^* \right|$$

where $\varsigma > 0$. Taking the first difference of equation (1) gives

$$(2)\ U_{it} - U_{i,t-1} = \varsigma \left(\left| E_{i,t-1} - E_i^* \right| - \left| E_{i,t-2} - E_i^* \right| \right) + \varepsilon_{it}$$

where $\varepsilon_{it} = \Delta U_{it}^*$ stands for the effect of changes in institutional, socio-economic and other factors (with exception of the self-employment rate variable) on the unemployment level. The self-employment rates change only slowly over time. Therefore, there are three relevant cases for the relation between the self-employment rate and the country-specific optimal rate. First, both the self-employment rate in period t-1 and t-2 are higher than the optimal rate (case 3a). Second, they are both less than the optimal rate (case 3b). Third, one is higher than the optimal rate and one is less, however both are then relatively close to the optimal rate (case 3c). As a result of these three different possibilities equation (2) changes as follows: [1]

$$(3a)\ E_{i,t-1} > E_i^* \wedge E_{i,t-2} > E_i^*: \quad \Delta U_{it} = \varsigma \Delta E_{i,t-1} + \varepsilon_{it}$$

$$(3b)\ E_{i,t-1} < E_i^* \wedge E_{i,t-2} < E_i^*: \quad \Delta U_{it} = -\varsigma \Delta E_{i,t-1} + \varepsilon_{it}$$

$$(3c)\ E_{i,t-1} \approx E_{i,t-2} \approx E_i^*: \quad \Delta U_{it} \approx \varepsilon_{it}$$

Equations (3a) through (3c) show that the sign of the parameter of $\Delta E_{i,t-1}$ reflects whether the self-employment rate is below or above (or about equal to) the optimal levels for the countries under consideration. In case the parameter is positive, the self-employment rate is too high (case 3a), whereas in case the parameter is negative, the self-employment rate is too low (case 3b). In case there is no effect of $\Delta E_{i,t-1}$ on ΔU_{it} then the self-employment rate should be close to the optimal level (case 3c). We use equation (4) to test for the effect:

$$(4)\ U_{it} - U_{i,t-1} = \beta \left(E_{i,t-1} - E_{i,t-2} \right) + \varepsilon_{it}$$

The parameter β can be both positive and negative, whereas the parameter ς introduced in equation (1) is necessarily positive. We supplement our main equation (4) with the complementary equation relating the change of the unemployment rate to the change in the self-employment rate:

[1] See Audretsch et al. (2002) for a similar approach relating economic growth to small firm presence in 17 European countries.

$$(5)\ E_{it} - E_{i,t-1} = \lambda\left(U_{i,t-1} - U_{i,t-2}\right) + \eta_{it}$$

The effect of unemployment rates on self-employment rates is the push ("refugee") effect of (recent) unemployed workers into starting their own venture to escape unemployment. In Section 4 Equations (4) and (5) will be extended to a simple VAR-model.

3. Measurement Issues

The concept of entrepreneurial activity clearly is a complex phenomenon (Wennekers and Thurik, 1999; Van Stel, Carree and Thurik, 2005). In this paper we follow the example of Storey (1991) in operationalising it as the number of self-employed. More precisely, we use the number of non-agricultural self-employed (unincorporated as well as incorporated) as a fraction of the labour force. There are a number of important qualifications that should be emphasized when using and interpreting this variable. *First*, the variable combines heterogeneous activities across a broad spectrum of sectors and contexts into one single measure. This measure treats all businesses as the same, both high-tech and low-tech. *Second*, it is not weighted for magnitude or impact: all self-employed businesses are measured identically, even though some clearly have a greater impact than others. *Third*, this variable measures the stock of self-employed businesses and not the start-up of new ones. Still, this measure has two significant advantages. The first is that, while not being a direct measure of entrepreneurship, it is a useful proxy for entrepreneurial activity (Storey, 1991). Second, it is available and can be compared across countries and over time.

The panel data set of unemployment and self-employment rates for the 23 OECD countries for the 1974-2002 period is constructed as follows. For the unemployment data, *U*, we use the standardized unemployment rate of the OECD Main Economic Indicators. The data for self-employment, *E*, are from the Compendia 2002.1 data set of EIM in Zoetermeer, The Netherlands. The Compendia data set uses data from the OECD Labour Force Statistics and other (country-specific) sources to make the self-employment data as comparable as possible across countries. See Van Stel (2005) for further details about the Compendia 2002.1 dataset. Because our prime focus in the current paper is the effect of entrepreneurial activity on unemployment we show some data for the six country/period combinations (out of 46) with the highest and lowest values of the change in the self-employment rate from 1978 to 1986 and from 1986 to 1994 in Table 1. Out of six countries with the strongest *increase* in self-employment five show a subsequent *decrease* in unemployment. The exception is Italy. Carree et al. (2002) provide evidence that Italy may have a level of self-employment that is already inefficiently high, and that further increases are counter-productive.[2] Out of six countries with the strongest *decrease* in self-employment five show a subsequent *increase* in unemployment. Portugal, a country receiving substantial net inflow of EU funds probably pushing down unemployment rates, is the exception.[3]

TABLE 1 ABOUT HERE

[2] On the other hand, the strong decrease in unemployment in Ireland between 1994 and 2002 cannot entirely be attributed to the increase in self-employment between 1986 and 1994. The strong economic performance of Ireland can also be attributed to factors like foreign direct investments and European Union subsidies. An example of a country with decreasing self-employment rates (-0.5 % point between 1978 and 1986) and subsequently decreasing unemployment rates (-3.6 % point between 1986 and 1994) is The Netherlands. The appraised Dutch 'Poldermodel', which was launched by the 1982 Wassenaar Treaty between employers' organizations and unions, is an important reason for the huge decrease in unemployment during the late 1980s and the 1990s in The Netherlands (Thurik, 1999). Therefore, entrepreneurial activity is not the only route to achieving low unemployment rates.

[3] See Baptista and Thurik (2004).

4. Model and method

The previous sections 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 unemploy-meny-entrepreneurship relationship, the previous sections suggest two testable hypotheses – that increases in entrepreneurial activity lead to a decrease in subsequent unemployment, and 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, the most natural way of testing these two hypotheses is to estimate a vector autoregression (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. In addition, a set of exogenous explanatory variables will be included in the model.[4]

In our application, we have a two equation VAR model with the change in unemployment and the change in entrepreneurial activity as dependent variables. Furthermore, we use time dummies as exogenous explanatory variables.[5] These dummies correct for business cycle effects over the sample period that are common for the countries covered by our dataset. The model reads as follows:

$$(6)\ U_{it} - U_{i,t-L} = \alpha + \sum_{j=1}^{J} \beta_j (E_{i,t-jL} - E_{i,t-(j+1)L}) + \sum_{j=1}^{J} \gamma_j (U_{i,t-jL} - U_{i,t-(j+1)L}) + \sum_{t=1}^{T} \delta_t D_t + \varepsilon_{1it}$$

$$(7)\ E_{it} - E_{i,t-L} = \kappa + \sum_{j=1}^{J} \lambda_j (U_{i,t-jL} - U_{i,t-(j+1)L}) + \sum_{j=1}^{J} \mu_j (E_{i,t-jL} - E_{i,t-(j+1)L}) + \sum_{t=1}^{T} \nu_t D_t + \varepsilon_{2it}\,,$$

where 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. We will report Granger-causality test statistics when discussing our results.[6]

Using the panel data set consisting of 23 OECD countries between 1974-2002, equations (6) and (7) are estimated using weighted least squares. We consider changes in self-employment and unemployment over periods of four years, i.e. L equals 4. Furthermore, we 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. In this respect Geroski (1995, p. 148) states that "Even successful entrants may take more than a decade to achieve a size comparable to the average incumbent." Beesley and Hamilton (1984) point at the seedbed role of new and small firms challenging incumbent firms. The essentially innovative

[4] Note that, because the same list of independent variables appear in all equations, the dynamic system can be estimated consistently and efficiently by using OLS. Hence, there is no need for joint estimation.

[5] The inclusion of country dummies in the model was rejected by standard likelihood ratio tests.

[6] Equations (6) and (7) can also be used for testing Granger-causality. 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.

seedbed activities with the inevitable trial and error (birth and death) mechanism may take more than just a few years to result in creatively destroy incumbent enterprise, the emergence of new enterprise and subsequent growth. Audretsch (1995) shows that share of total employment accounted for by a cohort of new-firm start-ups in U.S. manufacturing more than doubles as the firms age from two to six years old. However, no evidence was provided beyond six years.

Rather than imposing a lag structure for the impact of the lagged variables in equations (6) and (7), we test for the statistically superior lag structure by using likelihood ratio tests. We start by including only one lag, and then, one lag at a time, we include further lags until the LR test rejects inclusion of further lags. In terms of equations (6) and (7), this procedure determines the value of J. We avoid using data for overlapping periods as this may cause a downward bias in the estimated standard errors of the coefficients. In other words, given that we chose L equal to 4, this implies that we use data for 2002, 1998, 1994, …, 1974.

5. Results

Estimation results for the two-equation VAR model consisting of equations (6) and (7) are reported in Table 2.

TABLE 2 ABOUT HERE

As explained above, we start with including only one lag of the dependent variables (Model Ia). We computed the coefficients using the largest possible sample, given the lag structure. As the oldest year in the data set is 1974 and using one lag implies going back eight years, we can use data for 1982, 86, 90, 94, 98 and 2002. For each year we have 23 countries, hence we use 138 observations in Model Ia. From the results for equation (6) we see that changes in self-employment have a significantly negative impact on unemployment in the subsequent period. Indeed, the Granger-causality test indicates that self-employment causes unemployment (p-value below 0.05). From the results for equation (7) we see that in Model Ia, unemployment does not Granger-cause self-employment.

However, results from Model Ia may be biased because we used a too restrictive lag structure. As explained above, considerable lags may be involved in the relationship. To test this we include a second lag, representing changes in unemployment or self-employment between t-12 and t-8 (basically an eight year lag). Using an extra lag implies that we lose a year in our sample, hence the model is estimated for 115 observations (Model IIa). We apply a likelihood ratio test to see whether including the extra lag improves the statistical fit of the model. For this purpose we have to re-compute the one lag model using the 115 observations sample (Model Ib). Testing Model IIa against Model Ib gives a likelihood ratio test statistic of 24.0. As the critical value at 5% level is 9.5 (four restrictions), this implies that a model using two lags is to be preferred over a model using one lag. Analogously, testing Model III against Model IIb we conclude that adding a third lag to the model does not improve the statistical fit. Hence, we have found that model variants using two lags are statistically superior. Concentrating then on the results of Models IIa and IIb, we see that self-employment Granger-causes unemployment, and also that unemployment Granger-causes self-employment (p-values below 0.05 in all four cases).

From the signs of the coefficients and t-values in Models IIa and IIb it appears that entrepreneurial activity, as hypothesized, reduces unemployment but that this impact requires an eight year lag. The positive effect of unemployment on entrepreneurial activity seems to capitalize somewhat faster. However, given the complex interrelationship between the two variables in the model (four dependent variables enter in both equations), a more precise way to capture the impact of the variables is to use impulse response functions. These functions compute the impact over time of an exogenous shock in either of the dependent variables, taking account of the interrelationships reflected by the estimated system of equations. In Table 3 we present the impulse response function for a unit shock to entrepreneurial activity (impact on unemployment) and for a unit shock to unemployment (impact on entrepreneurial activity). Focusing on equation (6) we see that for models which include 2 or 3 lags the effect is largest for the second period of four years. For instance, a one percent point change in entrepreneurial activity brings down unemployment by 1.12 percent point eight years later. The cumulative effect converges to -1.29.

TABLE 3 ABOUT HERE

It is interesting to note that the one lag models Ia and Ib predict a maximal impact already after four years. However, this is probably caused by a too restrictive model specification (one lag models were rejected in favour of two lag models). In fact in the longer lag models the initial impact of more entrepreneurial activity on unemployment is positive. It may be the case that initially, increased competition by new entrants only leads to higher labour productivity at the industry level while industry output remains constant (Fritsch and Mueller, 2004). This would imply a negative effect on employment. Only after some time, the new entrants may grow and actually contribute to economic growth.[7] We should be careful with this type of conclusions though as t-values for the one lag self-employment variables are low as shown in Table 2.

The negative effect of self-employment on subsequent unemployment is in conformity with the stylised fact that Gibrat's "Law of Proportional Effect" does not hold. The results from estimating equation (6) suggest that growth rates are enhanced when there is a greater presence of entrepreneurial firms and are lower when there is a greater presence of large enterprises. As the evidence testing Gibrat's Law indicates, small and new firms grow at systematically higher rates than their larger and older counterparts; thus, countries with a greater increase in entrepreneurial activity also experience systematically higher growth rates.

The 'failure' of Gibrat's Law might be linked to a Schumpeterian process of new and small firms generating new products and production processes following a trial and error process with the consequence that older products and production processes are replaced. This Schumpeterian process is driven by a sequence of independent and isolated opportunities (Sutton, 1997, p. 48). In the Kirznerian perspective (Kirzner, 1973) entrepreneurship is the response to these previously unnoticed profit opportunities.[8] This may lead to more consumer satisfaction at lower cost, hence to economic growth and lower levels of unemployment. Profit opportunities may not only spur entrepreneurial activity, but may also be generated by entrepreneurs starting new firms. This idea dates back to Schumpeter (1934) and Hayek (1945): modern decentralized economies allowing individuals to act on their entrepreneurial views and allowing individuals to be rewarded for it produces entrepreneurial opportunities and subsequent growth.

Table 3 shows that changes in unemployment have a positive impact on subsequent self-employment. This is in line with many earlier findings (Reynolds, Miller and Makai, 1995; Reynolds, Storey and Westhead, 1994; Hamilton, 1989; Highfield and Smiley, 1987; Yamawaki, 1990; Evans and Leighton, 1989 and 1990). This is the "refugee" effect of unemployment stimu-

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[7] In their study of new business formation and regional development over time Fritsch and Mueller (2004) find that the peak of the positive impact of new businesses is reached about eight years after entry. This is similar to the time lag in our study. Fritsch and Mueller, however, apply the Almon lag model and discriminate between indirect effects of new business formation (crowding out of competitors, improvement of supply conditions and improved competitiveness) and a direct effect (the jobs created in the new businesses).

[8] See Yu (1998) for an examination of the role of adaptive entrepreneurship and its role in the dynamics of Hong Kong's economy.

lating start-up and self-employment rates. The results here indicate that the impact of a one percent point increase in unemployment leads to a 0.16 percent point increase in self-employment after eight years. Note however that the "refugee" effect is considerably smaller than the "entrepreneurial effect", i.e. the magnitude of the impacts in the lower part of Table 3 is much smaller compared to the effects reported in the upper part of the table.

6. Conclusions

The literature addressing the relationship between unemployment and entrepreneurial activity has produced ambiguous results at best. While some studies find a positive link between unemployment and start-up or self-employment rates (the "refugee" effect), still others find evidence supporting a negative relationship (the "entrepreneurial" effect). Furthermore, there is both a "recession-push" and a "prosperity-pull" aspect of the relation between unemployment and self-employment. Unemployment reduces the opportunities of enjoying a paid job and stimulates searching for one. This "pushes" people into self-employment. High unemployment is likely to coincide with a limited market demand for self-employed output "pulling" them out of self-employment (Parker, 2004). The present study attempts to disentangle what is obviously a complex relationship. Based on empirical evidence from OECD countries for a recent period, the evidence suggests that the relationship between unemployment and entrepreneurship is, in fact, both negative and positive. Changes in unemployment clearly have a positive impact on subsequent changes in self-employment rates. At the same time, changes in self-employment rates have a negative impact on subsequent unemployment rates. The latter effect is even stronger than the former effect. Because these are essentially dynamic intertemporal relationships, previous studies estimating contemporaneous relationships have confounded what are, in fact, two relationships each working in the opposite direction and with different time lags. One issue in future research is the incorporation of possible additional variables determining self-employment and unemployment rates, thereby extending the VAR-model.

The small business sector, and hence business ownership, is of considerable importance in all OECD economies. New and small firms are a major vehicle for entrepreneurship to thrive (Audretsch and Thurik, 2001). The present paper shows the importance of the role that entrepreneurial activity can play in reducing unemployment. However, it should be stressed that the empirical evidence refers to the 1974-2002 period and that OECD-countries with already relative high self-employment rates (like the Mediterranean countries) that continue to promote self-employment need not necessarily expect a drop in the unemployment rate.

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Table 1: Ranking of countries with respect to change in self-employment rate (in % points) for periods 1978-86 and 1986-94

Country	Year (t)	E_t-E_{t-8}	U_{t+8}-U_t
Portugal	1994	4.5	-2.0
Ireland	1994	2.6	-10.3
Iceland	1994	2.6	-1.4
United Kingdom	1994	2.2	-4.5
Italy	1986	2.1	0.5
Canada	1994	2.1	-2.6
Portugal	1986	-0.9	-1.5
Austria	1986	-1.1	0.5
Luxembourg	1994	-1.1	0.2
Luxembourg	1986	-1.4	1.1
Denmark	1986	-1.6	2.6
Japan	1994	-2.0	2.5

Source: Compendia 2002.1

Note: E_t and U_t are the selfemployment and unemploymet rates in period t

Table 2: Estimation results VAR model for 1, 2 and 3 four-year period time lags

		Model Ia 1 lag	Model Ib 1 lag	Model IIa 2 lags	Model IIb 2 lags	Model III 3 lags
equation (6): dependent variable $U_t - U_{t-4}$						
Constant	α	0.030 (7.3)	0.005 (1.1)	0.007 (1.4)	-0.008 (1.8)	-0.009 (1.8)
$E_{t-4} - E_{t-8}$	β_1	-0.587 (2.5)	-0.462 (1.8)	0.091 (0.3)	0.309 (1.0)	0.279 (0.9)
$E_{t-8} - E_{t-12}$	β_2			-1.13 (3.8)	-1.06 (3.4)	-0.793 (2.4)
$E_{t-12} - E_{t-16}$	β_3					-0.630 (1.8)
$U_{t-4} - U_{t-8}$	γ_1	-0.143 (1.6)	-0.175 (1.9)	-0.246 (2.7)	-0.234 (2.3)	-0.334 (3.1)
$U_{t-8} - U_{t-12}$	γ_2			-0.027 (0.3)	-0.112 (1.1)	-0.157 (1.5)
$U_{t-12} - U_{t-16}$	γ_3					0.093 (0.8)
R-squared		0.439	0.319	0.403	0.444	0.474
P-value Granger causality test		0.015	0.076	0.000	0.003	0.002
equation (7): dependent variable $E_t - E_{t-4}$						
Constant	κ	0.004 (2.7)	-0.001 (0.3)	-0.002 (1.5)	-0.000 (0.3)	-0.001 (0.7)
$U_{t-4} - U_{t-8}$	λ_1	0.031 (1.1)	0.042 (1.4)	0.067 (2.2)	0.057 (1.5)	0.046 (1.1)
$U_{t-8} - U_{t-12}$	λ_2			0.090 (2.8)	0.088 (2.4)	0.093 (2.4)
$U_{t-12} - U_{t-16}$	λ_3					0.056 (1.3)
$E_{t-4} - E_{t-8}$	μ_1	0.416 (5.4)	0.422 (5.0)	0.329 (3.5)	0.289 (2.5)	0.246 (2.0)
$E_{t-8} - E_{t-12}$	μ_2			0.167 (1.7)	0.213 (1.8)	0.220 (1.7)
$E_{t-12} - E_{t-16}$	μ_3					0.016 (0.1)
R-squared		0.340	0.333	0.385	0.366	0.379
P-value Granger causality test		0.284	0.176	0.006	0.044	0.074
N		138	115	115	92	92
Loglikelihood		-563.9	-469.0	-457.0	-368.6	-364.7

Note: Absolute t-values are between brackets. The results are from a weighted vector autoregression (VAR) with population as weighting variable. Coefficients for year dummies are not reported.

Table 3: Impulse response functions for unit changes in self-employment and unemployment

	Model Ia 1 lag		Model Ib 1 lag		Model IIa 2 lags		Model IIb 2 lags		Model III 3 lags	
	Effect of unit change in self-employment on unemployment: equation (6)									
Lag (years)	Effect	Cumulative	Effect	Cumulative	Effect	Cumulative	Effect	Cumulative	Effect	Cumulative
4	-0.59	-0.59	-0.46	-0.46	0.09	0.09	0.31	0.31	0.28	0.28
8	-0.16	-0.75	-0.11	-0.58	-1.12	-1.03	-1.04	-0.73	-0.82	-0.54
12	-0.07	-0.82	-0.05	-0.63	-0.07	-1.10	0.00	-0.73	-0.51	-1.05
16	-0.03	-0.84	-0.02	-0.65	-0.26	-1.36	-0.18	-0.91	-0.02	-1.08
Asymptot		-0.86		-0.66		-1.29		-0.97		-1.27
	Effect of unit change in unemployment on self-employment: equation (7)									
Lag (years)	Effect	Cumulative	Effect	Cumulative	Effect	Cumulative	Effect	Cumulative	Effect	Cumulative
4	0.031	0.031	0.042	0.042	0.067	0.067	0.057	0.057	0.046	0.046
8	0.009	0.040	0.010	0.052	0.095	0.163	0.091	0.148	0.089	0.135
12	0.004	0.044	0.005	0.057	0.023	0.186	0.016	0.163	0.055	0.190
16	0.001	0.045	0.002	0.058	0.022	0.208	0.021	0.184	0.019	0.209
Asymptot		0.046		0.059		0.190		0.186		0.212