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Abstract: The relationship between unemployment and entrepreneurship has been shrouded with ambiguity. On the one hand, one strand in the literature has found that unemployment stimulates entrepreneurial activity, which has been termed as a "refugee effect". On the other hand, a very different strand in the literature has identified that higher levels of entrepreneurship reduce unemployment, or what has been termed as a "Schumpeter effect". Taken together, these two relationships result in considerable ambiguities about the relationship between unemployment and entrepreneurship. The purpose of this paper is to try to reconcile these ambiguities by introducing a two-equation model, where changes in unemployment and in the number of business owners are linked to subsequent changes in those variables. The model is tested for a panel of 23 OECD countries over the period 1974-1998. The empirical results confirm the two distinct and separate relationships between unemployment and entrepreneurship, i.e. "Schumpeter" and "refugee" effects.

Keywords: entrepreneurship, unemployment, Gibrat's Law.

JEL classification: L11, M13, O11.

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1. Introduction

The relationship between unemployment and entrepreneurship has been shrouded with ambiguity. On the one hand, the simple theory of income choice, which has been the basis for numerous studies focusing on the decision confronted by individuals to start a firm and become an entrepreneur (Blau, 1987; Evans and Leighton, 1990; Evans and Jovanovic, 1989; and Blanchflower and Meyer, 1994) suggests that increased unemployment will lead to an increase in startup activity on the grounds that the opportunity cost of not starting a firm has decreased. On the other hand, the unemployed tend to possess lower endowments of human capital and entrepreneurial talent required to start and sustain a new firm (Lucas, 1978; Jovanovic, 1982), suggesting that high unemployment is associated with a low degree of entrepreneurial activities. A low rate of entrepreneurship may also be a consequence of the low economic growth levels, which also reflect 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 of produced by a thriving economy as well as by entrepreneurial activities in the past.[1] In addition to unemployment leading to more or less entrepreneurial activity, the reverse has also been claimed to hold. One the one hand, new-firm startups hire employees, resulting in subsequent decreases in unemployment (Picot et al., 1998 and Pfeiffer and Reize, 2000a). On the other hand, the low rates of survival combined with the limited growth of the majority of small firms imply that the employment contribution of startups 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 startups is remarkably low.

The ambiguities found in the empirical evidence reflect these two conflicting forces. Some studies have found that unemployment is associated with greater entrepreneurial activities, but others have come to the opposite conclusion, that entrepreneurship and unemployment are inversely related. For example, Evans and Leighton (1990) found that unemployment is positively associated with a greater propensity to start a new firm, but Garofoli (1994) and Audretsch and Fritsch (1994) found that unemployment is negatively related to new-firm startups, and Carree (2002) found that no statistically significant relationship exists. Audretsch and Thurik (2000) show that an increase in the number of business owners reduces the level of unemployment. They identify a “Schumpeter” effect in terms of the positive impact on employment resulting from the entry of new firms. In reviewing the empirical evidence relating unemployment rates to new-firm startup 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.”

Thus, while there are not just theoretical reasons, but also empirical support as well, that while unemployment leads to increased entrepreneurial activity, entrepreneurship leads to reduced unemployment. Unravelling the relationship between entrepreneurship and unemployment is crucial, because policy is frequently on assumptions that do not reflect this ambiguity. For example, in advocating a greater role for public policy to promote entrepreneurship in Europe, the President of the European Commision, Romano Prodi (2002), recently asserted that “increases in entrepreneurial activity tend to

[1] Entrepreneurial capability (Lucas, 1978; Oi, 1983) and risk attitude (Kihlstrom and Laffont, 1979) are two determinants of entrepreneurship often found in models endogenizing entrepreneurial supply (Blanchflower and Oswald, 1998; Audretsch et al., 2002). See also Parker (1996) for support of both push and pull effects.

result in higher subsequent growth rates and a reduction of unemployment." The purpose of the present paper is to try to reconcile the ambiguities found in the relationship between unemployment and entrepreneurship[2]. We do this by introducing a two equation model where changes in unemployment and self-employment are linked to subsequent changes in those variables for a panel of 23 OECD countries.

In the following section we introduce a framework, based on the Gibrat's Law literature, for analyzing the employment impact of shifting employment from large to small firms. In the third section a computational example is given. In the fourth section measurement issues are discussed. The empirical model and the results are presented in the fifth section. Finally, in the last section a summary and conclusions are given. We find unambiguous evidence that increases in entrepreneurial activity lead to reductions in unemployment rates. In addition, the evidence suggests that increases in the unemployment rate are associated with subsequent increases in entrepreneurial activity.

2. Linking Entrepreneurship to Unemployment

That unemployment is linked to entrepreneurship 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 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 entrepreneurship would be positively related to unemployment.

However, as Storey (1991) documents, the empirical evidence linking unemployment to entrepreneurship is fraught with ambiguities. While some studies find that greater unemployment serves as a catalyst for startup 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).

On the other hand, 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 "Gibrat's Legacy", 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 stylized 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.

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[2] The concept of entrepreneurship is usually ill-defined and frustrates straightforward measurement and hence establishment of its role in the economy (O'Farrell, 1986 and Wennekers and Thurik, 1999). In the present paper we equate entrepreneurship to self-employment, i.e., the number of business owners. The terms will be used interchangeably.

Thus, if the growth rates of smaller firms systematically exceed those of their larger counterparts, restructuring economic activity away from large firms and towards new and small firms should not result in a neutral impact on employment. Rather, the higher growth rates of small firms should result in lower unemployment rates.

Formally, this can be shown by starting with the basic structure used to test Gibrat's Law, which relates the employment size, E, of firm i at time t-1, to growth in period t,

(1) $\ln(E_{it}) - \ln(E_{i,t-1}) = a - b\ln(E_{i,t-1})$,

where $b > 0$, which implies

(2) $E_{it} = e^{a} E_{i,t-1}^{1-b}$.

Firms do not change size only in the case $E_{it-1} = e^{a/b}$. Assume that the labor force equals *L*, that there are *M* large firms and that these variables do not change over time. Workers can either be employed by a small firm (i.e. managed by an entrepreneur), by a large firm, or be unemployed:

(3) $L = N_t s_t + M r_t + U_t$,

where N_t is the number of entrepreneurs, s_t is the average number of employees employed by them, r_t is the average number of employees at large firms and U_t is the number of unemployed. We assume that in the first period the number of employees at small firms is below the size at which firms do not change size while the number of employees at large firms is above this level, or $s_1 < e^{a/b} < r_1$.

To analyze the impact of restructuring we consider two regimes. In the first, or the *Routinized Regime*, it is assumed there is no exit or startup of new firms, so that the composition of firms remains constant over time. In the second, or *the Entrepreneurial Regime*, it is assumed that a certain percentage of large-firm employees spins off from their employers and starts new firms (which are small).[3]

In the first regime, which precludes the possibility of startups via large-firm spin-offs, the levels of unemployment in the subsequent two periods can be computed as

(4) $U_2 = L - N_1 s_2 - M r_2 = L - N_1 e^{a} s_1^{1-b} - M e^{a} r_1^{1-b}$ and

(5) $U_3 = L - N_1 s_3 - M r_3 = L - N_1 e^{a} e^{a(1-b)} s_1^{(1-b)^2} - M e^{a} e^{a(1-b)} r_1^{(1-b)^2}$.

In the second, or *Entrepreneurial Regime*, a fraction of workers leave the incumbent large firms to start a new firm. That is, the total number of entrepreneurs increase from N_1 to N_2. These new startups attain the same size as the incumbent small firms (s_1). The unemployment levels in the *Entrepreneurial Regime* are therefore

(4') $U_2' = L - N_2 s_2 - M r_2 = L - N_2 e^{a} s_1^{1-b} - M e^{a} (r_1 - (N_2 - N_1) s_1 / M)^{1-b}$ and

(5') $U_3' = L - N_2 s_3 - M r_3 = L - N_2 e^{a} e^{a(1-b)} s_1^{(1-b)^2} - M e^{a} e^{a(1-b)} (r_1 - (N_2 - N_1) s_1 / M)^{(1-b)^2}$.

The difference in the *change* in unemployment between the *Entrepreneurial Regime* and the *Routinized Regime* is:

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[3] The concepts of the Routinized and Entrepreneurial Regimes correspond somewhat with those introduced by Winter (1984) and operationalized by Audretsch (1995). They are related to what Audretsch and Thurik (2000 and 2001) term the Managed and the Entrepreneurial Economies.

$$(6)\ U_3^{'} - U_2^{'} - (U_3 - U_2) = (N_2 - N_1)e^a (s_1^{1-b} - e^{a(1-b)} s_1^{(1-b)^2}) +$$

$$Me^a \{(r_1 - (N_2 - N_1)s_1 / M)^{1-b} - r_1^{1-b} + e^{a(1-b)} (r_1^{(1-b)^2} - (r_1 - (N_2 - N_1)s_1 / M)^{(1-b)^2})\}.$$

This difference is negative in case of $b > 0$, which suggests that restructuring economic activity away from large enterprises towards smaller firms should result in lower unemployment. In general, the extent to which unemployment increases or decreases depends upon the shift towards smaller enterprises, N_2-N_1, whenever $b \neq 0$. We test this relationship using model equation (7).

3. A Computational Example

It is possible to use some numerical values to see what the size of the effect amounts to. These values are partially based upon 1995 U.S. industrial activity data from *Small Business Growth by Major Industry*, published by the U.S. Small Business Administration. Five million of the total number of enterprises in this data source are classified as small.[4] These small firms have an average size of 10 employees. Of the total number of enterprises, 15,000 are classified as large. The mean size of large firms is 3,000 employees. Hence, we approximate L=100,000,000, s_1=10, r_1=3,000, N_1=5,000,000, M=15,000. The total employment therefore is 95,000,000 resulting in an unemployment rate of 5%.

Now assume that b=0.02 indicating a slow regression-to-the-mean process.[5] We also assume that when a firm reaches a size level of 100 employees, it has reached the minimum efficient scale (MES) level of output, defined as the minimum size level where average cost is at a minimum, or exp(a/b)=100 implying that a=b*ln(100)=0.092. For the Entrepreneurial Regime we assume that there are ten spin-offs per firm, or N_2=5,150,000. The unemployment rates in subsequent periods are given in Table 1.[6] It summarizes the computational values obtained from inserting (approximated) U.S. data into the above model. From Table 1 we find that in both cases the job destruction by large firms is not compensated for by the job creation of small firms. However, the increase in the rate of unemployment in the *Entrepreneurial Regime* is much less than that in the *Routinized Regime*.

Table 1: Some computational values

	U_1	U_2	U_3
Routinized Regime	5%	5.61%	5.92%
Entrepreneurial Regime	5%	5.42%	5.53%

The model based upon the violation of Gibrat's Law is one approach to derive the hypothesis that an increased degree of entrepreneurial activity leads to subsequent decreases in unemployment. Another approach is to argue that new entrants increase the number of participants in markets, and hence decrease market power of monopolists or oligopolists. As a consequence total market output is increased, for which additional labor input is required to achieve this output. In the next two sections we

[4] A small firm is defined by the U.S. Small Business Administration as an enterprise with fewer than 500 employees.

[5] An indication of the value of b may be derived from the results presented in Evans (1987b). For US firms for the period 1976-1982 he has rates ranging from 2% to 7% dependent upon the age group. He has four age groups (0-6, 7-20, 21-45 and 46+ years). Hence, a value of 2% is rather conservative. A higher value would give a stronger difference between the two regimes.

[6] U_2 = 100,000,000 – 52,351,014 – 42,036,368 = 5,612,618,
U_3 = 100,000,000 – 54,762,225 – 39,321,456 = 5,916,319,
U_2' = 100,000,000 – 53,921,544 – 40,662,717 = 5,415,739,
U_3' = 100,000,000 – 56,405,092 – 38,061,805 = 5,533,103.

perform an analysis based on an OECD panel data set to investigate whether these rationales find empirical support.

4. Measurement Issues

The concept of entrepreneurship clearly is a heterogeneous phenomenon that has been broadly interpreted in many different contexts. In this paper we follow the example of Storey (1991) in operationalizing it as the number of self-employed. There are a number of important qualifications that should be emphasized when using and interpreting this measure. First, it lumps all types of a very heterogeneous activity across a broad spectrum of sectors and contexts into a solitary measure. This measure treats all businesses as the same, both high-tech and low-tech. Second, it is not weighted for magnitude or impact. Again, 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 startup 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 measured and can be compared across countries and over time.

The panel data set of unemployment and self-employment rates for the 23 OECD countries over the 1974-1998 period is constructed as follows. For the unemployment data, *U*, we use the standarized unemployment rate of the OECD Main Economic Indicators (2000). The data for self-employment, *E*, are from the Compendia 2000.1 data set of EIM in Zoetermeer, The Netherlands. The Compendia data set uses data from the OECD Labor Force Statistics and other (country-specific) sources to make the self-employment data as comparable as possible across countries. See Carree et al. (2002) for more details about the Compendia 2000.1 dataset.[7] Because our prime focus in the current paper is the effect of entrepreneurship on unemployment we show some data for the six countries (out of 23) with the highest and lowest values of the change in the self-employment rate from 1974 to 1986 in Table 2. Out of six countries with the strongest *increase* in self-employment four show a subsequent decreases in unemployment. There are two exceptions: Italy and New Zealand. Carree et al. (2002) provide evidence that Italy may have a level of self-employment that is already inefficiently high, and that therefore further increases are counter-productive. Out of six countries with the strongest *decrease* in self-employment four show a subsequent increase in unemployment. For one country, Denmark, there is no change in the unemployment rate, while another country, The Netherlands, has a surprisingly large decrease in unemployment given the decrease in the presence of entrepreneurs. The appraised Dutch 'poldermodel' which started basically in 1982 (the 'Wassenaar' treaty) may be an important reason for the huge decrease in unemployment during the late 1980s and the 1990s (Thurik, 1999). The self-employment rate in The Netherlands rose 2.2 percentage points during this period.

[7] Further information about the Compendia 2000.1 data set can be obtained from André van Stel at EIM in Zoetermeer, NL, ast@eim.nl.

Table 2: Ranking of countries with respect to change in self-employment rate (in % points) between 1986 and 1974

	E_{86}-E_{74}	U_{98}-U_{86}
Australia	2.8	-0.1
Canada	2.5	-1.3
Italy	2.3	1.2
USA	2.1	-2.5
UK	1.2	-5.0
New Zealand	1.2	3.5
Norway	-0.8	1.2
France	-1.1	1.6
Austria	-1.5	1.2
the Netherlands	-1.5	-6.2
Denmark	-1.8	0.0
Luxemburg	-2.2	1.2

5. The Model and Empirical Results

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. To test this first hypothesis that an increase in entrepreneurial activity leads to a decrease in subsequent unemployment we estimate the following equation:

$$(7)\ U_{it} - U_{i,t-L} = \alpha + \beta(E_{i,t-L} - E_{i,t-2L}) + \gamma(U_{i,t-L} - U_{i,t-2L}) + \varepsilon_{1it},$$

where *i* is a country-index, *L* is the time span in number of years and the expected sign of the coefficient β is negative. To test the second hypothesis, that the propensity to start a new firm is positively related to increases in unemployment, we estimate

$$(8)\ E_{it} - E_{i,t-L} = \kappa + \lambda(U_{i,t-L} - U_{i,t-2L}) + \mu(E_{i,t-L} - E_{i,t-2L}) + \varepsilon_{2it},$$

where the expected sign of the coefficient λ is positive.

In both equation (7) and (8) the lagged endogenous variable is used on the right hand side to "correct" for reversed causality. [8]

[8] 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. Two-way causation is frequently the case; x Granger causes y and y Granger causes x. It is important to note that the statement "x Granger causes y" does not imply that y is the effect or the result of x. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term.

Using the panel data set consisting of 23 OECD countries between 1974-1998, Equations (7) and (8) are estimated using weighted least squares and the results shown in Tables 3 and 4. The weighting variable is the number of self-employed. The equations are estimated for three different time spans, four years, eight years and twelve years (L is 4, 8 or 12), in order to gain insight in the lag structures between unemployment and entrepreneurship.[9] A longer lag structure of at least eight years is more compelling because the employment impact of entrepreneurship is not instantaneous but rather 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 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 startups in U.S. manufacturing more than doubles as the firms age from two to six years old (no evidence was provided beyond six years).

When a four-year time span is used in Equation (7), the explanatory power is low. However, when the longer time spans of eight and twelve years are used, changes in self-employment are found to reduce subsequent unemployment. This is in line with our expectations. There exists a clear "Schumpeter" effect of entrepreneurship reducing unemployment. The magnitudes of these coefficients are –0.779 and –0.843, respectively.

The negative effect of self-employment on subsequent unemployment is in conformity with the stylized fact that Gibrat's "Law of Proportional Effect" does not hold. The results from estimating Equation (7) 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 firms grow at systematically higher rates than their larger counterparts; thus, countries with a greater increase in entrepreneurial activity also experience systematically higher growth rates.

The evolution of market structure is complex and it is probably not appropriate to expect that simple statistical regularities like the "Law of Proportional Effect" suffice to draw the entire picture (Sutton, 1997, p. 57). The implicit 'failure' of Gibrat's Law may be due to the occurrence of competing products while the newer products are generated by new and small firms following a trial and error process with the consequence that older products 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 previously unnoticed profit opportunities.[10] This may lead to more consumer satisfaction at lower cost, hence to economic growth and lower levels of unemployment. The question now is where do these previously unnoticed profit opportunities come from. The assumption of the present paper is that they are generated by entrepreneurs starting new firms. This assumption 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. See also Holcombe (1998) trying to incorporate entrepreneurship into the framework of economic growth while combining growth theory and Kirzner's view of entrepreneurial contribution and Silos-Labini (1992) pointing at the ossi-

[9] See Madsen (2002, p.162) for an example of sensitivity of Granger causality tests to different lenghts of time spans.

[10] See Yu (1998) for an examination of the role of adaptive entrepreneurship and its role in the dynamics of Hong Kong's economy. Also, a description is provided of Kirznerian adaptive entrepreneurship, Leibenstein's routine entrepreneurship, Baumol's imitative entrepreneurship and Schumpeter's creative entrepreneurship.

fication of centrally planned economies where the role of small firms alone is restricted as well as their synergistic influence on larger ones.

Table 4 shows that changes in unemployment have a positive impact on subsequent self-employment for all three time periods. 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" or "shopkeeper" effect of unemployment stimulating entrepreneurship. The results here indicate that this positive impact is larger when longer time lags are incorporated.

Table 3: Determining the change in rate of unemployment, $U_t - U_{t-L}$ using equation (7)

	lag structure			
	L	4 years	8 years	12 years
Constant	α	0.005 (2.0)	0.004 (1.0)	0.008 (0.9)
$E_{t-L} - E_{t-2L}$	β	-0.312 (1.0)	-0.779 (2.6)	-0.843 (2.1)
$U_{t-L} - U_{t-2L}$	γ	-0.197 (2.1)	-0.182 (2.1)	-0.176 (1.4)
R-squared		0.04	0.22	0.28
Observations		115	46	23

Note: Absolute t-values are between brackets. The results are from a weighted least squares regression with the weighting variable as the number of self-employed lagged by eight years.

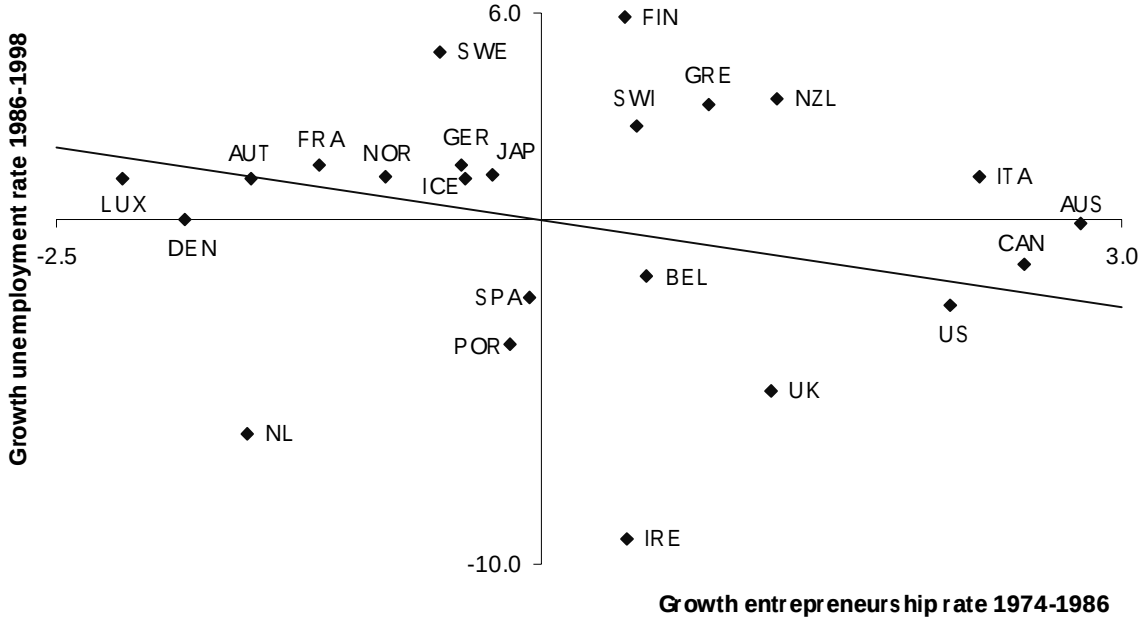
Table 4: Determining the change in rate of self-employment, $E_t - E_{t-L}$ using equation (8)

	lag structure			
	L	4 years	8 years	12 years
Constant	κ	-0.000 (0.4)	-0.004 (2.1)	-0.015 (2.5)
$U_{t-L} - U_{t-2L}$	λ	0.057 (2.4)	0.141 (3.8)	0.248 (3.1)
$E_{t-L} - E_{t-2L}$	μ	0.534 (6.7)	0.564 (4.2)	0.613 (2.4)
R-squared		0.28	0.39	0.38
Observations		115	46	23

Note: Absolute t-values are between brackets. The results are from a weighted least squares regression with the weighting variable as the number of self-employed lagged by eight years.

Figure 1 shows that those countries exhibiting a greater increase in entrepreneurship rates between 1974 and 1986 also tended to exhibit greater decreases in unemployment rates between 1986 and 1998. This would suggest a negative relationship between entrepreneurial activity and subsequent unemployment.

Figure 1: Changes in entrepreneurship and unemployment rates in OECD countries



6. Conclusions

A large literature trying to ascertain the relationship between unemployment and entrepreneurship has produced ambiguous results at best. While some studies find a positive link between unemployment and entrepreneurship (the "refugee" effect), still others find evidence supporting a negative relationship (the "Schumpeter" effect). This study has attempted 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 entrepreneurship. At the same time, changes in entrepreneurship have a negative impact on subsequent unemployment. Because these are essentially dynamic inter-temporal relationships, previous studies estimating contemporaneous relationships have confounded what are essentially two relationships each working in the opposite (dynamic) direction.

The small business sector, and hence business ownership, is of considerable importance in the U.S.[11] and other OECD economies (White, 1982; Audretsch, 1995; Kwoka and White, 2001). New and small firms are a major vehicle in which entrepreneurship thrives (Wennekers and Thurik, 1999). The present paper shows the importance of the role that entrepreneurship can play in bringing down unemployment. Levels of entrepreneurship and unemployment differ considerably across countries. So does the public policy approach of different countries nurturing and sustaining entrepreneurial activities.[12]

[11] See Picot, Manser and Lin (1998) for a comparison of the role of self-employment in job creation between Canada and The U.S.

[12] See Reynolds et al. (2000, p.6) for an example of the wide range of public policy approaches of various countries. See Pfeiffer and Reize (2000b) and Audretsch and Thurik (2001) for more policy issues.

This paper has identified the existence of two distinct and separate relationships between unemployment and entrepreneurship in the context of the developed countries represented by the OECD. Future research needs to explicitly address whether these relationships also hold in other contexts, such as in developing countries.

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