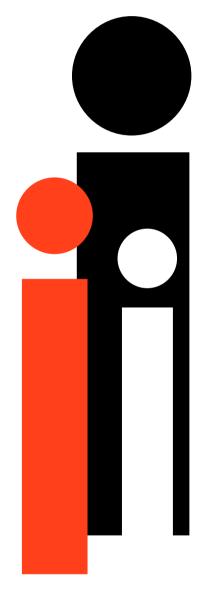# Self-employment flows and persistence: A European comparative analysis

Mark Taylor
Institute for Social and Economic Research
University of Essex

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Non-technical summary

Movement into and out of jobs and between different forms of work have become increasingly prominent features of the labour market in many European countries. This reflects the needs of firms to adapt quickly to rapidly changing market conditions and technological progress, and the common interest across the EU in creating greater adaptability within the labour market as part of the drive towards increasing competitiveness and boosting job creation. For employers the key aspect of labour market flexibility is the ability to swiftly change the number of workers they employ or the number of hours workers provide in response to either cyclical or unexpected fluctuations in demand – this can be done through fixed term or time-limited contracts, subcontracting, dismissals or redundancies. We focus on one particular form of flexible work, self-employment. We identify patterns of self-employment entry, exit and persistence in a sample of EU countries and examine the different factors that explain individuals' self-employment experiences within and between countries.

It is important for policy makers in Europe to understand the factors that influence occupational choice, and whether these are susceptible to policy measures. We provide a link between previous cross-sectional comparative work at the individual level and aggregate time-series studies by using a single cross-national panel data set and various estimation techniques. We focus on the experiences of workers in a number of EU countries – Britain, France, Germany, Greece, Ireland, Italy, Portugal and Spain. These countries were chosen for reasons relating to data availability and sample sizes and their levels of employment protection legislation. Britain and Ireland have low levels of employment protection legislation, while Spain, Italy, Greece and Portugal have high levels. That in Germany and France is between these two extremes.

Our analysis identifies both similarities as well as significant cross-national variation in factors associated with self-employment flows and persistence. Labour markets in Greece, Italy and Portugal are most conducive to self-employment entry, while those in France and Germany are least conducive. Men in Germany have characteristics associated with a higher propensity to enter self-employment and those in Portugal have characteristics associated with a lower propensity to enter self-employment. The relatively high predicted probabilities of leaving self-employment in Spain can be explained by the way labour market operates rather than the characteristics of men in Spain. The labour markets in Greece and Portugal also appear to be less conducive to self-employment survival, but the characteristics of men in these countries mediate this. We also find high degrees of persistence in self-employment across countries, which vary with age, home ownership and recent unemployment experiences.

Our results suggest that policies aimed at moving individuals into self-employment can only be temporary solutions – and further support is required once self-employed to prevent exits. The apparent scarring impacts of unemployment on self-employment indicate that policies targeted at reducing the incidence of unemployment in the short-run have beneficial longer run effects on self-employment persistence and survival, but also reduce entry rates into self-employment. Employment instability and turnover, and the higher associated risks of unemployment, increase the likelihood of self-employment entry, but also self-employment exits. The fact that formal qualifications has little impact on self-employment flows, while age has a consistent impact, suggests that education and training schemes should be focused more on skills typically acquired with experience and improving worker's social capital rather than qualification accumulation.

Self-employment flows and persistence: A European comparative analysis

Mark Taylor
(taylm@essex.ac.uk)
Institute for Social and Economic Research
University of Essex
Colchester
Essex, UK
CO4 3SQ

Abstract: We identify patterns of self-employment entry, exit and survival in a sample of EU countries and examine factors that explain individuals' self-employment experiences within and between countries. We estimate a range of models, including dynamic random effects models that endogenise the initial condition. Our results highlight similarities and differences between countries, and illustrate the importance of age and previous labour market experiences in determining self-employment flows. We also find a high degree of persistence in self-employment across countries, which is most pronounced in France and Germany and least pronounced in Spain. Our results suggest that flows into self-employment are positively associated with the strictness of employment protection legislation.

1. Introduction

Movement into and out of jobs and between different forms of work have become increasingly prominent features of the labour market in many European countries. This reflects the needs of firms to adapt quickly to rapidly changing market conditions and technological progress, and the common interest across the EU in creating greater adaptability within the labour market as part of the drive towards increasing competitiveness and boosting job creation. From an employer's point of view the key aspect of labour market flexibility is the ability to swiftly change the number of workers they employ or the number of hours workers provide in response to either cyclical or unexpected fluctuations in demand – this can be done through fixed term or time-limited contracts, subcontracting, dismissals or redundancies. In this paper, we focus on one particular form of flexible work, self-employment. We identify patterns of self-employment entry, exit and persistence in a sample of EU countries and examine the different factors that explain individuals' self-employment experiences within and between countries.

Many European countries have introduced policies promoting self-employment and aiding small business start-up, which may not only be a source of labour market flexibility but is also seen as an important route out of unemployment and into work, and of job creation, innovation, invention and competition. Governments have increased their efforts to foster self-employment by addressing barriers to entry such as overly complex or expensive procedures for setting up companies, or easier access to finance, training and networks of contacts (Bendick and Egan 1987; Parker 2004). Some of these policies provide payments to the unemployed to help start a business, others provide loans or exempt small businesses from particular regulations or taxes, while others offer training or technical help to new entrepreneurs (OECD 2000 provides a summary relevant to the time period under consideration in this paper). In recent years, self-employment has been a significant source of job growth in many OECD countries, while in some countries (such as Germany) it has grown considerably faster than paid employment. Self-employment is now a major source of work within the EU-15 countries. In 2007 for example, more than twenty five million workers in these countries were in self-employment, more than double the number that were unemployed (EC 2008).

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The self-employment rate across the EU as a whole has remained relatively stable since the early 1990s at around 15%, but differences in self-employment rates in the EU persist (see Table 1). Country specific rates have varied from 20% or higher in Ireland, Portugal, Greece and Italy to below 12% in France and Germany. Table 1 indicates that there is no evidence of convergence in self-employment rates over time, with differences in rates between countries remaining large (see also, for example, Parker and Robson 2004; EC 2008). Furthermore, differences between countries remain even when controlling for the importance of agriculture, labour demand, and basic demographic characteristics (Blanchflower 2000). As well as differences in self-employment rates, evidence suggests that preferences for self-employment vary significantly across EU countries (Blanchflower et al 2001).

Despite these large and persistent differences, comparative research into self-employment is rare, and most analyses of variations in self-employment in the EU use aggregate time series data. There has been little comparative work investigating self-employment transitions across Europe at the micro-level – maybe because of the lack of standardisation in data collection methods. Individual patterns of labour market experiences are also likely to be heavily influenced by a wide range of individual and structural factors and a variety of institutional arrangements exist within Europe making direct comparisons complicated. Rather than focussing on the individual's decision to become self-employed (which is the key factor determining aggregate self-employment rates) existing studies explain differences in self-employment rates across countries. For example, Parker and Robson (2004) show that self-employment rates in OECD countries are positively related to average income tax rates and negatively related to benefit replacement rates. Staber and Bogenhold (1993) find a positive relationship between self-employment and unemployment rates in OECD countries, while Blanchflower (2000) finds a negative relationship.

An exception is OECD (2000) which uses European individual-level data and finds that most self-employment entries are from paid employment while most exits are into paid employment or inactivity. Only a very small proportion of unemployed find work through self-employment. Stability in self-employment is generally lower than in paid employment (OECD 2000). However these findings were based on retrospective data

which the authors acknowledge as being subject to large reporting errors and only suitable for indicating broad trends over time. More recently, research by Román et al (2011) suggests that employment protection legislation, the business cycle and active labour market policies are important factors in motivating false self-employment – that is people registering as self-employed as a means of bypassing regulatory legislation but who essentially work as an employee. Other recent research suggests that expenditure on business start-up subsidies reduces exit rates from self-employment across Europe, particularly among those who enter self-employment from unemployment (Millán et al 2011).

Country specific studies suggest that many self-employment ventures are quickly terminated – Cressy (1996) finds that 38% of a random sample of small businesses started in Britain in 1988 were still surviving in 1992. Taylor (1999) and Meager and Bates (2004) find that less than 50% of self-employment ventures started in Britain survive their first two years in business, while studies of self-employment in Germany, Italy and France show that 25% exit within twelve months (Lohman and Luber 2004; Amossé and Goux 2004; Barbieri and Bison 2004). German and Dutch evidence also suggests that of the self-employed receiving state support for starting their businesses, 70% were self-employed three years later (OECD 1996). Fuest et al (2002) report that according to OECD data, between 30–50% of new firms survive for seven years, with the highest survival rates in France and Portugal and the lowest in Britain. This evidence suggests that although it is typically argued that job creation rates are higher among small firms, job destruction rates are also higher (Davis et al 1996). However, for many, self-employment is a transitory state between spells of paid employment – Taylor (1999), for example, reports than almost one half of exits from self-employment in Britain were to another job. Nevertheless panel data indicates considerable persistence in self-employment at the individual, regional and even national levels in Britain, Germany, Spain and a range of other OECD countries (Henley 2004; Fritsch and Mueller 2007; Parker and Robson 2004; Bruce and Mohsin 2006; Caliendo and Uhlendorf 2008; Congregado et al 2009).

In this paper, we examine the individual and household characteristics that determine self-employment. It is important for policy makers in Europe to understand the factors that influence occupational choice, and whether these are susceptible to policy

measures. We study the flows of workers into and out of self-employment, and examine the different factors that explain individuals' behaviour within and between countries. We provide a link between previous cross-sectional comparative work at the individual level and aggregate time-series studies by using a single cross-national panel data set and various estimation techniques. We focus on the experiences of workers in a number of EU countries – Britain, France, Germany, Greece, Ireland, Italy, Portugal and Spain. These countries were chosen for reasons relating to data availability and sample sizes and their levels of employment protection legislation. Britain and Ireland have low levels of employment protection legislation, while Spain, Italy, Greece and Portugal have high levels. That in Germany and France is between these two extremes.

Our analysis identifies both commonalities as well as significant cross-national variation in the factors associated with self-employment flows and persistence. Our cross-country comparison indicates that labour markets in Greece, Italy and Portugal are most conducive to self-employment entry, while those in France and Germany are least conducive. Men in Germany have characteristics associated with a higher propensity to enter self-employment and those in Portugal have characteristics associated with a lower propensity to enter self-employment. We find that the relatively high predicted probabilities of leaving self-employment in Spain can be explained by the way labour market operates rather than the characteristics of men in Spain. The labour markets in Greece and Portugal also appear to be less conducive to self-employment survival, but the characteristics of men in these countries mediate this. We also find a high degree of (causal) persistence in self-employment across countries, which is most pronounced in France and Germany and least pronounced in Spain. This persistence varies consistently across countries with age, home ownership and recent unemployment experiences.

2. Institutional background

There are a number of issues to consider when studying self-employment, particularly within a comparative framework. Evidence suggests that the proportion of the workforce in self-employment is affected by the stage of economic development and the structure of economy as well as policy and institutional variables that make self-

employment more advantageous relative to dependent employment. For example, there is evidence that the overall self-employment rate increases with the share of agricultural GDP, and falls with GDP per capita. We do not attempt to explain differences in self-employment across regions in terms of policy, or to evaluate the success of country-specific policies directed towards self-employment. Indeed the latter is problematical given that the impacts of such policies may take many years to emerge (Fritsch and Mueller 2007; Carree and Thurik 2008). It is however important to understand the institutional background in the countries we study in order to be able to place our results in context.

The countries we are studying have implemented a variety of policy initiatives to encourage, promote and support the self-employed in a number of different ways. For example, training programmes may help sustain viability of business and avoid unnecessary failure. In 1996, Italy introduced eight week training courses for the self-employed giving vocational guidance and training and technical assistance. More common however, were policies targeting business start-up among the unemployed, which were introduced in all countries we study. Germany introduced a policy in 1986 (reformed in 1994) that provided an allowance equalling UI payments paid for up to six months while the administration assesses the sustainability of the new activity (which has to involve at least 18 hours per week) and ensures that the self-employed individual receives an income of at least two-thirds of the average income of employed persons in a similar job. A policy introduced in Ireland in 1993 offers the unemployed who enter self-employment support for three years at a rate equal to a declining proportion of their previous level of welfare receipt. Italy introduced a subsidised loan in 1996 payable to the unemployed who set up a business in crisis areas (60% of which is non-refundable and 40% a low interest loan to meet capital expenses). Since 1989 the unemployed in Portugal are provided a grant to create their own business. An additional non-refundable grant for planning, setting up and operating business is also provided. In 1993 the British government replaced the Enterprise Allowance Scheme of the early 1980s with a programme that consists of a weekly allowance paid for one year and places more emphasis on business survival. In France the unemployed who enter self-employment received lump sum payments (repayable if business failed within the first 6 months) and since 1997, those starting a

small business have been exempt from social security contributions. A similar policy was introduced in Spain.

In addition to these, countries have also introduced policies targeted especially at young people. For example, in 1996 Italy introduced monetary subsidies and technical support during the initial years of self-employment activity for those aged under 36 years of age and who started a business in the agriculture, crafts, or manufacturing sectors in areas supported by EU funds. Portugal introduced a policy in 1995 providing young persons aged 18–25 with a non-refundable installation grant after completing a training course of six weeks in organisation and management. More recently in 1999, the British government introduced a policy targeting young people aged 18–24 in which participants get information and training to produce a business plan.

The countries we focus on also differ considerably in the extent of employment protection which can operate through a range of institutional arrangements such as labour legislation, and legislative and contractual provisions. We might expect the level of employment protection legislation (EPL) to affect self-employment in a number of ways. For example, advance notice of redundancy or layoff may give workers the time to organise and plan a new business, while redundancy payments may provide the financial capital necessary to start an enterprise. Stable and long lasting employment relationships could also reduce the incentive for self-employment among employed workers but at the same time may increase training opportunities and therefore provide workers with the skills necessary to start a new business. High levels of EPL may also increase the risk of long-term unemployment for those who do lose their jobs, which may push workers into self-employment. High levels of EPL may also infer greater administrative burdens on business owners, discouraging workers from setting up small businesses. Alternatively, it may encourage the use of consultants and franchising. Evidence at the aggregate level is mixed. Some suggest that in the service sector, high levels of EPL are associated with greater self-employment (Nicoletti et al 2001) – although the extent to which such self-employment is real is debateable (Román et al 2011) – while others find that once suitable controls are introduced stricter EPL may actually reduce self-employment (Robson 2003). However, high levels of EPL are associated with lower

unemployment inflows and outflows (Gregg and Manning 1997; Boeri 1999; OECD 1998).

The OECD provides a summary measure of overall EPL based on twenty two indicators which cover the period to which our data relate (Grubb and Wells 1993; OECD 1994; OECD 1999; OECD 2004). We summarise this by country and year in Table 2. The indicators used to develop this measure cover three different aspects of employment protection. Twelve of these indicators relate to dismissal regulation for permanent workers, six refer to the regulation of fixed-term contract and temporary agency work, and four relate to the extent to which the requirements for employers exceed those in place for individual dismissals (e.g. in terms of notifying employee representatives or compensation plans etc).[1] Based on the resulting index, Table 2 shows that of the countries in our sample, Great Britain has the least protective employment protection legislation followed by Ireland, while the Southern European countries – particularly Portugal, Greece and Spain – have the most protective employment protection legislation. This index has a correlation coefficient with the self-employment rates shown in Table 1 of 0.32, indicating that higher levels of employment protection are positively correlated with self-employment rates. We place our results within the context of this summary measure of EPL.

3. Data

The critical theme of this study relates to labour market dynamics. Therefore the use of panel data and panel data methods are crucial in addressing the issues of interest. Our research uses data from all eight waves of the ECHP covering the period 1994–2001, released as the user database (UDB) and which permit the study of changes at the micro-economic level. The ECHP is a large scale comparative survey in which the same individuals, residing in private households, are interviewed in consecutive years with interviews approximately one year apart. The survey was originally designed to contribute to the development of comparable statistics on living conditions, income and other social indicators at both the household and individual level. These data were collected annually in a standardised format. At the first wave of interviews in 1994, data were collected in twelve EU member states: Germany, Denmark, the

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[1] Slinger (2001) provides a summary of this index.

Netherlands, Belgium, Luxembourg, France, Britain, Ireland, Italy, Greece, Spain and Portugal. Coverage was extended to Austria in the second wave in 1995, Finland at the third wave in 1996 and Sweden at the fourth wave in 1997. From these data, we analyse self-employment dynamics in eight countries – Britain, France, Germany, Greece, Ireland, Italy, Spain and Portugal. We focus on these countries because (i) the relevant data cover all eight years of the survey (ii) the sample sizes of the self-employed are sufficient for robust analysis and (iii) they represent the full range of employment protection legislation in practice in Europe over the sample period.

Although dated, these data serve our purposes well. The ECHP survey was especially designed to contribute to the development of social indicators relating to the living conditions of both individuals and households, and therefore covers a wide range of topics such as labour market activity, income, health, education, housing and demographic characteristics. The original sample in 1994 consisted of over 60,000 nationally representative households containing approximately 130,000 adults (aged 16 and above) (Eurostat, 2000). They are micro-data, allowing us to control for individual, area and country effects in estimation procedures. As panel data they trace the same individuals over time, allowing us to control for changes in individual and household circumstances, and for unobserved individual-specific effects. Furthermore the standardisation of these data facilitates cross-country comparisons.[2]

A common problem in empirical analysis is identifying and defining the self-employed. In economic terms, the self-employed can be distinguished from employees by their mode of remuneration. They do not receive a wage but instead receive a return on their input of capital, entrepreneurial skill and risk taking as well as on their labour. A standard international definition is that the self-employed are those whose remuneration is directly dependent upon profits, and incumbents are responsible for the welfare of the enterprise. However in practice most data on self-employment come from national Labour Force Surveys which ask respondents to classify themselves as employees or self-employed according to their status in the

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[2] Details of the methodology used for the collection of information in the ECHP can be found in Eurostat (1996). For quality related issues, see Eurostat (1999). The average response and attrition rates are comparable to those generally found in other large, complex surveys (Eurostat, 2000). Recent studies using ECHP data for comparative analysis of unemployment experiences include Russell and O'Connell (2001), Azmat et al (2006) and Tatsiramos (2006).

main job. The classification into self-employment in the ECHP is similar, survey respondents are asked to classify their main current economic activity themselves. This definition may result in ambiguity in some cases, and it is possible that some flows into and out of self-employment may not be real but reflect changes in how individuals report a particular activity. However the vast majority of research studying self-employment at the micro-level suffers from this potential measurement error.

Another potential problem in comparative analysis of self-employment involves the role of unpaid family workers and agricultural workers. The role of unpaid family workers is considerably more prevalent in agricultural than non-agricultural sectors, and on average account for 20% of the self-employed in agriculture, compared with 7% in non-agriculture. The ECHP allows us to deal with these problems directly, as unpaid family workers are separately identified in the data (conditional on self-classification), and therefore these are excluded from our analysis. Furthermore, the data allow us to identify the industry and occupation of workers, and therefore agricultural workers in the sample can be identified. We exclude from our estimating sub-sample all individuals working in agricultural or fishery occupations.[3]

From the remaining data we draw an estimating sub-sample for our analyses. In particular we select only men between the ages of 22 and 59. We focus only on men primarily because self-employment is male dominated – for example, in the EU-15 countries, the female self-employment rate (at 10%) is only half that of the male self-employment rate (19%) (EC 2005). Of the countries we study, only in Portugal and Greece do the female self-employment rates approach those of the male rates. Furthermore, a large proportion of the female self-employed tend to be part-time workers. These factors lead to sample size and selection problems if women are considered. We focus on men aged 22 to 59 as such men are most likely to be active in the labour market and therefore at risk of self-employment, and we abstract from potential problems related to occupational choice decisions surrounding schooling and retirement.

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[3] In these data, these occupations account for between 5% of self-employment in Britain to 40% of self-employment in Ireland and Portugal.

Table 3 summarises the non-agricultural self-employment rates among men in the countries in our sample. These rates are generally lower than those summarised in Table 1 for each country (with the exceptions of Britain and Spain), with the largest differences apparent in Greece and Germany. This table indicates that non-agricultural self-employment rates were highest in Greece (averaging 29% over the period), Italy (21%), Portugal (16.6%) and Spain (15.6%). They were lowest in France (7.2%) and Germany (6.9%). These non-agricultural self-employment rates in the ECHP data show a correlation coefficient with the OECD index of EPL of 0.36, indicating a weakly positive correlation. Non-agricultural self-employment rates are higher when employment protection is greater.[4] The final column of Table 3 shows the proportion of men that were ever self-employed over the eight-year sample period, and thus reflects the degree of exposure to self-employment in the short term. One third of men in Greece were exposed to self-employment over the eight year window, compared with one in four in Italy, one in five in Portugal, Spain and Britain, and fewer than one in ten in France and Germany. This proportion relative to the average self-employment rate in the country provides an initial indication of self-employment turnover, and suggests that self-employment is most stable in France and Greece and least stable in Britain and Germany.

Table 4 summarises self-employment dynamics more directly by showing the labour market status at $t+1$ of men who were in self-employment at t. In this table we have grouped together the unemployed and the economically inactive into one category ('out of work') because of relatively small sample sizes in some countries.[5] The table shows that, pooling data from all countries, 90.7% of men who were self-employed at a particular date of interview t were also self-employed at the subsequent date of interview at $t+1$. Persistence in self-employment ranges from 86.7% in Spain to 96% in France. In terms of outflows from self-employment, the data indicate that most workers who leave self-employment between t and $t+1$ were in paid employment at $t+1$. This is consistent with previous research suggesting that a large proportion of self-employment exits are to another job (Taylor 1999, OECD 2000), and that self-employment for many may be a stepping stone into paid employment. Flows from

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[4] Arum and Müller (2004) find that self-employment rates are highest at both low and high extremes of labour market regulation.
[5] However in all countries the vast majority of those out of work are unemployed.

self-employment into non-work states are relatively small. The proportion of the self-employed who enter non-work states between two consecutive years ranges from 1.5% in Portugal to almost 3% in Britain and Spain. In terms of the proportion of men who leave self-employment between two consecutive dates of interview, these figures suggest that fewer than 20% in Portugal leave work altogether compared with more than 30% in Ireland and Italy and 48% in France. The final column of Table 4 shows the year-on-year persistence in paid employment as a comparison. This shows that in Greece and France, self-employment appears to be more stable than paid employment. In contrast self-employment is least stable relative to paid employment in Britain, indicating that self-employment is relatively riskier in Britain compared to other countries.

Table 5 presents inflow rates to self-employment from paid employment and non-work. This indicates that on average 1.9% of men in paid employment and 2.8% of non-employed men entered self-employed each year. Self-employment inflow rates were highest from Southern European countries and also Britain and were lowest in France and Germany. More than 3% of men in paid employment in Greece were in self-employment at the subsequent year, compared with about 2.5% in Italy, Portugal and Spain, 1.8% in Ireland and Britain and less than 1% in France and Germany. Self-employment inflow rates are on average 50% higher from non-work than self-employment. From non-work, they are highest in Greece where 4.1% of non-working men had entered self-employment at the subsequent year. This compares with 3.5% in Britain and Spain, between 2% and 3% in Ireland, Italy and Portugal, and less than 2% in France and Germany. A non-working man in France is four times more likely to enter self-employment than an employed man, in Britain and Germany they are twice as likely, while in Portugal and Italy the chances are about the same. Despite this, the percentages in brackets (indicating the proportion of the self-employed that entered from each state) show that in each country the majority of self-employment entrants are from paid employment.

These descriptive statistics indicate some important differences in self-employment persistence and dynamics between the countries and in the following sections we describe how such dynamics are correlated with a range of individual, household and country specific characteristics.

4. Methods

Thus far we have described self-employment incidence, persistence and transitions between self-employment and other labour market states in the selected countries. But what determines whether men and women enter or leave self-employment within each country? How do these determinants differ across countries? What individual characteristics are associated with a higher (or lower) probability of starting a business? What determines whether or not an individual is in self-employment at a particular point in time? How does persistence in self-employment differ from country to country and what factors affect this persistence? To fully exploit the panel nature of the data and to examine the determinants of entering or leaving self-employment, and the relative persistence in self-employment across countries, we estimate a series of binary choice models. We use a simple utility maximising framework to provide a structure for our analysis.

Probability of entering self-employment

Within our framework, an individual is self-employed at time *t* w if:

$$U_{i,t}^{S} - \max\left\{U_{i,t}^{W}, U_{i,t}^{N}\right\} > 0 \tag{1}$$

where $U_{i,t}^{S}$, $U_{i,t}^{W}$ and $U_{i,t}^{N}$ are the utility flows associated with self-employment, waged employment and non-employment at time *t*. If we denote

$$U_{i,t} = U_{i,t}^{S} - \max\left\{U_{i,t}^{W}, U_{i,t}^{N}\right\}$$

then the probability of entering self-employment between two consecutive time periods can be written:

$$\Pr\left(S_{i,t+1}^{*} > 0 \middle| S_{i,t} = 0\right) = \Pr\left(U_{i,t+1} > 0 \middle| U_{i,t} \le 0\right) \tag{2}$$

where $S_{i,t+1}^{*} > 0$ indicates the individual unobserved propensity to be self-employed in time *t*+1. However these utility flows are not directly observable, and instead we

observe labour market transitions between two annual interviews, and in particular whether or not individuals enter self-employment (i.e., we observed only whether $S_{i,t+1} = 1$ or $S_{i,t+1} = 0$). Therefore we assess the impact of characteristics on the probability of entering self-employment by estimating reduced form equations. For estimation purposes the probability of entering self-employment can be written as:

$$\Pr\left(S_{i,t+1} = 1 \middle| S_{i,t} = 0\right) = \Pr\left(\alpha_1 X_{i,t} + u_{i,t} > 0\right) \qquad [3]$$

where $X_{i,t}$ is a vector of (exogenous) individual and household characteristics capturing tastes and preferences measured at time t, α_1 is a vector of coefficients to be estimated and $u_{i,t}$ is random error. Such a specification can be estimated using a probit model for the probabilities of the observed entry into self-employment, where the dependent variable takes a value one for an individual who is self-employed at $t+1$ but not at t, and zero for those who are not self-employed at either time. However, because we have repeated observations on the same individuals over time, we also allow for time-invariant unobserved effects that may be correlated with both self-employment entry and observable characteristics (for example motivation, ability, attitudes toward risk etc). We do this by decomposing the error terms $u_{i,t}$ as:

$$u_{i,t} = \varepsilon_i + v_{i,t} \qquad [4]$$

where ε_i denotes the individual-specific time-invariant unobservable effects and $v_{i,t}$ is random error. We treat the ε_i as random and use the random effects probit model estimated under the common assumptions that $v_{i,t} \sim IN\left(0, \sigma_v^2\right)$, and $v_{i,t}$ are independent of the observed characteristics.[6] Allowing for such time-invariant unobserved effects in this way may be important if particular individuals have

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[6] Estimation in this framework assumes that the time-invariant unobserved individual-specific effects are independent of the observable characteristics. Correlation between the unobservables and explanatory variables can be incorporated by modeling the individual-specific unobserved effect as a function of the means (or leads and lags) of the time-varying covariates (Mundlak 1978, Chamberlain 1984). However when including these means, in almost all cases we could not reject the null that the coefficients on them were jointly zero (indicating no correlation), and therefore we present the models without these additional regressors.

personality or psychological traits that predispose them to self-employment. Examples of such traits include the need for achievement, a high internal locus of control or an above average propensity to take risks (Parker 2004).

Probability of leaving self-employment

Within our framework, the probability of leaving self-employment can be expressed in an analogous way.

$$\Pr\left(S^*_{i,t+1} = 0 \middle| S_{i,t} = 1\right) = \Pr\left(U_{i,t+1} \leq 0 \middle| U_{i,t} > 0\right) \qquad [5]$$

where $S^*_{i,t+1} = 0$ indicates the individual unobserved propensity to be in a labour market status other than self-employment at $t+1$. Again instead of directly observing utility flows, we observe whether or not individuals leave self-employment between two consecutive years. Therefore we assess the impact of characteristics on the probability of leaving self-employment by estimating reduced form equations. For estimation purposes the probability of leaving self-employment can be written as:

$$\Pr\left(S_{i,t+1} = 0 \middle| S_{i,t} = 1\right) = \Pr\left(\alpha_2 Z_{i,t} + \varepsilon_i + v_{i,t} > 0\right) \qquad [6]$$

where $Z_{i,t}$ is a vector of (exogeous) individual and household characteristics capturing tastes and preferences measured at time t, and α_2 is a vector of coefficients to be estimated. Again we treat the ε_i as random and use the random effects probit model estimated under the common assumptions that $v_{i,t} \sim IN\left(0, \sigma_v^2\right)$, and $v_{i,t}$ are independent of the observed characteristics. Allowing for these individual-specific effects is important if men differ in unobserved ways in their ability to, for example, manage their finances or successfully run a business. In this case the dependent variable takes a value of one for an individual who is self-employed at t but not at $t+1$, and zero for those who are self-employed at both times.

Persistence in self-employment

To examine the relative persistence in self-employment across countries, we estimate dynamic binary choice models of employment status, based on the same framework as the previous transition models. We are interested in identifying the true causal

relationship between being self-employed in one period and self-employment status in the subsequent period. The probability of individual i to be in self-employment at the interview date at time t is specified as:

$$\Pr\left(S^{*}_{i,t} > 0\right) = \Pr\left(U_{i,t} > 0\right) \qquad [7]$$

where S^{*} denotes the unobservable individual propensity to be self-employed. We do not observe these utility flows, but instead observe individuals choices of occupational sector, and for estimation purposes the probability of being self-employed at t is:

$$\Pr\left(S_{i,t} = 1\right) = \Pr\left(\beta x_{i,t} + \gamma S_{i,t-1} + \varepsilon_i + v_{it} > 0\right) \qquad [8]$$

where S denotes the observed status in self-employment, x is a vector of strictly exogenous observable characteristics that influence S, β is the vector of coefficients associated with x. We model the observed employment status of the individual at time t as a function of his status in the previous period, $S_{i,t-1}$, and therefore examine the degree of persistence in self-employment in each country. A spurious correlation between past and present self-employment may emerge because of inadequate controls for individual characteristics correlated with individuals' propensities to experience self-employment (Heckman 1981a). Again we control for both observable and unobservable individual characteristics by treating the ε as random and using the random effects probit model. This is estimated under the common assumption that $v_{i,t} \sim IN\left(0, \sigma_v^2\right)$. In this specification, we allow correlation between the unobservables and explanatory variables by assuming that the regression function of ε_i is linear in the means of the time varying covariates in x (Mundlak 1978; Chamberlain 1984). We might expect to be important in the current context if, for example, a man's unobserved ability, motivation or attitudes towards risk are correlated with his education, family formation patterns or recent labour market history. Indeed our estimates reflect the importance of allowing for these correlations. We write this as:

$$\varepsilon_i = b_0 + b_1 \overline{x}_i + b_i \qquad [9]$$

where $b_i \sim IN\left(0, \sigma_b^2\right)$ and is independent of the x and v for all i and t and $\bar{x}_i$ refers to the vector of means of time-varying covariates for individual i over time. Therefore the equation to be estimated can now be written:

$$\Pr\left(S_{i,t} = 1\right) = \Pr\left(\beta x_{i,t} + \gamma S_{i,t-1} + b_1 \bar{x}_i + b_i + v_{i,t} > 0\right) \qquad [10]$$

An additional problem encountered is disentangling the effects of unobserved heterogeneity and true persistence in the variable of interest concerns the initial conditions (Heckman 1981b). This occurs if the initial observation for an individual S_{i1} is correlated with the unobservable b_i. It arises because the start of the observation period does not coincide with the start of the process generating an individual's self-employment experiences, and a large proportion of men in the sample have been at risk of self-employment prior to their first ECHP interview. Therefore a man in self-employment when first interviewed may be there because of his past self-employment experiences or because of some observed and/or unobserved characteristics affecting his self-employment propensity. We follow Wooldridge (2005) and specify an approximation for the probability of b_i conditional on the initial observation:

$$b_i = \eta_0 + \eta_1 S_{i,1} + \eta_2 D_i + d_i \qquad [11]$$

where D_i includes variables correlated with the unobservable b_i. In this way the correlation between the initial observation $S_{i,1}$ and the unobserved effect b_i is allowed for, yielding an individual-specific error term (d_i) that is uncorrelated with the initial observation. By using the means over time of the time-varying covariates ($\bar{x}_i$) as D_i the model to be estimated becomes:

$$\Pr\left(S_{i,t} = 1\right) = \Pr\left(\beta x_{i,t} + \gamma S_{i,t-1} + b_1 \bar{x}_i + \eta_1 S_{i,1} + d_i + v_{i,t} > 0\right) \qquad [12]$$

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This can be straightforwardly estimated using the random effects probit model under the common assumptions that $v_{i,t} \sim IN(0, \sigma_v^2)$, and $v_{i,t}$ are independent of the observed characteristics.[7]

5. Results

Self-employment entry

Initially we focus on factors associated with entering self-employment between two consecutive ECHP interviews, about one year apart. The estimates from the random effects probit specifications are presented in Table 6. We estimate country-specific models and a model with data for all countries pooled together. Although the coefficients on the latter will be biased by differences in cell sizes across country-specific samples, they provide an initial indication of cross-country differences in self-employment entry controlling for compositional effects.

We begin our discussion of the estimates by noting the importance of unobserved individual effects (which in this model is given by rho). The unobserved individual-specific effect accounts for between 53% and 65% of the unexplained variance of the composite error – time-invariant unobserved differences between men are important in explaining the self-employment entry decision.

The estimates from the pooled model indicate that the probability of entering self-employment is higher at younger ages. In particular men below 45 years of age are more likely than those aged 45 or above to enter self-employment between two consecutive years. Age is included to capture labour market experience, and so we might expect older workers who have accumulated experience, contacts, occupation-specific human capital and knowledge of markets to be more likely to enter self-employment (Parker 2004; Cowling and Taylor 2001). However age may also be correlated with attitudes to risk and other attitudes to self-employment and aspects of the working experience, and older people may be less likely to take on the risks and responsibilities associated with self-employment while younger people are less risk

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[7] Arulampalam and Stewart (2009) compare results from estimating a number of different methods of incorporating unobserved heterogeneity and initial conditions, following Heckman (1981a,b) and the approximations of Orme (1997, 2002) and Wooldridge (2005). They conclude that once correlated random effects are allowed for using the approach of Mundlak (1978), the three estimators yield similar results (except when the number of time periods is very small).

averse (Miller 1984). Men aged less than 45 have a higher probability of self-employment entry than those aged 45 and above in Germany, Italy and Spain, while the coefficients on the aged under 30 variable are non-negative in all countries.[8]

Household composition and structure may affect occupational choice in different ways. Dependent children may inhibit self-employment as they redirect both financial and other resources away from a business and may also increase risk aversion among parents. However marriage and large households may also bring social and human capital that supports small business formation. The estimates in Table 6 indicate that marriage and dependent children are associated with a higher probability of self-employment entry, consistent with much previous literature (Bernhardt 1994; Laferrère and McEntee 1995; Blanchflower and Oswald 1998; Blanchflower 2000). A statistically significant association with marriage emerges in Ireland and Portugal while having dependent children significantly increases the probability of self-employment entry in France, Germany and Italy (although the coefficients are generally non-negative).[9]

The impact of formal human capital is on average positive if relatively weak.[10] This is consistent with Lucas (1978) who argues that education enhances people's ability and skills and therefore makes self-employment more attractive and viable. However in the country specific models this pattern emerges only in Italy (and the coefficient for Germany is positive and statistically significant at the 10% level).[11] In Greece having medium levels of education reduce the probability of self-employment entry, which might suggest a different type of self-employment in Greece relative to other countries, or that formal human capital is less important for entrepreneurs in Greece

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[8] Carrasco (1999) and Glocker, and Steiner (2007) report similar country-specific results for Spain and Germany.

[9] Georgellis et al (2005) conclude that marriage and the number or presence of children generally have non-negative impacts on self-employment entry in country-specific studies.

[10] We identify broad educational groups to maintain comparability across countries using the International Standard Classification of Education (ISCED). Here, 'high' levels of education refers to ISCED level 5 or above (a university level qualification) and 'medium' refers to ISCED level 3 and 4 (secondary or post-secondary education). The omitted category is 'low', which refers to ISCED level 1–3 (basic, primary or lower secondary education).

[11] Luber et al (2000) and Lohman and Luber (2004) also document the importance of education on the probability of self-employment entry in Germany. Blanchflower (2000) reports a generally positive relationship between educational attainment and self-employment in 19 OECD countries.

and practical skills and contacts are more important (see for example Lentz and Laband 1990).

We include home-ownership in the models to capture indirectly both access to financial markets and credit together with assets and wealth.[12] There is much evidence suggesting that access to credit is a binding constraint on self-employment entry in a number of countries (see, among others, Blanchflower and Oswald 1998; Holtz-Eakin et al 1994; Lindh and Ohlsson 1996; Burke et al 2000; Taylor 2001). However our estimates suggest that home-ownership is generally not associated with self-employment entry. Having a limiting health condition may restrict the type or amount of work possible which may reduce the feasibility of self-employment, but may also increase the incentive to enter self-employment to overcome potentially lower job offer arrival rates from employers. Estimates in Table 6 indicate that such a health condition reduces the probability of self-employment entry both on average and in Britain, France, Greece, Italy and Spain – and the estimated coefficient is negative in all countries except Portugal (Taylor 2001; 2004 report a similar health effect for Britain).

The next two variables focus on the qualities of the job for those that were in paid employment at *t*, and indicate whether or not the job was permanent or in a professional occupation. In all countries we find that employees in permanent jobs are less likely than those in non-permanent employment to enter self-employment (only in Germany is the coefficient not statistically significant). Therefore men who can expect a more stable employment trajectory are less likely to enter self-employment. In Greece, we find men in professional occupations are less likely to enter self-employment than those in other occupations, although generally occupational status has little impact on self-employment entry.

The subsequent four variables focus on labour market factors, relating to both the individual and the country, age and gender-specific unemployment rate.[13] The two relevant hypotheses here relate to whether individuals are pushed into self-

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[12] Evans and Jovanovic (1989) develop a model where entrepreneurs can only borrow up to a multiple of their initial assets.
[13] These are taken from EC (2005, 2008).

employment through a lack of alternative job offers or whether they are attracted into self-employment by the pecuniary and non-pecuniary returns that it offers. A consistent result across all countries is that self-employment entry rates are higher from unemployment than from paid employment.[14] The estimated coefficients on being unemployed at t are positive and statistically significant in all countries except Greece, Ireland and Portugal. Furthermore, there is evidence that experiencing unemployment in the previous five years also increases the probability of self-employment – the coefficient is positive in all but one country and is statistically significant in Ireland, Italy and Portugal. This is consistent with the unemployment push hypothesis found in previous studies (e.g. Evans and Leighton 1989; Lin et al 2000). However, the country, age and gender-specific unemployment rate reduces the probability of self-employment entry – the coefficient is negative in all countries and statistically significant in Ireland, Greece, Italy and Spain. Therefore individual unemployment experiences increase self-employment entry while higher levels of unemployment in the economy reduce it.[15] Employees are less willing to enter self-employment in periods of low labour demand, all else equal (see also Blanchflower and Oswald 1998; Lin et al 2000; Parker 1996). In contrast, economic inactivity is a more absorbing state, reducing the probability of self-employment entry relative to being in paid employment both on average and in Greece, Italy and Portugal, although increasing it in France.

We have also included an interaction term between the unemployment rate and whether or not the man was employed in a professional occupation at t. We might expect that the impact of local labour demand to be different for less skilled workers (who may be pushed into self-employment) than high skilled workers (who may be pulled into self-employment). In Britain there is some evidence of this, the negative and statistically significant coefficient indicates that professional workers are more likely to enter self-employment when the unemployment rate is low. However the opposite is true in Greece.

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[14] See also Lohman and Luber (2004) for Germany, Amossé and Goux (2004) for France, Carresco (1999) for Spain, and Taylor (2001, 2004) and Meager and Bates (2004) for Britain.

[15] We also examined whether the impact of personal unemployment on self-employment entry varies according to labour demand by including an interaction term between being unemployed at t and the unemployment rate. Only in Ireland was this statistically significant, indicating that the unemployed were more likely to enter self-employment when labour demand was low.

The country indicators in the pooled specification indicate that the probability of self-employment entry is higher in the Southern European countries – Greece, Italy, Portugal and Spain – than in Britain, but lower in France and Germany. This is also shown in Table 7, which presents the year and country-specific predicted probabilities of entering self-employment, calculated from the country-specific models.[16] This indicates that the highest probability of entering self-employment is in Greece (where on average 4.4% of those not in self-employment are predicted to enter self-employment each year), followed by Italy (3.6%), Spain (3.6%) and Portugal (3.2%). It is lowest in France (0.6%) and Germany (1.3%). These predicted probabilities of self-employment entry have a correlation with the EPL index of 0.23, indicating a weakly positive association – self-employment entry is positively (if weakly) associated with the strictness of EPL (see also Román et al, 2011).[17]

However what drives these cross-country differences in the probability of entering self-employment? Are they caused by differences in the characteristics of people across countries? Or instead are they caused by differences in the drivers of self-employment entry across countries? To help answer this, we take the average characteristics of men in each country to estimate their predicted probability of entering self-employment using the estimated coefficients from each other country.[18] The results from this exercise are presented in Table 8. Here the columns refer to using the estimated coefficients from each country and therefore indicate the extent to which the returns to characteristics in each country make self-employment entry more or less likely. The rows refer to using the characteristics from each country and indicate the extent to which it is the characteristics of individuals within each country that make self-employment entry more or less likely.

The results from this exercise suggest that on average the returns to characteristics make self-employment entry most likely in Greece, Italy and Portugal – estimated

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[16] In these and subsequent predicted probabilities and marginal effects, we average across the distribution of the unobserved individual-specific term, as in Wooldridge (2005).

[17] The probabilities in France are very low relative to those in other countries, and this could be biasing the correlation with EPL tightness. Removing the numbers for France leads to a correlation of 0.49 – suggesting a stronger positive correlation between strictness of EPL and self-employment entry.

[18] We retain the unemployment rate in the host nation, and therefore assume that individuals face the prevailing unemployment rate in each country (and that the unemployment rate is a country-specific variable rather than an individual-specific variable).

probabilities of entering self-employment are consistently higher when using coefficients for these countries than for others. Therefore labour market settings, institutions and operation in those countries appear most suited to initiating entrepreneurial activity. In contrast, the returns to characteristics in France and Germany on average make self-employment entry least likely in these countries. The estimated probabilities for entering self-employment are consistently lower when using coefficients from these countries than from others. Thus the way the labour market operates in these countries is less conducive to entrepreneurial activity. In contrast, Table 8 suggests that men in Spain and Germany have (observed and unobserved) characteristics that make them most likely to enter self-employment. The predicted probabilities of entering self-employment are consistently higher when using the characteristics of men from these two countries. Hence Germany appears to have the institutions least conducive to entrepreneurial activity but men with (observed and unobserved) characteristics that make them among the most likely to enter self-employment.[19] In contrast, Portugal has the institutions most conducive to self-employment but men with unobserved and observed characteristics that make them among the least likely to enter self-employment – self-employment entry rates are on average lower when using the characteristics of men from Portugal.

Self-employment exit

Table 9 presents the estimates from random effects probit models where the dependent variable takes the value one if a self-employed worker at t was no longer in self-employment at $t+1$, and zero if they were again self-employed at $t+1$ (equation [6]). Again we estimate a model pooling the data from all eight countries as well as country-specific models. In these, estimates for rho (the proportion of the unexplained variance that can be attributed to the unobserved individual-specific effect) vary from 19.6% in Ireland to 50.9% in Portugal. This suggests that time-invariant unobserved differences between men are important in explaining self-employment exit.

Results from the pooled model indicate that self-employment exit is higher among younger workers than older workers – the coefficient on being aged below 30 years is positive and statistically significant relative to being aged 45 or older. This might

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[19] McManus (2000) suggests that the highly structured labour market and social protection of employees in Germany make self-employment less likely than in other nations.

reflect a lack of experience or general human capital required to successfully run a business or a lack of suitable networks and contacts (see also Bates 1990; Holtz-Eakin et al 1994b; Taylor 1999; Taylor 2004; Millán et al 2011). This relationship emerges clearly in Germany, Greece and Portugal, while in Britain men aged between 30 and 44 years of age have the highest probability of leaving self-employment.

Marriage generally reduces the chances of self-employment exit, which might reflect the social capital (or financial and/or emotional support) associated with having a partner or the impact of the additional responsibility on perseverance (Parker 2004). This negative coefficient appears in almost all country-specific models, but is statistically significant in those for France and Greece. The probability of self-employment exit is lower among the highly educated – the coefficient on the high education term is negative and statistically significant (see also Bates 1990; Lin et al 2000; Millán et al 2011). This would imply that human capital as measured by qualifications is important in self-employment survival. However this only emerges in the country-specific models for Greece.[20] Homeownership on average reduces self-employment exits, and this emerges in Britain, Italy and Portugal. This may be related to access to finance or assets, with those with greater access to credit or assets more able to survive in self-employment (see, for example, Holtz-Eakin et al 1994b). However it is also possible that this is endogenous, in that more successful entrepreneurs own their home rather than renting accommodation. The probability of exiting self-employment is higher for those with a limiting health condition (see also Taylor 2001), but this does not emerge in any country-specific specification.

The subsequent three variables relate to unemployment experiences, and capture whether or not the man had experienced unemployment in the preceding five years, the prevailing country, gender and age-specific unemployment rate and whether or not the man entered self-employment from unemployment. Research on unemployment scarring would suggest that men who have experienced unemployment in the past are more likely to enter unemployment in the future (Arulampalam et al 2000; Gregg 2001; Arulampalam and Stewart 2009; Böheim and Taylor 2002). Our results are consistent with this, men who have experienced recent unemployment are more likely

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[20] Carrasco (1999), Taylor (1999) and Lohman and Luber (2004) report little impact for education on the probability of leaving self-employment in Spain, Britain and Germany respectively.

to leave self-employment all else equal (see also Carrasco 1999; Taylor 1999; van Praag 2003; Barbieri and Bison 2004; Millán et al 2011). A statistically significant association between previous unemployment experiences and self-employment exit emerges in Greece, Ireland, Italy, Portugal and Spain, while in Britain and Greece having entered self-employment directly from unemployment increases the probability of exit. On average the probability of leaving self-employment falls with the unemployment rate – the coefficient is negative and statistically significant in the pooled specification and also that for Greece. However it has a positive impact in Britain (see also Taylor 1999; Taylor 2001) indicating that exits from self-employment are more likely when labour demand is low.[21]

The final three variables capture self-employment performance, in terms of the effort expended (hours worked per week), success (log income) and duration (months spent in current self-employment spell). The results indicate that those working more hours per week are less likely to leave self-employment, and this effect emerges in Greece, Italy, Portugal and Spain (and to a lesser extent in Britain and Germany). This may indicate that those more committed to their self-employment venture are more likely to remain self-employed.[22] Self-employment exit is also inversely related to income from self-employment (see also Taylor 2004; Millán et al 2011). While a negative relationship emerges in all countries, it is statistically significant in France, Greece, Italy and Portugal, and on the margins of statistical significance in Spain. Therefore those who receive larger incomes from self-employment are more likely to remain in self-employment, all else equal. Finally, there is evidence of negative duration dependence in self-employment, in that the probability of leaving falls with the elapsed duration in self-employment. This emerges in all countries except Germany and Portugal (where the estimated coefficients on elapsed self-employment duration are negative, but not statistically significant from zero). This is a common finding in the literature, as the exit rates from self-employment are highest in the years immediately following entry (Carrasco 1999; Bates 1990; Taylor 2001; Lohman and Luber 2004; Millán et al 2011).

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[21] Interactions between being in a high skilled occupation and the unemployment rate proved statistically insignificant in all countries.
[22] Alternatively, this could be endogenous, as more successful entrepreneurs work more hours per week, or those with weak attachments to self-employment who are more likely to seek work in paid employment spend less time working.

The estimates in the pooled specification indicate that the probability of self-employment exit is higher in Spain than in Britain, but lower in France, Ireland and Italy, holding other characteristics constant. Therefore an otherwise similar man would be most likely leave self-employment if living Spain, and least likely to leave if living in France, Ireland or Italy. Table 10 presents the year and country-specific predicted probabilities of entering self-employment, calculated from the country-specific models. This confirms that the highest probability of self-employment exit between two consecutive years is in Spain (where on average 16.1% of those self-employed at t are predicted to leave self-employment by $t+1$), followed by Britain (13.7%), Portugal (12.6%) and Germany (12.4%). It is lowest in France (4.3%) and Ireland (8.3%). These predicted probabilities of self-employment entry have a correlation with the EPL index of –0.08, indicating little correlation between self-employment exit and the strictness of EPL.[23]

In Table 11 we use the average characteristics of men in each country to estimate their predicted probability of entering self-employment using the estimated coefficients from each other country – analogous to that for self-employment entry shown in Table 8.[24] The columns refer to using the estimated coefficients from each country and therefore indicate the extent to which the returns to characteristics in each country make self-employment exit more or less likely. The rows refer to using the characteristics from each country and indicate the extent to which it is the characteristics of individuals within each country that make self-employment exit more or less likely. This suggests that on average the returns to characteristics make self-employment exit most likely in Greece and Spain – the estimated probabilities of leaving self-employment are consistently higher when using coefficients for these countries than for others. Therefore labour market settings, institutions and operation in those countries appear least suited to encouraging self-employment survival. In contrast, the returns to characteristics in France, Italy, Ireland and Germany make self-employment exit least likely – the estimated probabilities for leaving self-

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[23] Again, the probabilities in France are very low relative to those in other countries, and this could be biasing the correlation with EPL tightness. Removing the numbers for France leads to a correlation of 0.05 – suggesting a still weak correlation between strictness of EPL and self-employment exit.

[24] As for self-employment entry, we retain the unemployment rate in the host nation and therefore assume that individuals face the prevailing unemployment rate in each country (and that the unemployment rate is a country-specific variable rather than an individual-specific variable).

employment is consistently lower when using coefficients from these countries than from others. Thus the way the labour market operates in these countries is more conducive to self-employment survival.

In contrast, Table 11 suggests that men in Greece, France and Spain have (observed and unobserved) characteristics that make them least likely to exit self-employment. The predicted probabilities of leaving self-employment are consistently lower when using the characteristics of men from these countries. Men in Germany, Italy and Britain have characteristics that on average make them most likely to leave self-employment – self-employment exit rates are on average higher when using characteristics from these countries. This suggests that the high predicted probabilities of leaving self-employment in Spain are caused by the way the labour market in Spain operates rather than the characteristics of men who live in Spain. The labour markets in Greece and Portugal are also less conducive to self-employment survival, but the characteristics of men in these countries help mediate this.

Self-employment incidence and persistence

Having examined transitions into and out of self-employment, we now turn to identifying the causal relationship between self-employment in subsequent periods in a dynamic framework. In particular we estimate the probability of current self-employment (at t) as a function of self-employment in the previous year (at t–1) allowing for unobserved heterogeneity and initial conditions as in equation [12]. Again we estimate a specification pooling the data from all eight countries together with country-specific models.

Table 12 presents the estimates from two models in which the data have been pooled. Model [1] includes country identifiers, while model [2] includes interaction terms between the country identifiers and self-employment at t–1. The latter indicates the extent to which persistence in self-employment varies between countries. The χ^2 test clearly rejects the null hypothesis that these interaction terms are jointly zero and therefore we focus discussion on the estimates from model [2].[25] These indicate a

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[25] Also a χ^2 test rejects the null hypothesis that the estimated coefficients on the means of the time-varying covariates are jointly zero. This indicates the importance of allowing for correlation between the observables and unobservables.

strong causal relationship between self-employment in t–1 and self-employment at t (which may reflect state dependence or duration dependence) – the estimated coefficient on the lagged self-employment indicator is large, positive and highly statistically significant.[26] However, the coefficient on being self-employed in the initial period (when t=1) is even larger than that on being self-employed in the previous period. Therefore being self-employed when first observed in the data has a larger impact on the probability of current self-employment than being self-employed in the previous year. This suggests that as well as a high degree of persistence in self-employment, there is a core group of people who are 'serial' entrepreneurs (Henley 2004) and who will repeatedly become self-employed. There are a number of potential reasons for this. It may be caused by particular workers being more suited and productive in self-employment than paid employment, and therefore having a taste for it. Alternatively, it may be caused by workers being misfits in paid employment, and therefore repeatedly resorting to self-employment through a lack of suitable opportunities in paid employment.

The interactions highlight some cross-country differences in the persistence and incidence in self-employment. In particular, there is significantly less self-employment mobility in France than Britain – the coefficient on the France indicator is negative (indicating lower levels of self-employment entry in France than Britain) while that on the interaction is large and positive (indicating a stronger relationship between past and current self-employment in France than Britain). A similar, but less pronounced, pattern emerges for Germany where a highly structured labour market makes transitions into self-employment less likely (McManus 2000). We find that self-employment persistence is higher in France, Germany and Ireland than in Britain – the estimated coefficients on the interaction terms are positive and statistically significant. In contrast, there is less persistence in self-employment in Spain than in Britain holding the characteristics of the workforce constant.

Consistent with our previous models, the estimates indicate that the probability of being self-employed is higher for those between 30 and 44 years of age relative to those aged 45 and above, for the married rather than single, and for the more highly

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[26] Henley (2004) reports a similar finding for Britain, as do Caliendo and Uhlendorff (2008) for Germany.

educated relative to the less educated (see also Caliendo and Uhlendorff 2008; Hamilton 2000; Henley 2004; Taylor 1996). Men who have recently experienced unemployment are more likely to be in self-employment, all else equal. Again, this is consistent with the unemployment push hypothesis found in previous studies. However, the probability of self-employment falls with the country, age and gender-specific unemployment rate – the coefficient is negative and statistically significant. Therefore individual unemployment experiences increase the probability of being self-employed while higher levels of unemployment in the economy reduce it (see also Blanchflower 2000; Blanchflower and Oswald 1998; Taylor 1996).

The country-specific estimates are presented in Table 13 and are also consistent with our previous models. We therefore focus discussion on the key variable of interest, the lagged dependent variable. Consistent with Table 12, these reveal that the most persistence in self-employment is found in France and Germany, while there is least persistence in Spain. In all countries, however, there is evidence of strong persistence in self-employment. In Britain, France and Germany, the size of these persistence effects exceed those of being self-employed in the initial period (when $t=1$), and these differences are statistically significant. In these countries being self-employed one year previously is a more important predictor of current self-employment than being self-employed when first observed in the data. However in the Southern European countries and Ireland, being self-employed in the initial period has a larger impact on the probability of current self-employment than being self-employed in the previous period (and these differences are statistically significant in Italy, Portugal and Spain). Therefore in these countries there is greater evidence that men become locked into self-employment either because they are more suited and productive in self-employment than paid employment, or because they are misfits in paid employment and therefore repeatedly resort to self-employment.

To illustrate the sizes of these country-specific causal effects, Table 14 presents the mean predicted probability of self-employment if not self-employed at $t–1$, if self-employed at $t–1$, and the difference between these (which we call the marginal effect). The mean predicted probability of self-employment at t conditional on not being self-employed at $t–1$ is lowest in France, Germany, Britain and Ireland. In these countries the predicted probability of entering self-employment between $t–1$ and t is 7% or less.

It exceeds 10% in Spain, Portugal, Italy and Greece (where it is 17%). The mean predicted probability of self-employment at t conditional on self-employment at $t-1$ is lowest (below 40%) in Portugal and Spain. In these countries persistence in self-employment is relatively low. In contrast it is relatively high (approaching 50%) in Britain, Germany and Greece, and 90% in France – therefore in these countries men in self-employment one year ago have a high probability of current self-employment. The marginal effects of self-employment at $t-1$ vary considerably across countries. Self-employment in the previous year has the smallest impact on the probability of current self-employment (the marginal effect is smallest) in Spain (0.200) and Portugal (0.293). It has the largest effect in France (0.893), Germany (0.461) and Britain (0.415). Self-employment status one year ago has the largest impact on the probability of current self-employment in these countries.

As a further step, we have estimated country-specific models including interactions between the lagged dependent variable and year dummies to examine how changes in self-employment persistence vary with the strictness of EPL. The year and country-specific predicted probabilities and marginal effects are presented in Table 15. Rather than discuss these results in detail, we instead summarise how they correlate with strictness of EPL, again measured with the OECD indicator summarised in Table 2. The predicted probabilities of self-employment at t conditional on not being self-employed at $t-1$ have a correlation with EPL strictness of 0.28. Therefore again we find evidence for a positive correlation between self-employment entry rates and EPL, which increases to 0.48 if France is excluded. However, there is a weaker correlation between the probability of self-employment at t conditional on self-employment in $t-1$ and EPL of 0.17 (which falls to 0.05 if France is excluded). Finally, the estimated marginal effects have a correlation with EPL of 0.09 (which changes to –0.12 if France is excluded). Therefore the strongest correlation is between self-employment entry and EPL, which is positive and therefore indicates that the conditional probability of self-employment increases in countries/years where EPL is stricter. As EPL acts as a tax that reduces job creation (as employers are more reluctant to open a vacancy when EPL is high), then our results suggest that workers react to this by becoming more likely to start their own business. A general conclusion in the literature is that labour market flows decline with EPL (see Boeri and van Ours 2008 for a summary), with less job creation and job destruction, and fewer unemployment

inflows and unemployment outflows. However our results suggest that flows into self-employment are positively associated with EPL.

Our final analysis investigates the extent to which persistence in self-employment varies with other observable characteristics of the worker and the labour market in which he is situated. Table 16 presents the coefficients on interactions with the lagged dependent variable with age, education, home ownership, health, recent unemployment experiences and the country, age and gender-specific unemployment rate. The results indicate that younger workers generally exhibit less persistence in self-employment – the estimated coefficients on the self-employed at t–1 and aged under 45 interaction terms are generally negative (for all countries but Ireland) and are statistically significant in the majority of cases. Therefore men aged less than 45 are more likely than those aged 45 or older to leave self-employment, maybe reflecting greater opportunities in paid employment or the lack of capital (human, financial or social) necessary to operate a lasting business enterprise. This is particularly apparent among Southern European countries. The causal relationship between self-employment at t–1 and self-employment at t does not vary systematically with education across countries. It is stronger among the more highly educated in Greece, but is weaker among the more highly educated in Italy and Spain. This perhaps indicates either that men in Greece learn the skills necessary to successfully operate a business within the formal education system or that there are fewer suitable options in the paid labour market for more highly educated men in Greece. The opposite applies in Italy and Spain. Home ownership generally strengthens the causal relationship – the estimated coefficient on the interaction term is positive in all countries except Ireland although it is statistically significant for Britain and Spain. This could reflect the access to financial markets and capital that home ownership allows.[27] Previous recent personal unemployment experiences have a consistently negative impact on self-employment persistence (and the impact is statistically significant in all countries other than France and Germany). This indicates that those with an unstable recent employment history are more likely to leave self-employment, all else equal, which is consistent with the scarring effects of unemployment found in previous research. However persistence in self-employment appears to be orthogonal to labour demand

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[27] Home ownership is also potentially endogenous if more successful business owners become home owners because of their longevity in self-employment

in the local economy – the interaction between being self-employed at $t–1$ and the unemployment rate is not significant. The exception is in Portugal where it reduces persistence in self-employment, and therefore in Portugal the causal relationship between self-employment at $t–1$ and self-employment at t is weaker when labour demand is low.

6. Conclusions

Our focus in this paper has been to investigate differences and similarities between European countries in the dynamics and persistence of self-employment using comparable micro-data. Many European countries have introduced policies promoting self-employment and aiding small business start-up, which may not only be a source of labour market flexibility but is also seen as an important route out of unemployment and into work, and of job creation, innovation, invention and competition. To what extent can differences in self-employment experiences between countries be explained by differences in characteristics, and to what extent can they be explained by labour market settings and institutions? We examine these issues using data for Britain, France, Germany, Greece, Ireland, Italy, Portugal and Spain.

Our analysis has identified both commonalities as well as significant cross-national variation in the factors associated with self-employment flows and persistence. We have consistent effects across countries of age, marital status and dependent children, health, previous unemployment and employment experiences and labour demand on self-employment entry. Similarly, income from self-employment, elapsed duration in self-employment, hours worked, previous unemployment experiences, home ownership and age have consistent impacts across countries on self-employment exit. A cross-country comparison indicates that labour markets in Greece, Italy and Portugal are most conducive to self-employment entry, while those in France and Germany are least conducive. Men in Germany have characteristics associated with a higher propensity to enter self-employment and those in Portugal have characteristics associated with a lower propensity to enter self-employment. In general, both the returns to characteristics and the characteristics themselves of men in France act to reduce self-employment flows, while in Germany we find that the labour market acts to reduce self-employment flows, while the characteristics of men are associated with

higher flows into and out of self-employment. In contrast, the labour markets in Greece and Portugal are more conducive to self-employment entry and less conducive to self-employment survival, but the characteristics of men in these countries mediate these effects. We also find that the relatively high predicted probabilities of leaving self-employment in Spain can be explained by the way labour market operates rather than the characteristics of men in Spain.

We find a high degree of (causal) persistence in self-employment across countries, which is most pronounced in France and Germany and least pronounced in Spain. This persistence varies consistently across countries with age, home ownership and recent unemployment experiences. Examining our findings in relation to levels of employment protection legislation (EPL) in the countries studied reveals a positive relationship between EPL and self-employment entry. As EPL acts as a tax that reduces job creation (as employers are more reluctant to open vacancy when EPL is high), then our results suggest that workers react to this by becoming more likely to start their own business. A general conclusion in the literature is that labour market flows decline with EPL with less job creation, job destruction, and reduced unemployment inflows and unemployment outflows. We find that people respond to a less dynamic labour market by becoming self-employed. No relationship emerges between EPL and self-employment survival or persistence.

Our results suggest that policies aimed at moving individuals into self-employment can only be temporary solutions – and further support is required once self-employed to prevent exits. The apparent scarring impacts of unemployment on self-employment indicate that policies targeted at reducing the incidence of unemployment in the short-run have beneficial longer run effects on self-employment persistence and survival, but also reduce entry rates into self-employment. Employment instability and turnover, and the higher associated risks of unemployment, increase the likelihood of self-employment entry, but also self-employment exits. The fact that formal qualifications has little impact on self-employment flows, while age has a consistent impact, suggests that education and training schemes should be focused more on skills typically acquired with experience and improving worker's social capital rather than qualification accumulation.

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Table 1: Self-employment as a percentage of total employment: Selected EU countries 1993–2007

	1993	1995	1997	1999	2001	2003	2005	2007
EU15	16.2	16.1	15.3	14.7	14.4	14.5	14.4	14.3
France	11.6	10.7	10.1	9.5	8.9	8.8	8.9	8.9
Germany	9.7	10.0	10.2	10.0	10.1	10.5	11.2	11.2
Greece		44.5	44.2	42.5	38.0	37.3	35.1	34.8
Ireland		20.5	19.4	19.2	18.1	17.7	16.9	17.3
Italy	26.7	26.9	26.8	26.4	26.0	25.6	24.7	24.1
Portugal			21.2	20.4	20.7	20.2	19.1	18.2
Spain	19.2	18.7	17.3	16.9	15.6	15.0	14.6	13.8
UK	13.5	13.8	13.4	12.5	12.1	12.9	12.8	13.4

Source: Figures from EC (2005; 2008).

Table 2: Overall strictness of employment protection: OECD version 1

	1993	1995	1997	1999	2001	2003	2005	2007
France	2.98	2.98	2.98	2.98	3.05	3.05	3.05	3.05
Germany	3.21	3.09	2.34	2.34	2.34	2.09	2.12	2.12
Greece	3.50	3.50	3.50	3.50	3.50	2.73	2.73	2.73
Ireland	0.93	0.93	0.93	0.93	0.93	1.11	1.11	1.11
Italy	3.57	3.57	3.26	2.70	2.01	1.82	1.82	1.82
Portugal	3.85	3.85	3.67	3.67	3.67	3.67	3.46	3.46
Spain	3.82	3.01	2.93	2.93	3.05	2.98	2.98	2.98
UK	0.60	0.60	0.60	0.60	0.68	0.75	0.75	0.75

Source: Figures from OECD statistical data, available online at
http://stats.oecd.org/Index.aspx?QueryName=252&QueryType=View#

Table 3: Non-agricultural male self-employment rates in selected EU countries, ECHP 1994-2001

	1994	1995	1996	1997	1998	1999	2000	2001	Total	Ever self-employed
Total	15.7	15.8	15.7	15.6	15.7	15.4	15.5	15.2	15.6	19.5
Britain	14.9	15.2	15.0	13.8	13.2	12.9	12.5	12.6	13.8	18.7
France	6.7	7.1	7.6	7.9	7.9	6.6	7.3	6.5	7.2	8.0
Germany	6.4	6.9	6.6	7.3	6.0	6.8	7.5	7.7	6.9	10.3
Greece	30.2	29.7	29.0	28.9	30.0	28.8	29.3	27.9	29.3	33.9
Ireland	14.2	13.9	14.0	13.9	14.1	13.4	13.1	13.4	13.8	16.4
Italy	20.3	21.0	20.9	21.1	20.9	20.7	20.7	21.3	20.9	26.0
Portugal	17.1	17.4	16.7	16.3	16.4	16.3	16.6	16.3	16.6	21.3
Spain	15.9	15.2	15.7	15.5	16.0	15.9	15.9	14.6	15.6	20.1

Source: Author's calculations based on ECHP 1994–2001. Figures relate to proportion of men aged 22–59 in self-employment.

Table 4: Labour market status at *t*+1 of men in self-employment at *t*, ECHP 1994–2001 (row percentages)

	Self-employed	Employee		Out of work		N	Persistence in employment
			Status at *t*+1				
Total	90.7	6.8	(73.9)	2.4	(26.1)	23133	93.9
Britain	88.1	9.1	(76.5)	2.8	(23.5)	2140	95.1
France	96.0	2.1	(52.5)	1.9	(47.5)	1264	95.4
Germany	90.4	7.4	(77.1)	2.2	(22.9)	1278	94.1
Greece	92.2	5.3	(67.9)	2.5	(32.1)	4645	91.8
Ireland	92.3	5.3	(68.8)	2.4	(31.2)	1373	94.1
Italy	91.8	5.6	(68.3)	2.6	(31.7)	5928	92.8
Portugal	90.4	8.1	(84.4)	1.5	(15.6)	2827	94.3
Spain	86.7	10.4	(78.2)	2.9	(21.8)	3678	90.8

Notes: Status measured at each date of interview. Self-employment and employee status are defined by the respondent. Figures in brackets are the proportion of self-employment exits to each labour market state.

Table 5: Inflow rates from paid employment and non-work into self-employment between *t* and *t*+1, ECHP 1994–2001

	Employee		Out of work	
		Status at *t*		
Total	1.9	(7.8)	2.8	(2.9)
Britain	1.7	(9.0)	3.4	(3.3)
France	0.3	(3.2)	1.3	(2.8)
Germany	0.9	(10.7)	1.8	(3.6)
Greece	3.2	(5.9)	4.1	(1.9)
Ireland	1.8	(8.3)	2.2	(2.9)
Italy	2.6	(7.0)	2.8	(2.9)
Portugal	2.4	(9.9)	2.4	(2.0)
Spain	2.4	(9.5)	3.5	(4.7)

Notes: Status measured at each date of interview. Self-employment and employee status are defined by the respondent. Figures in brackets are the proportion of the self-employed at *t*+1 who entered from each state.

Table 6: Entry into self-employment between *t* and *t*+1: ECHP 1994–2001

Characteristics at *t*	All	Britain	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Aged under 30	0.234	0.020	0.162	0.355	0.171	0.195	0.581	0.101	0.262
	[4.96]	[0.15]	[0.72]	[1.99]	[1.25]	[1.11]	[5.43]	[0.82]	[2.30]
Aged 30-44	0.227	–0.120	0.258	0.460	0.191	–0.011	0.446	0.164	0.303
	[6.24]	[1.18]	[1.55]	[3.34]	[1.89]	[0.09]	[5.34]	[1.70]	[3.43]
Married	0.086	0.104	0.200	–0.169	0.051	0.298	–0.038	0.289	0.131
	[2.29]	[0.97]	[1.07]	[1.23]	[0.46]	[2.00]	[0.44]	[2.79]	[1.48]
Has child aged < 12	0.137	0.048	0.430	0.278	0.134	–0.048	0.199	0.136	0.064
	[4.11]	[0.49]	[2.38]	[2.15]	[1.40]	[0.40]	[2.58]	[1.62]	[0.85]
High education	0.072	0.060	0.167	0.343	–0.088	0.218	0.219	–0.056	–0.026
	[1.64]	[0.61]	[0.87]	[1.77]	[0.73]	[1.25]	[1.96]	[0.32]	[0.27]
Medium education	0.012	0.090	0.132	–0.092	–0.204	0.235	–0.039	–0.028	0.211
	[0.33]	[0.70]	[0.86]	[0.57]	[2.19]	[1.86]	[0.55]	[0.25]	[2.52]
Home owner	0.035	0.094	–0.087	0.053	0.007	0.156	0.064	0.067	–0.024
	[1.07]	[0.89]	[0.61]	[0.48]	[0.08]	[0.98]	[0.91]	[0.84]	[0.29]
Limiting health	–0.223	–0.317	–0.513	–0.041	–0.478	–0.164	–0.394	0.003	–0.291
	[4.50]	[1.99]	[2.32]	[0.33]	[2.93]	[0.90]	[2.87]	[0.03]	[2.07]
Permanent job	–0.290	–0.246	–0.534	–0.132	–0.677	–0.261	–0.173	–0.335	–0.185
	[9.31]	[2.20]	[2.94]	[1.09]	[8.14]	[2.09]	[2.48]	[4.37]	[2.44]
Professional	0.091	0.581	0.790	0.759	–0.562	0.024	–0.012	0.258	0.254
	[1.25]	[1.88]	[0.69]	[1.17]	[2.60]	[0.08]	[0.07]	[1.02]	[1.19]
Unemployed	0.356	0.483	0.636	0.990	0.060	0.252	0.271	0.252	0.411
	[8.15]	[3.12]	[2.58]	[4.42]	[0.50]	[1.51]	[2.93]	[1.69]	[4.85]
Inactive	–0.127	0.129	0.743	0.324	–0.301	–0.182	–0.382	–0.248	–0.073
	[2.51]	[0.76]	[3.05]	[1.51]	[2.23]	[0.90]	[3.45]	[1.85]	[0.61]
Unemployed 5 yrs	0.211	0.179	–0.010	0.203	0.093	0.282	0.277	0.344	0.146
	[5.88]	[1.74]	[0.06]	[1.48]	[0.99]	[2.07]	[3.52]	[3.29]	[1.81]
Unemployment rate	–0.018	–0.015	–0.047	–0.027	–0.022	–0.036	–0.027	–0.006	–0.010
	[6.43]	[0.73]	[1.73]	[0.49]	[2.89]	[2.12]	[4.92]	[0.43]	[2.11]
Unemployment rate* professional	0.007	–0.068	–0.078	–0.025	0.047	0.005	0.024	0.013	0.001
	[1.16]	[1.98]	[0.67]	[0.31]	[2.12]	[0.17]	[1.60]	[0.34]	[0.07]
France	–0.838								
	[9.89]								
Germany	–0.443								
	[6.31]								
Greece	0.370								
	[5.72]								
Ireland	–0.053								
	[0.72]								
Italy	0.265								
	[4.51]								
Portugal	0.175								
	[2.67]								
Spain	0.231								
	[3.70]								
Rho	0.568	0.544	0.555	0.649	0.536	0.526	0.558	0.534	0.597
Log-likelihood	–11402	–1239	–444	–989	–1476	–762	–2539	–1529	–2275
N observations	123939	13324	16051	19522	10838	8536	22029	14088	19551
N individuals	30240	2988	3991	4505	2776	2258	5410	3301	5011

Notes: Random effects probit estimates where dependent variable takes value 1 if man who is not self-employed at *t* is self-employed at *t*+1, and zero if not self-employed at *t*+1. Absolute value of coefficient divided by standard error in brackets. All models also include time dummies.

Table 7: Predicted probability of entering self-employment between *t* and *t*+1:
ECHP 1994–2001

				Year				
	1995	1996	1997	1998	1999	2000	2001	Average
Britain	0.028	0.023	0.024	0.025	0.027	0.027	0.028	0.026
France	0.006	0.005	0.005	0.005	0.006	0.006	0.007	0.006
Germany	0.014	0.013	0.013	0.013	0.013	0.013	0.015	0.013
Greece	0.064	0.039	0.041	0.042	0.040	0.039	0.039	0.044
Ireland	0.025	0.020	0.021	0.022	0.025	0.028	0.029	0.024
Italy	0.036	0.034	0.035	0.036	0.036	0.037	0.039	0.036
Portugal	0.040	0.030	0.030	0.030	0.030	0.030	0.033	0.032
Spain	0.037	0.034	0.035	0.036	0.036	0.036	0.037	0.036

Notes: Predicted probabilities based on the estimates in Table 6.

Table 8: Predicted probabilities of entering self-employment using coefficients
from one country and sample characteristics from another

	Using estimated coefficients from:							
Using characteristics of:	Britain	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Britain	0.026	0.005	0.010	0.038	0.026	0.042	0.039	0.025
France	0.026	0.006	0.008	0.040	0.024	0.036	0.037	0.027
Germany	0.041	0.011	0.013	0.054	0.041	0.052	0.056	0.045
Greece	0.028	0.005	0.007	0.044	0.025	0.038	0.036	0.026
Ireland	0.026	0.005	0.008	0.042	0.024	0.037	0.038	0.026
Italy	0.031	0.006	0.007	0.046	0.026	0.036	0.036	0.028
Portugal	0.023	0.004	0.005	0.042	0.020	0.031	0.032	0.021
Spain	0.040	0.009	0.013	0.064	0.036	0.054	0.053	0.036

Notes: Predicted probabilities based on the estimates in Table 6, with the columns showing the results from using the estimated coefficients from the country specific models, and the rows the results from using the sample characteristics from each country. See text for details.

Table 9: Exit from self-employment between *t* and *t*+1: ECHP 1994–2001

Characteristics at *t*	All	Britain	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Aged under 30	0.200	0.232	–0.266	0.815	0.278	–0.176	0.140	0.428	0.003
	[3.08]	[1.33]	[0.47]	[2.68]	[1.89]	[0.70]	[0.93]	[2.05]	[0.02]
Aged 30-44	0.018	0.240	–0.006	0.273	0.029	–0.269	–0.045	0.144	–0.061
	[0.44]	[2.16]	[0.03]	[1.48]	[0.31]	[1.73]	[0.48]	[1.07]	[0.63]
Married	–0.127	–0.011	–0.609	0.111	–0.233	0.176	–0.007	–0.268	–0.127
	[2.56]	[0.09]	[2.00]	[0.56]	[2.09]	[0.84]	[0.07]	[1.54]	[1.15]
Has child aged < 12	0.056	–0.055	–0.234	–0.293	0.096	–0.079	0.136	0.197	0.101
	[1.35]	[0.48]	[0.94]	[1.49]	[0.99]	[0.52]	[1.51]	[1.53]	[1.11]
High education	–0.118	–0.034	–0.445	–0.368	–0.298	0.006	0.236	0.249	–0.061
	[2.22]	[0.31]	[1.41]	[1.23]	[2.56]	[0.03]	[1.67]	[0.96]	[0.55]
Medium education	–0.043	–0.066	–0.250	0.108	–0.135	0.053	–0.144	0.319	0.074
	[0.98]	[0.46]	[1.07]	[0.38]	[1.54]	[0.37]	[1.57]	[1.72]	[0.75]
Home owner	–0.154	–0.248	–0.101	–0.137	–0.093	0.230	–0.219	–0.279	–0.027
	[3.77]	[2.13]	[0.46]	[0.84]	[1.07]	[0.93]	[2.48]	[2.19]	[0.27]
Limiting health	0.128	–0.152	0.527	0.020	0.127	–0.194	0.030	0.147	0.097
	[2.10]	[0.67]	[1.85]	[0.11]	[0.86]	[0.78]	[0.20]	[1.56]	[0.67]
Unemployed 5 yrs	0.348	0.133	–0.054	0.172	0.215	0.343	0.340	0.538	0.326
	[6.87]	[1.07]	[0.18]	[0.77]	[1.96]	[1.82]	[2.93]	[2.82]	[2.94]
Unemployment rate	–0.010	0.098	0.083	–0.893	–0.026	0.011	–0.003	–0.010	0.006
	[2.14]	[2.25]	[1.55]	[1.37]	[2.29]	[0.14]	[0.33]	[0.29]	[0.72]
Entered from unemp	0.045	0.328	–0.316	–0.250	0.350	–0.118	0.154	–0.104	–0.010
	[0.90]	[1.98]	[1.14]	[0.91]	[2.85]	[0.67]	[1.53]	[0.51]	[0.11]
Professional	–0.039	0.118	0.174	0.193	–0.146	–0.169	–0.038	–0.151	–0.010
	[0.98]	[1.19]	[0.75]	[1.13]	[1.81]	[1.13]	[0.40]	[1.21]	[0.13]
Weekly hours	–0.011	–0.005	0.001	–0.008	–0.013	–0.003	–0.014	–0.017	–0.009
	[9.12]	[1.79]	[0.15]	[1.66]	[5.22]	[0.81]	[4.45]	[3.82]	[3.32]
Income (log)	–0.049	–0.047	–0.242	–0.054	–0.146	–0.083	–0.100	–0.119	–0.058
	[4.21]	[1.16]	[2.08]	[0.72]	[3.31]	[1.22]	[3.66]	[2.90]	[1.72]
Duration in SE	–0.029	–0.081	–0.036	0.002	–0.018	–0.039	–0.027	–0.009	–0.037
	[8.50]	[5.52]	[1.96]	[0.04]	[2.53]	[2.90]	[3.62]	[0.91]	[4.43]
France	–0.510								
	[4.34]								
Germany	–0.179								
	[1.85]								
Greece	0.092								
	[0.99]								
Ireland	–0.262								
	[2.64]								
Italy	–0.161								
	[2.20]								
Portugal	0.057								
	[0.62]								
Spain	0.396								
	[4.22]								
Rho	0.409	0.237	0.354	0.460	0.304	0.196	0.466	0.509	0.383
Log-likelihood	–6513	–702	–188	–379	–1136	–331	–1533	–789	–1292
N observations	23133	2140	1264	1278	4645	1373	5928	2827	3678
N individuals	6576	609	339	428	1252	427	1596	788	1137

Notes: Random effects probit estimates where dependent variable takes value 1 if man who is self-employed at *t* is not self-employed at *t*+1, and zero if remains self-employed at *t*+1. Absolute value of coefficient divided by standard error in brackets. All models also include time dummies.

Table 10: Predicted probability of leaving self-employment between *t* and *t*+1: ECHP 1994–2001

	Year							
	1995	1996	1997	1998	1999	2000	2001	Average
Britain	0.109	0.095	0.160	0.136	0.132	0.169	0.169	0.137
France	0.024	0.042	0.027	0.067	0.048	0.068	0.075	0.048
Germany	0.118	0.101	0.152	0.137	0.122	0.123	0.120	0.124
Greece	0.143	0.073	0.092	0.068	0.085	0.079	0.078	0.090
Ireland	0.069	0.094	0.072	0.039	0.081	0.162	0.096	0.083
Italy	0.095	0.099	0.108	0.132	0.115	0.103	0.105	0.108
Portugal	0.122	0.120	0.150	0.151	0.119	0.104	0.117	0.126
Spain	0.169	0.138	0.147	0.139	0.183	0.176	0.185	0.161

Notes: Predicted probabilities based on the estimates in Table 9.

Table 11: Predicted probabilities of entering self-employment using coefficients from one country and sample characteristics from another

	Using estimated coefficients from:							
Using Characteristics of:	Britain	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Britain	0.137	0.115	0.081	0.250	0.130	0.111	0.199	0.250
France	0.102	0.048	0.081	0.160	0.070	0.068	0.135	0.162
Germany	0.199	0.133	0.124	0.230	0.117	0.125	0.226	0.254
Greece	0.069	0.019	0.068	0.090	0.043	0.037	0.080	0.117
Ireland	0.105	0.079	0.083	0.230	0.083	0.078	0.166	0.181
Italy	0.124	0.118	0.129	0.271	0.107	0.108	0.209	0.209
Portugal	0.118	0.063	0.115	0.168	0.092	0.084	0.126	0.177
Spain	0.121	0.039	0.086	0.146	0.077	0.076	0.118	0.161

Notes: Predicted probabilities based on the estimates in Table 9, with the columns showing the results from using the estimated coefficients from the country specific models, and the rows the results from using the sample characteristics from each country. See text for details.

Table 12: Probability of self-employment at *t*: ECHP 1994–2001

	[1]	[2]		[1]	[2]
Self-employed *t*–1	2.143	2.108	France	–0.201	–0.599
	[62.24]	[31.88]		[3.51]	[8.20]
Self-employed *t*=1	2.369	2.352	Germany	–0.108	–0.225
	[27.93]	[28.70]		[1.99]	[3.69]
Aged under 30	0.027	0.038	Greece	0.341	0.358
	[0.69]	[0.94]		[6.94]	[6.37]
Aged 30-44	0.089	0.092	Ireland	0.136	0.068
	[3.14]	[3.23]		[2.34]	[1.03]
Married	0.115	0.115	Italy	0.310	0.306
	[2.05]	[2.03]		[6.73]	[5.90]
Has child aged < 12	0.076	0.082	Portugal	0.258	0.250
	[1.92]	[2.06]		[4.85]	[4.25]
High education	0.102	0.084	Spain	0.151	0.269
	[3.37]	[2.75]		[2.52]	[4.20]
Medium education	0.033	0.022	Self-employed at *t*–1 and:		
	[1.24]	[0.84]	France		1.628
Home owner	–0.069	–0.070			[12.34]
	[1.58]	[1.59]	Germany		0.510
Limiting health	–0.081	–0.097			[5.11]
	[1.75]	[2.05]	Greece		–0.033
Unemployed 5 yrs	0.150	0.135			[0.41]
	[5.37]	[4.82]	Ireland		0.251
Unemployment rate	–0.008	–0.009			[2.42]
	[2.53]	[2.75]	Italy		0.006
Rho	0.479	0.482			[0.09]
			Portugal		–0.019
					[0.22]
			Spain		–0.367
					[4.76]
Chi² (Means=0)				49.60	45.79
P-value				0.0000	0.0000
Chi² (interactions=0)					298.56
P-value					0.0000
Log-likelihood				–18204	–18022
N observations			147072		
N individuals			34123		

Notes: Dynamic random effects probit estimates where dependent variable takes value 1 if a man is self-employed at *t*, and zero otherwise. Absolute value of coefficient divided by standard error in brackets. All models also include time dummies and means of time-varying covariates over time to allow for correlation between observables and unobservables – see text for details.

Table 13: Probability of self-employment at *t*: ECHP 1994–2001

	Britain	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Self-employed *t*–1	2.327	4.125	2.772	2.051	2.237	2.019	2.010	1.565
	[25.13]	[29.96]	[24.26]	[24.32]	[14.55]	[27.35]	[21.30]	[21.04]
Self-employed *t*=1	1.725	0.501	1.732	2.564	2.626	2.645	2.568	2.832
	[8.87]	[2.15]	[6.80]	[11.43]	[6.37]	[14.12]	[10.54]	[15.49]
Aged under 30	–0.205	–0.065	0.103	–0.035	0.224	0.325	–0.008	0.054
	[2.01]	[0.42]	[0.84]	[0.26]	[1.44]	[3.39]	[0.07]	[0.57]
Aged 30-44	–0.193	–0.007	0.234	–0.003	0.039	0.254	0.102	0.156
	[2.54]	[0.08]	[2.78]	[0.04]	[0.36]	[3.92]	[1.21]	[2.20]
Married	0.057	–0.057	–0.186	0.449	0.222	0.313	–0.126	0.019
	[0.39]	[0.25]	[1.13]	[2.52]	[0.74]	[2.66]	[0.76]	[0.14]
Has child aged < 12	0.196	–0.150	0.062	–0.067	–0.029	0.113	0.310	0.033
	[1.78]	[0.86]	[0.49]	[0.59]	[0.18]	[1.22]	[2.93]	[0.38]
High education	0.010	0.123	0.333	–0.040	0.268	0.167	–0.066	0.018
	[0.14]	[1.32]	[3.01]	[0.46]	[2.13]	[2.07]	[0.50]	[0.25]
Medium education	0.085	0.086	–0.063	–0.069	0.159	0.065	–0.033	0.075
	[0.94]	[0.93]	[0.62]	[0.96]	[1.62]	[1.21]	[0.34]	[1.16]
Home owner	0.070	–0.057	–0.212	–0.075	0.057	–0.043	0.008	–0.156
	[0.50]	[0.31]	[1.47]	[0.63]	[0.23]	[0.47]	[0.06]	[1.70]
Limiting health	–0.394	–0.309	0.060	–0.105	–0.089	–0.178	0.016	–0.085
	[2.46]	[1.77]	[0.59]	[0.76]	[0.46]	[1.41]	[0.13]	[0.73]
Unemployed 5 yrs	0.067	0.127	0.250	0.151	0.203	0.064	0.186	0.101
	[0.89]	[1.28]	[3.10]	[1.76]	[1.91]	[0.98]	[1.96]	[1.62]
Unemployment rate	–0.048	–0.124	–0.173	0.007	0.020	–0.019	–0.025	–0.009
	[1.58]	[3.36]	[0.93]	[0.73]	[0.45]	[2.84]	[1.17]	[1.41]
Rho	0.394	0.052	0.326	0.576	0.477	0.506	0.539	0.536
Chi^2 (Means=0)	8.32	7.51	10.61	22.49	0.73	18.65	11.18	11.88
P-value	0.1395	0.1854	0.0597	0.0004	0.9813	0.0022	0.0478	0.0365
Log-likelihood	–1973	–670	–1399	–2691	–1098	–4117	–2360	–3548
N observations	15464	17315	20800	15483	9909	27957	16915	23229
N individuals	3287	4233	4732	3584	2521	6399	3736	5631

Notes: Dynamic random effects probit estimates where dependent variable takes value 1 if a man is self-employed at *t*, and zero otherwise. Absolute value of coefficient divided by standard error in brackets. All models also include time dummies and means of time-varying covariates over time to allow for correlation between observables and unobservables – see text for details.

Table 14: Predicted probabilities of self-employment at *t* and marginal effects

	Mean predicted probability if not self-employed at *t*–1 [1]	Mean predicted probability if self-employed at *t*–1 [2]	Marginal effect [2]–[1]
Britain	0.052	0.467	0.415
France	0.006	0.899	0.893
Germany	0.020	0.482	0.461
Greece	0.171	0.506	0.334
Ireland	0.073	0.405	0.331
Italy	0.120	0.438	0.318
Portugal	0.097	0.390	0.293
Spain	0.102	0.302	0.200

Notes: Predicted probabilities based on results shown in Table 13.

Table 15: Predicted probabilities of self-employment at *t* and marginal effects: ECHP 1994–2001

	1995	1996	1997	1998	1999	2000	2001
Britain							
SE at *t*–1	0.518	0.546	0.415	0.437	0.449	0.385	0.386
Not SE *t*–1	0.067	0.057	0.058	0.049	0.052	0.050	0.050
Marginal effect	0.451	0.489	0.357	0.388	0.397	0.335	0.336
France							
SE at *t*–1	0.938	0.923	0.943	0.886	0.909	0.829	0.815
Not SE *t*–1	0.007	0.010	0.004	0.010	0.006	0.006	0.001
Marginal effect	0.932	0.913	0.939	0.875	0.903	0.824	0.814
Germany							
SE at *t*–1	0.384	0.515	0.506	0.553	0.575	0.485	0.504
Not SE *t*–1	0.018	0.023	0.032	0.025	0.028	0.011	0.014
Marginal effect	0.366	0.492	0.473	0.528	0.547	0.474	0.489
Greece							
SE at *t*–1	0.489	0.463	0.574	0.640	0.595	0.610	0.625
Not SE *t*–1	0.185	0.098	0.149	0.143	0.121	0.145	0.112
Marginal effect	0.304	0.525	0.424	0.498	0.434	0.465	0.513
Ireland							
SE at *t*–1	0.371	0.353	0.411	0.532	0.440	0.312	0.456
Not SE *t*–1	0.067	0.071	0.067	0.073	0.079	0.096	0.086
Marginal effect	0.303	0.283	0.344	0.458	0.362	0.217	0.370
Italy							
SE at *t*–1	0.425	0.427	0.423	0.408	0.429	0.463	0.464
Not SE *t*–1	0.110	0.119	0.126	0.132	0.118	0.120	0.132
Marginal effect	0.315	0.308	0.297	0.276	0.311	0.343	0.332
Portugal							
SE at *t*–1	0.374	0.388	0.358	0.357	0.430	0.463	0.454
Not SE *t*–1	0.090	0.101	0.099	0.111	0.087	0.094	0.081
Marginal effect	0.284	0.287	0.259	0.246	0.343	0.369	0.373
Spain							
SE at *t*–1	0.280	0.325	0.315	0.338	0.290	0.312	0.306
Not SE *t*–1	0.102	0.101	0.101	0.101	0.105	0.103	0.093
Marginal effect	0.178	0.224	0.214	0.237	0.185	0.208	0.213

Notes: Based on authors calculations from dynamic random effects probit allowing for initial conditions and including interactions between self-employment status at *t*–1 and year dummies.

Table 16: Probability of self-employment at *t*: ECHP 1994–2001

	Britain	France	Germany	Greece	Ireland	Italy	Portugal	Spain
Self-employed $t-1$	2.184	3.458	3.906	2.091	2.729	2.512	2.810	2.152
	[6.80]	[5.46]	[7.34]	[10.06]	[6.04]	[13.76]	[12.66]	[10.55]
Self-employed $t=1$	1.590	0.488	1.622	2.050	2.587	2.146	2.192	2.409
	[7.91]	[2.01]	[6.55]	[9.38]	[5.79]	[12.21]	[9.47]	[13.69]
Self-employed t-1 and:								
Aged under 30	–0.491	–0.230	–0.717	–0.681	0.121	–0.751	–0.334	–0.393
	[2.70]	[0.54]	[2.84]	[4.22]	[0.45]	[5.66]	[1.92]	[2.80]
Aged 30-44	–0.058	–0.170	–0.250	–0.315	0.322	–0.479	–0.263	–0.215
	[0.45]	[0.93]	[1.54]	[2.72]	[1.72]	[4.95]	[2.07]	[2.03]
High education	–0.123	0.098	–0.017	0.441	–0.088	–0.398	–0.315	0.049
	[0.95]	[0.45]	[0.06]	[3.18]	[0.36]	[3.24]	[1.44]	[0.42]
Medium education	–0.063	0.076	–0.143	0.386	–0.211	0.187	–0.112	–0.267
	[0.36]	[0.36]	[0.58]	[3.29]	[1.12]	[2.04]	[0.64]	[2.42]
Home owner	0.330	0.230	0.011	0.197	–0.579	0.085	0.181	0.222
	[2.39]	[1.25]	[0.07]	[1.67]	[1.82]	[0.89]	[1.46]	[1.92]
Limiting health	–0.186	–0.115	0.113	–0.036	0.026	–0.170	–0.465	0.002
	[0.78]	[0.46]	[0.68]	[0.17]	[0.08]	[0.92]	[2.87]	[0.01]
Unemployed 5 yrs	–0.433	–0.241	–0.290	–0.414	–0.617	–0.568	–0.714	–0.513
	[3.19]	[1.03]	[1.67]	[3.49]	[3.24]	[5.48]	[4.84]	[5.23]
Unemployment rate	0.032	0.071	–0.098	0.018	0.027	0.013	–0.080	–0.014
	[0.98]	[1.02]	[1.68]	[0.88]	[0.97]	[0.87]	[2.72]	[1.57]
Rho	0.376	0.080	0.304	0.488	0.487	0.426	0.467	0.460
Chi^2 (interactions=0)	33.24	6.66	17.92	45.98	17.01	105.07	54.28	64.38
P-value	0.0001	0.5735	0.0218	0.0000	0.0300	0.0000	0.0000	0.0000
Log-likelihood	–1956	–667	–1390	–2670	–1089	–4066	–2334	–3518
N observations	15464	17315	20800	15483	9909	27957	16915	23229
N individuals	3287	4233	4732	3584	2521	6399	3736	5631

Notes: Dynamic random effects probit estimates where dependent variable takes value 1 if a man is self-employed at *t*, and zero otherwise. Absolute value of coefficient divided by standard error in brackets. All models also include variables as in Table 13, time dummies and means of time-varying covariates over time to allow for correlation between observables and unobservables – see text for details.