

Centre for  
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CEBR

Discussion Paper

2005-17

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# Defining and Measuring Entrepreneurship

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This version, August 24, 2005

*Abstract:* Although entrepreneurship has become a buzzword in the public debate, the concept is often used without a precise definition. In this paper, we review the different concepts used in the theoretical literature and discuss their connection to the various empirical measures of entrepreneurship. We argue that entrepreneurship is probably best considered a multifaceted concept and that the different empirical measures reflect different aspects of entrepreneurship. As a consequence, in a cross-country comparison of entrepreneurship, we find that the relative ranking of countries depends crucially on the indicator used.

*Keywords:* Entrepreneurship, Definitions, Measurement, Cross-country Comparison

*JEL:* B10, J2, M13, O3

The authors gratefully acknowledge the financial support for this project from the Danish National Agency for Enterprise and Construction.

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# 1. Introduction

“Entrepreneurship” has become a buzzword in the public debate in recent years. It is extensively referred to by policy-makers as one of the roads to future prosperity. However, the concept is often used without a precise definition. So what do we really understand by “entrepreneurship”? And how “entrepreneurial” are different countries?

When we see a person like Bill Gates, we all agree that we are looking at an entrepreneur. But what about the man who buys a 15-year old car and starts a small taxi business on the outskirts of Mexico City, is he also an entrepreneur? Or the Middle Eastern immigrant who opens up a small corner shop in Berlin because he was unable to find paid employment. Is he an entrepreneur? In the last two cases, we might start to disagree. At least, it is no longer clear why such “entrepreneurs” should hold the key to future prosperity.

When we look at the data, we do not find many observations like Bill Gates. Instead, we find plenty of taxi drivers and corner shops. Hence, if we want to construct empirical measures of entrepreneurship, it is obviously very important how we choose to define entrepreneurship and thus whom to include in this category.

We may need to think harder about exactly what it was that led us to conclude in the first place that Bill Gates is an entrepreneur. Is it because, he is managing or owning a huge cooperation? Is it because his company has exhibited impressive growth rates, thereby creating thousands of jobs? Is it because his company builds on his own innovative ideas? Or is it something else?

To answer these questions, it may be instructive to take a look at some of the historical and some of the more recent contributions to the economic theories of entrepreneurship. A number of authors have presented rather different definitions of the entrepreneur since the first ideas on entrepreneurship were formulated by Cantillon in the middle of the 18<sup>th</sup> century. Although 250 years have passed since then, a coherent definition has not yet been agreed upon. While this is bound to complicate theoretical discussions on these

issues, the empirical studies also suffer from the lack of a clear theoretically founded definition. As a consequence, numerous different measures of entrepreneurial activity are used in practice.

The first purpose of this paper is to review the different concepts used in the theoretical literature, including the classical contributions by Knight and Schumpeter. What are the central aspects of entrepreneurship and what is the role of the entrepreneur in economic theory? While we show that a consensus has not yet emerged, we argue that entrepreneurship is probably best considered a multifaceted concept. This in turn requires researchers to be precise about which aspect is considered in a given context.

The second purpose is to present and discuss some of the most commonly used indicators of entrepreneurial activity in the empirical literature and to relate these to the existing theoretical concepts. What are the differences and do they matter? Which aspects of entrepreneurship are the different indicators measuring? Based on these insights, we try to compare entrepreneurial activity across a number of EU countries using data from the European Community Household Panel (Eurostat, 2001).

## **2. Defining Entrepreneurship**

In this section, we compare different definitions and interpretations of entrepreneurship. Our intention is to give a brief overview of the literature. For a comprehensive survey, the interested reader is referred to Barreto (1989) or Hebert and Link (1988). Starting with some of the classical contributions by Cantillon, Say and Marshall, we move on to discuss the perhaps more well-known definitions of Schumpeter and Knight. In light of these, we look at the role of the entrepreneur in formal economic models. Finally, we review some recently applied definitions of entrepreneurship in order to determine whether a consensus has emerged.

## 2.1 Early Definitions

According to van Praag (1999), Richard Cantillon was the first economist to acknowledge the entrepreneur as a key economic factor in his posthumous “*Essai sur la nature du commerce en général*” first published in 1755 (Cantillon, 1959).

Cantillon saw the entrepreneur as responsible for all exchange and circulation in the economy. As opposed to wage workers and land owners who both receive a certain/fixed income or rent, the entrepreneur earns an uncertain profit from the difference between a known buying price and an uncertain selling price (Hébert and Link, 1988). The defining feature of the entrepreneur is therefore the uncertainty.

Later, Jean-Baptiste Say (1767-1832) extended this interpretation of the entrepreneurial task (Say, 2001). Say saw the entrepreneur as the main agent of production in the economy. In fact, rather than emphasising the risk-bearing role of the entrepreneur, Say stressed that the entrepreneur’s “...principle quality is to have good judgment.” (Hébert and Link, 1988, pp 38). Hence, with Say, the entrepreneur was for the first time regarded as a manager of a firm<sup>2</sup>.

In his “Principles of Economics” the early neoclassical economist, Alfred Marshall, also devoted attention to the entrepreneur. In addition to the risk bearing and management aspects emphasised by Cantillon and Say, Marshall (1964) introduced an innovating function of the entrepreneur by emphasising that he continuously seeks opportunities to minimise costs.<sup>3</sup>

While these early contributions all added dimensions to the picture of the entrepreneur, none of them developed a comprehensive theory of entrepreneurship. For this, we must turn to the contributions by Schumpeter and Knight in the first half of the 20<sup>th</sup> century.

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<sup>2</sup> Hébert and Link (1988) argue that contrary to other definitions, Say’s entrepreneur does not move the economic system or act on opportunities created by risks and uncertainty. Instead, he acts in the static world of equilibrium, where he assess the most favorable economic opportunities. The payoff to the entrepreneur is not a profit arising from risk-bearing but instead a wage accruing to a scarce type of labour.

<sup>3</sup> Hébert and Link (1988) argue that Marshall’s view on the entrepreneur changed over his life. The cost minimisation aspect of the Marshallian theory is emphasized by van Praag (1999).

## 2.2 Schumpeter and Knight

Joseph Schumpeter presented most of his ideas on entrepreneurship in his book *The Theory of Economic Development* published in 1911 (Schumpeter, 1949). Schumpeter opposed the existing views of the entrepreneur as a risk bearer and a manager of a company. Instead, Schumpeter argued that an entrepreneur is an *innovator* – an individual who carries out one of the following five tasks: 1) the creation of a new good or a new quality; 2) the creation of a new method of production; 3) the opening of a new market; 4) the capture of a new source of supply; or 5) the creation of a new organization or industry (Schumpeter, 1949, p. 66). The entrepreneurial task is thus to *identify* new combinations and react to these by exercising the leadership to profit from them. It should be stressed that it is the task of “carrying out new combinations” which is entrepreneurial and therefore the exercise of leadership to accomplish this is also part of the entrepreneurial activity. However, leadership of a company is not in itself entrepreneurial. Note also that the entrepreneur is not (necessarily) the one who invents new combinations but the one who identifies how these new combinations can be applied in production (Schumpeter, 1949)

An illustration of the entrepreneurial role vs. the managerial role can be given in terms of the production function. Where the manager combines the input factors in the production function to achieve the highest technical efficiency, the entrepreneur shifts the production function outwards by his innovations. The entrepreneur is the one who moves the system out of the static equilibrium.<sup>4</sup> In this disequilibrium, new products or production methods are created thereby rendering others obsolete. This is Schumpeter’s well-known process of “creative destruction” which he saw as the driving force behind economic development (Schumpeter, 1949).

The other main theory of entrepreneurship in the early 20<sup>th</sup> century was developed by Frank Knight in his *Risk, Uncertainty and Profit*, first published in 1921 (Knight, 1971).

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<sup>4</sup> Contrary to Schumpeter, Schultz (1975) defines entrepreneurship as the ability to deal with disequilibria and so entrepreneurship is the equilibrating factor in the economy.

According to Knight, the main function of the entrepreneur is to assume the uncertainty associated with unique situations, *e.g.*, a shift in consumer taste, thereby shielding all other parties against the uncertainty.<sup>5</sup> The entrepreneur must therefore exercise judgement over these unique situations, *i.e.*, the uncertainty in the economy.

Later, Knight (1942) specified three concrete functions of the entrepreneur: i) leadership in changes and innovations; ii) adaptation to changes; and iii) risk bearing in connection with unforeseen events. These are three different but closely related entrepreneurial functions all involving uncertainty bearing. The innovative entrepreneur disturbs the economic system by initiating changes or innovations. The managing entrepreneur adapts to the new economic situation while the uncertainty-bearing entrepreneur assumes the risk involved in the process.

The main difference between Knight's and Schumpeter's views on entrepreneurial activity is their view on uncertainty. Knight argues that the key role of the entrepreneur is to assume uncertainty. This is very much in line with the early contributions. Schumpeter, on the other hand, leaves the uncertainty bearing to the banker.

Since uncertainty bearing and ownership walk hand in hand, a business owner is a Knightian entrepreneur.<sup>6</sup> This contrasts with Schumpeter who explicitly emphasises the difference between the entrepreneur and the capitalist. Schumpeter argues that the entrepreneur is a leader of men but the entrepreneurial activity is innovation *i.e.* the creation of new combinations.

The Schumpeterian approach is to start with the definition of entrepreneurship making entrepreneurs the individuals who perform the entrepreneurial function. Contrary to this

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<sup>5</sup> Note that this type of uncertainty is different from the one arising from uncertain events, such as house burglary, car accidents etc. This latter kind of uncertainty – or “risk” as Knight calls it – can be insured because it occurs regularly.

<sup>6</sup> However, the reverse is not true. Not all entrepreneurs are business owners. A manager can be entrepreneurial, but this requires that her judgment is subject to uncertainty and that she assumes the responsibility for possible errors (Hébert and Link, 1988).

the Knightian approach is to focus on the person (the entrepreneur). Entrepreneurship is then the task performed by this individual.

The social gain from entrepreneurship also differs between Schumpeter and Knight. Schumpeter sees the entrepreneur as the prime mover of the economic system. In Knight's world, on the other hand, the entrepreneur is the bearer of uncertainty. His role is to insure the rest of society against the consequences of unique events.

Even though the differences between Knight's and Schumpeter's theories of entrepreneurship are apparent, there are also some similarities. They both emphasise the innovation aspect. To Knight, however, this is only one aspect of entrepreneurship. The defining feature of the activity is the underlying uncertainty.

Casson (2003) tries to encompass both the Schumpeterian and the Knightian definitions by arguing that entrepreneurs are individuals who specialise in decision making. The Schumpeterian entrepreneur uses new inventions to create new combinations. He applies information about these inventions to create more profitable production patterns and products. The Knightian entrepreneur uses information about the current state of the world to assess the unique situations arising in the future. Moreover, he takes decisions about how to exploit these situations to make a profit.

According to Casson (2003), the entrepreneurial activity is, thus, to specialise in making judgmental decisions.<sup>7</sup> However, while it is true that both the Knightian and the Schumpeterian entrepreneurs are decision makers, many decision makers are not entrepreneurs according to their theories.

## **2.4 The Entrepreneur in Economic Modelling**

With the neoclassical theory came a greater focus on optimising behaviour by firms and consumers. Baumol (1968) has argued that this left no room for the entrepreneur in the neoclassical model of the firm, as the firm became a passive optimiser given the

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<sup>7</sup> A similar definition is found in Hébert and Link (1988) who also focus on judgmental decision making.

exogenous constraints; an activity which does not require entrepreneurial initiative – at least not in the Schumpeterian sense.

Instead, the entrepreneur has appeared in the shape of the self-employed or business owner in models of occupational choice. Hence, the focus of this literature seems to be on the Knightian approach to entrepreneurship.<sup>8</sup> In these models, the entrepreneurial characteristic has been modelled in different ways. A number of papers have assumed that individuals are heterogeneous with respect to “entrepreneurial ability” modelled either as a parameter in the cost function, as in Jovanovic (1982) and Brock and Evans (1986), or as a parameter in the production function, see Lucas (1978), Calvo and Wellisz (1980), Lazear (2004), and Buera (2003). Lazear (2004) actually models entrepreneurial ability as an consequence of balanced rather than specialised skills.

In de Meza and Southey (1996), a model is presented where individuals have identical abilities, but where those who are overly optimistic become entrepreneurs. Hence, the entrepreneurial feature is not ability as such but the *perception* of ability. In Otani (1996), the entrepreneurial (managerial) ability is modelled as an endogenous choice of the company. In his framework, managers are hired as apprentices and the longer they remain apprentices, the more able they become.

A different strand of the literature focuses on the risk attitudes of agents. In these papers, entrepreneurs are characterised by a smaller degree of risk aversion, see Kihlstrom and Laffont (1979) and Kanbur (1979).

In sum, the entrepreneurial feature in these models ranges from an unspecified cost or production advantage – which could reflect managerial but also innovative skills – to greater ability or willingness to bear uncertainty.

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<sup>8</sup> The endogenous growth theory has made some progress at modeling Schumpeterian entrepreneurship. However, the entrepreneurial activity is modeled as innovations arriving according to a Poisson process and is, thus, exogenous see e.g., Aghion and Howitt, (1997).

## **2.5 Has a Consensus Emerged?**

Most recent empirical analyses of entrepreneurship devote very limited space – if any – to define entrepreneurship. This would seem justified provided that a consensus had arisen in this area. However, as we argue below, this does not seem to be the case.

To illustrate our point, we have picked four definitions recently applied by OECD. In OECD (1998), entrepreneurship is defined as “... the ability to marshal resources to seize new business opportunities...” (p. 41). In OECD (1997), on the other hand, entrepreneurship is defined as “the dynamic process of identifying economic opportunities and acting upon them by developing, producing and selling goods and services” (p. 151). In OECD (2001a), entrepreneurship is defined as simply being self-employment: “... an entrepreneur is anyone who works for himself or herself but not for someone else...” (p. 23). In yet another OECD publication (OECD, 2001b), we find: “The concept of entrepreneurship generally refers to enterprising individuals who display the readiness to take risks with new or innovative ideas to generate new products or services.” (p. 89).

Obviously, these definitions emphasise different aspects of entrepreneurship. The first definition focuses on the ability to “marshal resources” which requires command over these resources. This in turn hints at some sort of ownership/management or even risk-bearing. The owner aspect is even more central in the third definition. The second definition, on the other hand, is much closer in spirit to Schumpeter’s innovative entrepreneur as the focus is on activities rather than the resources needed to carry them out. The fourth definition emphasises the Knightian risk bearing, although only in combination with new or innovative ideas.

In sum, aspects of risk bearing, innovation as well as management are reflected in these definitions. Although OECD and other agencies have issued comprehensive reports describing and analysing entrepreneurship in different countries, a consensus has obviously not emerged.

## **2.6 Discussion**

“Entrepreneurship” is frequently advocated in the public debate as a key economic factor. However, often we do not know the precise meaning of the word. In this section, we have tried to look at different uses of the word in the economic literature – including the classic definitions, the usage in formal models, and some recently applied definitions by OECD. The lack of consensus is obvious.

Already in the old (pre-1900) literature, many functions were assigned to the entrepreneur, including risk-bearing (Cantillon), management (Say), and innovation (Marshall). Schumpeter confined the role of the entrepreneur to that of innovative activities, whereas Knight stressed the risk-bearing aspect and hence the entrepreneur’s responsibility as an owner or a manager of a firm. The formal models yield an equally blurred picture of the entrepreneur. OECD has not even settled for a single definition.

We are led to conclude that entrepreneurship is probably best considered a multifaceted concept, involving innovation, risk-bearing, and management. A single definition contained in one sentence can hardly capture all entrepreneurial activity in a society and still be meaningful. This in turn requires researchers to be precise about which aspect of entrepreneurship is considered in a given context.

Fortunately, this may explain our initial confusion. Bill Gates is an owner/manager, he is innovative and he bears considerable risk. Hence, independently of how we perceive entrepreneurship, he is likely to stand up to our definition. Turning to the taxi driver and the corner shop, they are both risk bearers and hence entrepreneurs in a Knightian sense. However, the management – and especially the innovative – aspect is much more limited in these cases.

## **3. Measuring Entrepreneurship**

Given the lack of a theoretically based definition, can we then hope to measure entrepreneurship? At least, the many dimensions of entrepreneurship make it almost impossible to measure or even compare the overall levels of entrepreneurship in different

countries. However, we may be able to identify some of the dimensions of entrepreneurship by analysing different indicators of entrepreneurship available in the literature. The aim of this section is to present a number of different indicators of entrepreneurship. We relate these indicators to the theoretical discussion and analyse which aspects of entrepreneurship they measure. Finally, a group of indicators are used to compare entrepreneurship across a group of EU countries based on data from the European Community Household Panel (ECHP).<sup>9</sup>

The measures used in the literature for comparing entrepreneurship across countries can be roughly divided into two groups according to the unit of account. First, indicators at the individual level are derived from individual characteristics such as self-employment or business ownership. Second, indicators at the business-level are based on firm statistics, such as business entry and exit rates.

In the Knightian world, entrepreneurship is a characteristic of the individual, which, *a priori*, makes indicators based on individual level data the most appropriate for measuring this kind of entrepreneurship. Furthermore, the use of *individual-level* indicators has been spurred by the fact that consistent and comparable measures across countries can be obtained from household surveys. Implicitly recognising this focus on Knightian entrepreneurship, the empirical literature has more recently turned to *business-level* data to get a better picture of, in particular, the Schumpeterian entrepreneurship.

A relevant question is therefore whether we can also capture other aspects of entrepreneurship, in particular the innovative aspect, by modifications of the existing individual-level measures. An advantage of indicators of Schumpeterian entrepreneurship based on individual-level data is the comparability between countries which these data offer. Thus, besides presenting the individual-level indicators already in use, we introduce some additional – more disaggregate – indicators which may better capture the Schumpeterian approach to entrepreneurship.

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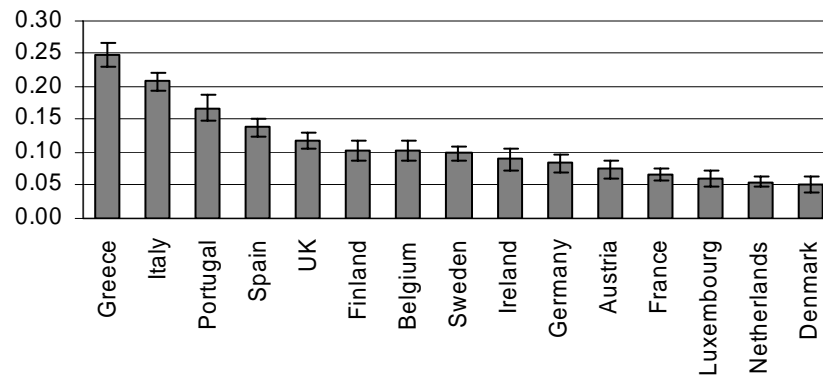
<sup>9</sup> The ECHP database is described in the appendix.

### 3.1 The Self-employment Rate

The starting point of individual level measures is the rate of self-employment, defined as the number of self-employed relative to the labour force.<sup>10</sup> This measure has been used to compare entrepreneurship across countries by, *e.g.*, Blanchflower (2000), OECD (1998) and OECD (2000).<sup>11</sup> The extensive use of the self-employment rate is partly motivated by similarity of definitions across countries (Audretsch, 2002).

Figure 1 presents the non-agricultural self-employment rate for the countries in ECHP. Two distinct patterns can be observed in the Figure. First, the Mediterranean countries tend to have the largest self-employment rates. Second, the countries of Central Europe are all found below or at the median. On the other hand, no distinct picture emerges with respect to the Nordic and the Anglo-Saxon countries.

**Figure 1: Non-agricultural self-employment share of labour force in 2001 (ECHP).<sup>12</sup>**



*Note:* The labour force is restricted to contain only individuals aged 25 to 60 to minimise national effects of education and early retirement schemes. As in most empirical work, we exclude the agricultural sector because this sector is characterised by many self-employed and performance may be distorted by subsidies. Furthermore, Swedish entrepreneurs working less than 15 hours per week are not present in our sample and our estimate, thus, offers a downward biased estimate of the Swedish self-employment rate. The error bars illustrates the 95% confidence interval of the estimated self-employment rate using the sampling weight assigned to each individual in the ECHP database. It should be noted that ECHP is a survey based database. Hence, the characterisation of individuals as self-employed is not necessarily in accordance with *e.g.* the OECD definition (see below).

<sup>10</sup> Blanchflower (2000) notes that the self-employment rate is not estimated consistently in the literature. Le (1999), for instance, analyses the proportion of self-employed in paid employment instead of in the labour force.

<sup>11</sup> In addition, a huge literature on the determinants of self-employment in individual countries or regions uses this measure; see Le (1999) for an overview.

<sup>12</sup> The appendix provides a detailed table of annual self-employment rates for the period 1994-2001. We find that the self-employment rates are generally rather stable and Figure 1 is, thus, representative for the self-employment rates for the period 1994-2001.

Estimates from Blanchflower (2000), Le (1999), OECD (1998) and OECD (2000) support the pattern in Figure 1. However, these studies use the OECD Labour Force Statistics which include additional countries like the US and Norway. The self-employment rate in the US economy ranges from 0.068 to 0.082 in the period 1993 to 1998. Thus, in terms of the self-employment rate, the US economy does not appear especially entrepreneurial.

The OECD Labour Force Statistics define individuals as self-employed if they work for profit or family gain given in cash or in kind, whereas employees work for a wage or a salary, cf. OECD (2005).<sup>13</sup> Hence, the crucial difference between self-employment and employed work lies in the type of remuneration received, where the self-employed remuneration is uncertain. In his role as residual claimant, the Knightian entrepreneur assumes all the uncertainty connected with the firm, thereby leaving other parties insured. Hence, the definition of self-employment in the OECD Labour Force Statistics is closely related to the definition of a Knightian entrepreneur, although it should be noted that the self-employed are only a subset of the Knightian entrepreneurs in the economy. As an example, the OECD definition does not capture *owner-managers* of incorporated businesses or large shareholders working as employees.<sup>14</sup>

To address the problem of owner-managers, Audretsch and Thurik (2001) use an international data set of business owners.<sup>15</sup> The inclusion of these, however, does not change the conclusions drawn from Figure 1 apart from the fact that Belgium and the Netherlands are found to be relatively more entrepreneurial.

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<sup>13</sup> The OECD definition seems to indicate that unpaid family workers should be characterised as self-employed because they work for family gain. However, OECD (1998 and 2000) exclude these. Blanchflower (2000) reports huge differences across countries in the share of unpaid family workers out of the total number of self-employed. In our estimates, we exclude the unpaid family workers.

<sup>14</sup> Individuals with a job in an incorporated business who have ‘controlling ownership of the enterprise’ are defined as *owner-managers* by OECD (2000). In principle, all individuals who own (shares in) a business are entrepreneurs in the Knightian sense. However, for practical purposes, we must require that an owner faces substantial risk in order to be characterised as a Knightian entrepreneur.

<sup>15</sup> EIM Business & Policy Research (EIM) has corrected the OECD labour force database to facilitate cross-country comparison by attempting to estimate the number of owner-managers of incorporated enterprises in countries where these are not identified, see van Stel (2004). Note that EIM includes only incorporated enterprises with less than 50 employees in the measure of business-owners. Furthermore, unpaid family workers and ‘side-owners’ are excluded in this database.

Taken at face value, the definition of the self-employment rate allows no inference to be drawn about Schumpeterian entrepreneurship. Remember that according to Schumpeter, entrepreneurs are individuals engaged in one or more of the five tasks mentioned in Section 2. Nothing guarantees that individuals working for profit or family gain are engaged in these tasks. The self-employment rate is a stock measure and therefore has difficulty reflecting Schumpeterian entrepreneurship which, in essence, is a process of change.

### **3.2 Modifications of the Self-employment Rate**

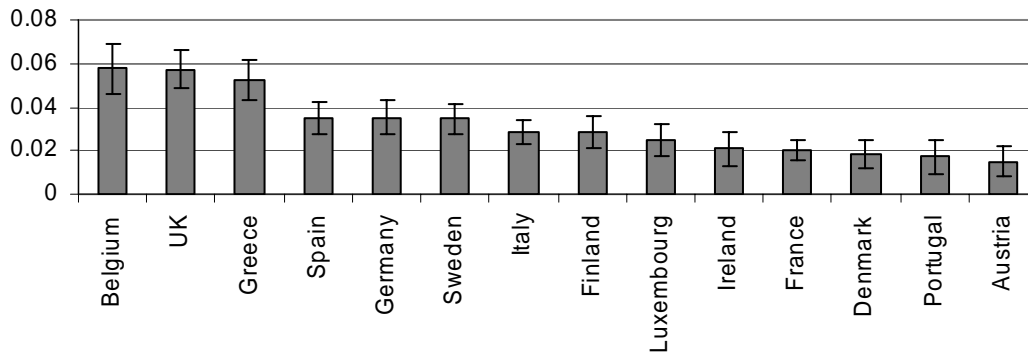
Below, we propose some indicators based on disaggregations of the self-employment rate. The relevance of this has been suggested by, *e.g.*, Blanchflower (2000). Because the raw self-employment rate is a measure of Knightian entrepreneurship, we have tried to construct some alternative indicators which may better reflect the level of Schumpeterian entrepreneurship in the economy.

The Schumpeterian entrepreneur is an innovator; something we would expect to be fostered by human capital. It thus seems reasonable to assume that individuals with higher skill levels have greater potential for innovation, since they are better equipped at identifying and more capable of exploiting new business opportunities.<sup>16</sup>

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<sup>16</sup> Some support for this assumption is given in Audretsch (2002). He reports that growth rates of companies are positively linked to the human capital of the founder, especially within innovative sectors.

**Figure 2: High-skilled self-employment rates in 2001 (ECHP)**



*Note:* See Figure 1. High-skilled individuals are defined as those with tertiary education corresponding to ISCED 5-7. The labour force is restricted to contain only individuals with an observed educational category. Furthermore, the high-skilled self-employment rate is calculated as the share of self-employed with higher education relative to this restricted labour force. The Netherlands is excluded due to few observations on individuals with a tertiary education – more specifically we find a structural break in the high-skilled self-employment rate between 1997 and 1998, see the appendix. The Netherlands was in 1997 situated between Portugal and Denmark with a high-skilled self-employment rate of 0.016. See the appendix for a detailed table of annual high-skilled self-employment rates for the period 1994-2001.

The only available measure of human capital in our sample is the level of education. Figure 2 therefore presents the high-skilled self-employment rate defined as self-employed with tertiary education relative to the labour force. This indicator suggests different conclusions compared to those drawn from the raw self-employment rate in Figure 1. The relative position of the Mediterranean countries decline with Portugal now being one of the least entrepreneurial countries in the sample. The positions of the Central European countries are now also more scattered with Belgium and Germany as some of the most entrepreneurial but Austria and France as some of the least entrepreneurial.

A problem with this indicator is that some highly educated self-employed could be performing non-innovative functions. For example, professionals like doctors, dentist, lawyers and accountants, may not be particularly innovative but are still included in this measure. Therefore, conditioning the raw self-employment rates on educational attainment is not the optimal way of identifying innovative activities. However, it is our belief that the measure tend to ameliorate the identification of the Schumpeterian entrepreneur, as a great proportion of the non-innovative entrepreneurs are dropped. To get an alternative picture, we look at the self-employment rate in different sectors. Using

a standard classification, we find that self-employment rates are quite similar in the industry and service sectors as illustrated in Table 1. Hence, this does not change the general conclusion drawn from Figure 1.

We then turn to a sector classification based on skill intensities. If innovative or entrepreneurial activities are concentrated or particularly important in skill-intensive sectors, then it is perhaps more interesting to look at self-employment rates in these sectors. Compared to the previous indicator, we do not require the self-employed to have a certain educational level. Instead, we require that they work in a sector where the skill-intensity is high.

**Table 1: Self-employment in different sector classifications, 2001 (ECHP).**

	SE	Industry	Service	Low-skilled	High-skilled
Greece	0.332	0.307	0.347	0.375	0.193
Italy	0.313	0.216	0.396	0.334	0.263
Portugal	0.224	0.167	0.289	0.252	0.124
Spain	0.196	0.130	0.251	0.229	0.124
UK	0.155	0.152	0.157	0.181	0.118
Sweden	0.142	0.106	0.170	0.156	0.120
Belgium	0.136	0.109	0.160	0.175	0.075
Finland	0.127	0.092	0.163	0.144	0.095
Ireland	0.123	0.125	0.122	0.138	0.094
Germany	0.103	0.063	0.152	0.102	0.104
Austria	0.092	0.051	0.129	0.091	0.094
France	0.078	0.074	0.081	0.100	0.043
Luxembourg	0.078	0.052	0.089	0.091	0.058
Netherlands	0.066	0.064	0.067	-	-
Denmark	0.063	0.057	0.070	0.077	0.046

*Note:* See Figure 2. The labour force is restricted to include only self-employed and wage workers as unemployed individuals are not affiliated with a sector. Individuals working in public sectors like public administration, education, health and social work are dropped. In addition, individuals with no sector information are excluded.

Using a 17-sector classification and dropping four sectors corresponding to public sector activities, the skill-intensive sectors were chosen as the five sectors with the largest skill-

intensity across countries.<sup>17</sup> As seen in Table 1, the self-employment rates in the low-skilled sectors turn out to be closely related to the overall self-employment rates.<sup>18</sup>

When it comes to self-employment in the high-skilled sectors, a number of points are worth stressing. First, while the relative position of the countries is almost unchanged, the absolute differences are smaller when using self-employment in high-skilled sectors as our indicator because the level of self-employment in high skilled sectors is generally lower. Second, we observe that the differences between self-employment in low and high-skilled sectors vary across countries.

In relative terms, Belgium and France have some of the largest fractions of self-employment in the low-skilled sector, whereas the opposite applies to Germany and Austria. This is an interesting result given that the overall self-employment rates do not differ substantially between the four countries. Looking at the data, we see that the low-skilled rates are similar but that Belgium and France have less than half the self-employment rate in the high skilled sector (compared to the low-skilled self-employment rates). Moreover, it is interesting to note that some of the most entrepreneurial countries, Greece or Portugal, have a larger discrepancy between self-employment rates in the two sectors than most other countries.

### **3.3 Other Indicators**

The different self-employment rates presented so far are all stock measures. An alternative group of indicators are based on *changes* in self-employment, *i.e.* transition measures. While stock measures are closer to the Knightian interpretation, transition or flow measures are more in the spirit of the Schumpeterian innovative entrepreneurship, as they reflect “changes”.

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<sup>17</sup> The skill-intensity of a sector is calculated as the share of highly educated individuals in total employment in the sector, relative to the share of highly educated in the total workforce. In order to characterise the most skill-intensive sectors across the ECHP countries, we need to have a comparable measure of this. As a result, each sector’s skill-intensity is normalized by the national skill-intensity to sort out different educational level among the countries.

<sup>18</sup> The appendix provides a detailed table of the low- and high-skilled self-employment rates for the years 1994 to 2001.

The most basic measures are the entry and exit rates into and out of self-employment as used in OECD (2000). Schumpeter actually saw the formation of a new business as the most typical case of a new combination (van Praag, 1999). This makes the entry rate a natural indicator of Schumpeterian entrepreneurship.

**Table 2: Pooled entry and exit rates, 1994-2001.**

	Raw				High-skilled			
	entry		exit		entry		exit	
Austria	0.136	(8)	0.131	(7)	0.022	(11)	0.010	(13)
Belgium	0.095	(13)	0.071	(14)	0.038	(7)	0.027	(7)
Denmark	0.177	(3)	0.161	(4)	0.080	(2)	0.053	(3)
Finland	0.125	(11)	0.133	(6)	0.042	(5)	0.040	(4)
France	0.071	(14)	0.082	(13)	0.019	(13)	0.014	(11)
Germany	0.172	(4)	0.153	(5)	0.071	(3)	0.062	(2)
Greece	0.112	(12)	0.123	(9)	0.028	(10)	0.024	(8)
Ireland	0.129	(10)	0.111	(12)	0.028	(9)	0.016	(10)
Italy	0.142	(7)	0.121	(10)	0.020	(12)	0.014	(12)
Luxembourg	0.194	(2)	0.114	(11)	0.064	(4)	0.034	(5)
Netherlands	0.245	(1)	0.191	(1)	0.029	(8)	0.022	(9)
Portugal	0.134	(9)	0.128	(8)	0.015	(14)	0.009	(14)
Spain	0.168	(6)	0.170	(3)	0.040	(6)	0.033	(6)
UK	0.170	(5)	0.176	(2)	0.081	(1)	0.083	(1)

*Note:* The entry (exit) rate is calculated as the ratio of individuals entering (exiting) self-employment relative to the stock of self-employment in the previous period. ( ) indicates a country's relative position within a column. The entire population is used to calculate these transition measures, i.e. we add 'non-employed' to the labour force. The agricultural sector and individuals with no information regarding last period's employment status are dropped in our sample. Sweden is excluded because of unreliable estimates caused by a large attrition in the database and the lack of the retrospective variables. The high-skilled entry (exit) rate is defined as individuals with a third level education making a transition into (out of) self-employment relative to the labour force (with an educational category). See the appendix for annual entry (exit) rates and standard errors on the estimates. We present the pooled estimates of the transitions as the annual rates vary a lot.

Table 2 shows the entry and exit rates and the disaggregated measures of high-skilled transition rates based on the ECHP data. Compared to the previous sections, the picture is changed substantially when using a simple dynamic indicator of entrepreneurship. Especially the Mediterranean countries – which were the most entrepreneurial countries when it came to the static measures – have only a limited amount of entrepreneurship according to the transition measures (except Spain). The Mediterranean countries drop even further if we use high-skilled entry and exit as the indicator for entrepreneurship. Interestingly, Denmark is the most entrepreneurial country by the transition measures, while it was one of the least entrepreneurial countries when using the self-employment rate as an indicator.

Another indicator which reflects the dynamic approach to entrepreneurship is the the Total Entrepreneurial Activity (TEA) index computed by the Global Entrepreneurship

Monitor (GEM), cf. GEM (2000). The measure is determined as the share of the adult population engaged in creating an enterprise within a given time period. Compared to the entry rates from self-employment, an advantage of the GEM surveys is that the issue of owner-managers of incorporated businesses may be minimised as the surveys focus on all individuals engaged in the start-up phase.

Some of the empirical evidence used in OECD (2001b and 2001c) is based on a TEA index with individuals engaged in start-ups less than *a year* old. OECD (2001c) characterises this indicator as the *start-up* activity, whereas the 42-months TEA index (see below) is referred to as the *new business* activity. According to the TEA 12-months measure, Germany followed by Italy and Spain are the most entrepreneurial among the countries in the ECHP.

An extended measure is used in GEM (2000) which includes 18-64 years-old individuals *managing* a business less than 42 months old. Using this measure, Italy, UK and Germany are the most entrepreneurial countries. Hence, we get approximately the same results, whether we use the TEA index with a time frame of 12 or 42 months. It should be noted, however, that these results differ slightly from the self-employment entry and exit rates reported in Table 2, as, *e.g.*, Denmark is relatively less entrepreneurial when using the TEA index, while Italy is more entrepreneurial. A possible explanation for this is that Danish entrepreneurs have a larger tendency to start out as self-employed while their Italian counterparts tend to start an incorporated business instead.

In sum, the use of more dynamic measures of entrepreneurship changes the picture compared to that from the static indicators. Greece, consistently one of the most entrepreneurial countries in the previous section, has a low degree of entrepreneurship according to the dynamic measures.

### **3.4 Business-Level Measures**

As noted above, the individual-level measures used for comparing entrepreneurship in the literature are best at capturing Knightian entrepreneurship with their focus on the stock of

self-employed. In contrast to this, the business-level measures used in the literature are more focussed on dynamics. We may, thus, interpret the move towards the use of business-level measures as an attempt to better capture the Schumpeterian aspect of entrepreneurship. An advantage of using business-level measures instead of individual-level measures is that they include not only sole proprietors but also incorporated businesses.<sup>19</sup>

Birth and death rates and the sum (turnover) and difference (net birth) are common business level indicators used by, e.g., Eurostat (2004) and OECD (1998). As we argued in the previous section, these dynamic indicators are all focused on Schumpeterian entrepreneurship. The birth of a new business is one of the five entrepreneurial tasks, while exit and turnover rates can be seen as measures the degree of creative destruction, *i.e.* the outcome of the entrepreneurial process.

On a theoretical ground, the indicators thus seem promising, but when turning to the data a number of problems emerge. For instance it is difficult to find out whether an entry is in fact a new firm or the result of a merger etc. The flipside of this is that death rates are equally difficult to quantify. An additional problem is that entry rates only capture one of the five entrepreneurial tasks, as a consequence, that equal entry rates across countries need not imply equal degrees of innovation. Furthermore, exit and turnover rates are only rough proxies for the creative destruction process since, for instance, the destruction of obsolete products or markets also reflect creative destruction.

Other measures focus on growth or survival of new firms. The ratio of “gazelles”, defined as new growth businesses to the total number of businesses in the economy, has been used to characterise entrepreneurship; see, e.g., Birch (1999). Moreover, Eurostat (2004) uses the survival rate to reflect the degree of entrepreneurship. The theoretical foundation of these measures is rather limited as can be seen by reviewing the five entrepreneurial tasks.

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<sup>19</sup> Eurostat (2004) reports that sole proprietors constitute 59.8 per cent of active businesses.

Gazelles are conceptually the same as the self-employed applied to business level measures. The presumption is that gazelles are more entrepreneurial than other businesses making the ratio of gazelles to “regular” businesses an indicator of entrepreneurship. A serious qualification arises. Schumpeter argues that growth is an outcome of creative destruction which, in turn, is the outcome of entrepreneurship. This gives an argument for the use of gazelles as an indicator. However, by the same reasoning we can use growth in GDP per. capita or another aggregate measure as our indicator of entrepreneurship. These are much more reliably estimated across countries. However, one should be careful when trying to measure entrepreneurship by an outcome (such as growth) which could be the result of numerous other factors.

The survival rate has similar theoretical difficulties. It is uncertain whether a large survival rate is an indicator of more or less entrepreneurship. It is true that a longer survival rate could be an indication of a more innovative entrepreneur. However, a low survival rate could also be caused by the fact that the economy is highly entrepreneurial.

The ECHP database is not suited for cross-country comparisons of business level measures of entrepreneurship. Thus, to draw conclusions we use “Business Demography in Europe” (Eurostat, 2004). Unfortunately, this survey does not cover the same countries as ECHP but is to our knowledge the most comprehensive cross-country study containing the countries we are interested in. The study contains enterprise birth and death rates in addition to the survival rate of new enterprises. Using these dynamic business level measures we find almost no difference compared to the entry and exit rates of self-employment. The top countries are still Netherlands, Luxembourg and Denmark while the countries at the bottom are Belgium, Finland and Sweden. It is reassuring that the same conclusions emerge from business level and individual level measures, despite the numerous problems referred to above.

### **3.5 Discussion**

We have argued that an ideal measure contained in a single number is impossible to construct because entrepreneurship is a multifaceted concept. The ideal indicator of

entrepreneurship should capture the risk-taking aspect of the Knightian entrepreneur while at the same time reflecting the innovative approach to entrepreneurship emphasised by Schumpeter.

As noted under the theoretical discussion, Knight's theory is about the *entrepreneur* in contrast to the Schumpeterian theory which is about *entrepreneurship*. Hence, quantification of Knightian entrepreneurship is easier because the unit of account is given by theory. The best indicator of Knightian entrepreneurship is the self-employment rate especially because cross country analysis is straightforward. However, the indicator does not capture owner-managers and is, thus, biased downwards.

When concentrating on Schumpeterian innovative entrepreneurship, a dynamic indicator is required to capture the process of change embedded in his approach. Measuring Schumpeterian entrepreneurship poses a larger problem because theory does not give a clear answer to what the unit of account should be. Ideally, we should construct an indicator which reflects all five entrepreneurial tasks, but we are often forced to settle for less because of lack of data. Business entry and exit rates are used frequently in the literature and with the current data available this is probably as far as we can go.

## **4. Conclusion**

“Entrepreneurship” is frequently advocated in the public debate as the solution to all our trouble. However, often we do not know precisely what is meant with it. In this paper, we have tried to look at the different definitions in the economic literature – both the classic contributions, the formal models and some of the recently applied definitions by the OECD. The lack of consensus is striking. Not even recent OECD publications can agree on a general definition. We concluded that entrepreneurship is best considered a multifaceted concept, involving aspects such as innovation, risk-bearing, and management.

Many different empirical measures of entrepreneurship are used in practice. We have argued that most of these reflect the Knightian definition of entrepreneurship, while some

of the more specialised can capture aspects of Schumpeterian entrepreneurship. However, we have also pointed to a number of limitations of these measures.

The fact that the different empirical measures reflect different aspects of entrepreneurship may in part explain why they provide quite different pictures of the relative entrepreneurial performance of countries. This in turn requires researchers to be precise about which aspect is considered in a given context. At present, most of the empirical measures in use are related to the Knightian definition, while Schumpeter's theory is most frequently cited when arguing for the importance of entrepreneurship in the economy.

## Appendix

**Figure 3: Non-agricultural self-employment share of labour force (EHP).**

	1994	1995	1996	1997	1998	1999	2000	2001
Austria	-	0.078 <i>0.006</i>	0.082 <i>0.007</i>	0.071 <i>0.007</i>	0.068 <i>0.007</i>	0.074 <i>0.007</i>	0.072 <i>0.007</i>	0.075 <i>0.008</i>
Belgium	0.111 <i>0.006</i>	0.118 <i>0.006</i>	0.111 <i>0.006</i>	0.115 <i>0.007</i>	0.110 <i>0.007</i>	0.118 <i>0.008</i>	0.116 <i>0.008</i>	0.104 <i>0.008</i>
Denmark	0.053 <i>0.004</i>	0.056 <i>0.005</i>	0.052 <i>0.005</i>	0.054 <i>0.005</i>	0.056 <i>0.006</i>	0.049 <i>0.006</i>	0.058 <i>0.006</i>	0.051 <i>0.006</i>
Finland	-	-	0.087 <i>0.005</i>	0.089 <i>0.005</i>	0.112 <i>0.005</i>	0.111 <i>0.006</i>	0.098 <i>0.007</i>	0.104 <i>0.008</i>
France	0.069 <i>0.003</i>	0.078 <i>0.003</i>	0.078 <i>0.004</i>	0.074 <i>0.004</i>	0.070 <i>0.004</i>	0.069 <i>0.004</i>	0.070 <i>0.004</i>	0.066 <i>0.004</i>
Germany*	0.064 <i>0.004</i>	0.064 <i>0.004</i>	0.067 <i>0.004</i>	-	-	-	-	-
Germany**	0.074 <i>0.005</i>	0.082 <i>0.006</i>	0.090 <i>0.006</i>	0.090 <i>0.006</i>	0.084 <i>0.006</i>	0.089 <i>0.007</i>	0.078 <i>0.006</i>	0.084 <i>0.007</i>
Greece	0.287 <i>0.008</i>	0.276 <i>0.008</i>	0.270 <i>0.008</i>	0.264 <i>0.008</i>	0.275 <i>0.009</i>	0.262 <i>0.009</i>	0.258 <i>0.009</i>	0.248 <i>0.009</i>
Ireland	0.114 <i>0.006</i>	0.113 <i>0.006</i>	0.114 <i>0.007</i>	0.111 <i>0.007</i>	0.106 <i>0.007</i>	0.107 <i>0.009</i>	0.099 <i>0.009</i>	0.090 <i>0.009</i>
Italy	0.203 <i>0.006</i>	0.219 <i>0.006</i>	0.218 <i>0.006</i>	0.212 <i>0.006</i>	0.208 <i>0.006</i>	0.209 <i>0.006</i>	0.209 <i>0.007</i>	0.209 <i>0.007</i>
Luxembourg*	0.072 <i>0.009</i>	0.073 <i>0.009</i>	0.068 <i>0.009</i>	-	-	-	-	-
Luxembourg**	-	0.085 <i>0.006</i>	0.073 <i>0.006</i>	0.071 <i>0.006</i>	0.067 <i>0.006</i>	0.063 <i>0.006</i>	0.063 <i>0.006</i>	0.061 <i>0.006</i>
Netherlands	0.042 <i>0.003</i>	0.044 <i>0.003</i>	0.049 <i>0.004</i>	0.050 <i>0.004</i>	0.048 <i>0.004</i>	0.053 <i>0.004</i>	0.052 <i>0.004</i>	0.055 <i>0.004</i>
Portugal	0.177 <i>0.008</i>	0.179 <i>0.008</i>	0.184 <i>0.008</i>	0.180 <i>0.009</i>	0.176 <i>0.009</i>	0.167 <i>0.009</i>	0.164 <i>0.009</i>	0.168 <i>0.010</i>
Spain	0.163 <i>0.005</i>	0.160 <i>0.005</i>	0.159 <i>0.006</i>	0.158 <i>0.006</i>	0.160 <i>0.007</i>	0.157 <i>0.007</i>	0.162 <i>0.008</i>	0.138 <i>0.007</i>
Sweden	-	-	-	0.101 <i>0.006</i>	0.099 <i>0.006</i>	0.098 <i>0.006</i>	0.095 <i>0.006</i>	0.099 <i>0.006</i>
UK*	0.136 <i>0.005</i>	0.140 <i>0.006</i>	0.141 <i>0.007</i>	-	-	-	-	-
UK**	0.129 <i>0.006</i>	0.135 <i>0.006</i>	0.136 <i>0.006</i>	0.132 <i>0.006</i>	0.119 <i>0.006</i>	0.118 <i>0.006</i>	0.112 <i>0.006</i>	0.119 <i>0.006</i>

Note: See figure 1. Robust Standard Errors in *italics* (estimated using sampling weights).

\*Original ECHP survey \*\*ECHP based on national survey

**Figure 4: High-skilled self-employment rates**

	1994	1995	1996	1997	1998	1999	2000	2001
Austria	-	0.012	0.008	0.009	0.008	0.009	0.011	0.015
		<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.003</i>	<i>0.003</i>
Belgium	0.047	0.051	0.047	0.051	0.056	0.060	0.062	0.058
	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>	<i>0.005</i>	<i>0.005</i>	<i>0.006</i>	<i>0.006</i>	<i>0.006</i>
Denmark	0.017	0.019	0.017	0.019	0.016	0.013	0.019	0.018
	<i>0.002</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.002</i>	<i>0.003</i>	<i>0.003</i>
Finland	-	-	0.028	0.028	0.028	0.029	0.027	0.028
			<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.004</i>
France	0.020	0.022	0.023	0.022	0.021	0.020	0.021	0.020
	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>
Germany*	0.028	0.028	0.030	-	-	-	-	-
	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>					
Germany**	0.030	0.034	0.036	0.033	0.034	0.035	0.030	0.035
	<i>0.003</i>	<i>0.004</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.004</i>
Greece	0.068	0.072	0.068	0.066	0.066	0.059	0.059	0.052
	<i>0.004</i>	<i>0.005</i>	<i>0.005</i>	<i>0.005</i>	<i>0.006</i>	<i>0.005</i>	<i>0.005</i>	<i>0.005</i>
Ireland	0.025	0.026	0.028	0.026	0.027	0.029	0.020	0.021
	<i>0.003</i>	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>	<i>0.005</i>	<i>0.004</i>	<i>0.004</i>
Italy	0.021	0.021	0.023	0.022	0.026	0.026	0.028	0.029
	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.003</i>	<i>0.003</i>
Luxembourg*	0.036	0.037	0.029	-	-	-	-	-
	<i>0.006</i>	<i>0.007</i>	<i>0.006</i>					
Luxembourg**	-	0.027	0.017	0.020	0.022	0.021	0.021	0.025
		<i>0.004</i>	<i>0.003</i>	<i>0.003</i>	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>
Netherlands	0.013	0.014	0.017	0.016	0.001	0.005	0.003	0.000
	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.000</i>	<i>0.001</i>	<i>0.001</i>	<i>0.000</i>
Portugal	0.013	0.014	0.012	0.015	0.014	0.013	0.014	0.017
	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.004</i>
Spain	0.029	0.030	0.030	0.034	0.036	0.035	0.034	0.035
	<i>0.002</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.004</i>	<i>0.003</i>	<i>0.004</i>	<i>0.004</i>
Sweden	-	-	-	0.028	0.026	0.036	0.033	0.035
				<i>0.003</i>	<i>0.003</i>	<i>0.004</i>	<i>0.003</i>	<i>0.004</i>
UK*	0.036	0.039	0.044	-	-	-	-	-
	<i>0.003</i>	<i>0.003</i>	<i>0.004</i>					
UK**	0.049	0.053	0.053	0.054	0.070	0.070	0.055	0.057
	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>	<i>0.005</i>	<i>0.005</i>	<i>0.004</i>	<i>0.004</i>

Note: See figure 2. Robust Standard Errors in *italics* (estimated using sampling weights).

\*Original ECHP survey \*\*ECHP based on national survey

**Table 3: Self-employment in low- and high-skilled sectors.**

	1994		1995		1996		1997		1998		1999		2000		2001	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Austria	-	-	0.100 <i>0.010</i>	0.055 <i>0.010</i>	0.100 <i>0.010</i>	0.066 <i>0.013</i>	0.085 <i>0.010</i>	0.079 <i>0.015</i>	0.086 <i>0.011</i>	0.079 <i>0.015</i>	0.097 <i>0.012</i>	0.081 <i>0.015</i>	0.081 <i>0.011</i>	0.086 <i>0.018</i>	0.091 <i>0.012</i>	0.094 <i>0.019</i>
Belgium	0.177 <i>0.013</i>	0.133 <i>0.014</i>	0.181 <i>0.014</i>	0.143 <i>0.015</i>	0.173 <i>0.015</i>	0.131 <i>0.015</i>	0.191 <i>0.016</i>	0.100 <i>0.016</i>	0.190 <i>0.017</i>	0.104 <i>0.015</i>	0.131 <i>0.036</i>	0.093 <i>0.039</i>	0.105 <i>0.036</i>	0.018 <i>0.013</i>	0.175 <i>0.019</i>	0.075 <i>0.014</i>
Denmark	0.104 <i>0.010</i>	0.047 <i>0.009</i>	0.105 <i>0.010</i>	0.059 <i>0.012</i>	0.092 <i>0.011</i>	0.041 <i>0.011</i>	0.090 <i>0.012</i>	0.038 <i>0.011</i>	0.100 <i>0.015</i>	0.059 <i>0.015</i>	0.095 <i>0.017</i>	0.059 <i>0.018</i>	0.094 <i>0.016</i>	0.045 <i>0.012</i>	0.077 <i>0.016</i>	0.046 <i>0.011</i>
Finland	-	-	-	-	0.150 <i>0.010</i>	0.099 <i>0.011</i>	0.153 <i>0.010</i>	0.090 <i>0.011</i>	0.095 <i>0.017</i>	0.078 <i>0.020</i>	0.118 <i>0.016</i>	0.098 <i>0.023</i>	0.136 <i>0.017</i>	0.094 <i>0.022</i>	0.144 <i>0.020</i>	0.095 <i>0.021</i>
France	0.109 <i>0.007</i>	0.043 <i>0.006</i>	0.109 <i>0.007</i>	0.044 <i>0.006</i>	0.104 <i>0.007</i>	0.047 <i>0.006</i>	0.115 <i>0.008</i>	0.054 <i>0.007</i>	0.112 <i>0.008</i>	0.045 <i>0.007</i>	0.107 <i>0.008</i>	0.051 <i>0.007</i>	0.105 <i>0.008</i>	0.048 <i>0.007</i>	0.100 <i>0.009</i>	0.043 <i>0.007</i>
Germany*	0.078 <i>0.007</i>	0.075 <i>0.009</i>	0.075 <i>0.007</i>	0.069 <i>0.009</i>	0.080 <i>0.007</i>	0.069 <i>0.009</i>	-	-	-	-	-	-	-	-	-	-
Germany**	-	-	-	-	-	-	-	-	-	-	-	-	0.092 <i>0.010</i>	0.099 <i>0.017</i>	0.102 <i>0.012</i>	0.104 <i>0.019</i>
Greece	0.452 <i>0.012</i>	0.291 <i>0.021</i>	0.431 <i>0.013</i>	0.279 <i>0.022</i>	0.418 <i>0.013</i>	0.258 <i>0.023</i>	0.420 <i>0.014</i>	0.257 <i>0.023</i>	0.411 <i>0.014</i>	0.261 <i>0.026</i>	0.409 <i>0.015</i>	0.202 <i>0.022</i>	0.394 <i>0.015</i>	0.216 <i>0.022</i>	0.375 <i>0.014</i>	0.193 <i>0.021</i>
Ireland	0.187 <i>0.011</i>	0.149 <i>0.017</i>	0.182 <i>0.012</i>	0.140 <i>0.018</i>	0.184 <i>0.014</i>	0.147 <i>0.020</i>	0.181 <i>0.014</i>	0.133 <i>0.020</i>	0.171 <i>0.014</i>	0.121 <i>0.019</i>	0.170 <i>0.017</i>	0.134 <i>0.020</i>	0.148 <i>0.018</i>	0.104 <i>0.021</i>	0.138 <i>0.017</i>	0.094 <i>0.019</i>
Italy	0.341 <i>0.010</i>	0.226 <i>0.015</i>	0.362 <i>0.011</i>	0.254 <i>0.016</i>	0.347 <i>0.011</i>	0.242 <i>0.016</i>	0.349 <i>0.011</i>	0.236 <i>0.015</i>	0.347 <i>0.012</i>	0.231 <i>0.016</i>	0.339 <i>0.012</i>	0.238 <i>0.016</i>	0.338 <i>0.013</i>	0.232 <i>0.017</i>	0.334 <i>0.013</i>	0.263 <i>0.018</i>
Luxembourg*	0.077 <i>0.014</i>	0.077 <i>0.020</i>	0.075 <i>0.014</i>	0.075 <i>0.019</i>	0.084 <i>0.017</i>	0.053 <i>0.014</i>	-	-	-	-	-	-	-	-	-	-
Luxembourg**	-	-	-	-	-	-	-	-	0.101 <i>0.012</i>	0.050 <i>0.011</i>	0.090 <i>0.011</i>	0.060 <i>0.012</i>	0.101 <i>0.013</i>	0.052 <i>0.011</i>	0.091 <i>0.012</i>	0.058 <i>0.011</i>
Portugal	0.274 <i>0.013</i>	0.150 <i>0.020</i>	0.264 <i>0.013</i>	0.156 <i>0.020</i>	0.259 <i>0.013</i>	0.146 <i>0.021</i>	0.269 <i>0.014</i>	0.166 <i>0.023</i>	0.258 <i>0.014</i>	0.173 <i>0.023</i>	0.241 <i>0.014</i>	0.174 <i>0.025</i>	0.248 <i>0.015</i>	0.133 <i>0.020</i>	0.252 <i>0.017</i>	0.124 <i>0.019</i>
Spain	0.287 <i>0.010</i>	0.139 <i>0.013</i>	0.274 <i>0.010</i>	0.160 <i>0.014</i>	0.274 <i>0.011</i>	0.157 <i>0.015</i>	0.271 <i>0.011</i>	0.166 <i>0.016</i>	0.267 <i>0.012</i>	0.164 <i>0.018</i>	0.269 <i>0.013</i>	0.144 <i>0.015</i>	0.270 <i>0.013</i>	0.131 <i>0.015</i>	0.229 <i>0.012</i>	0.124 <i>0.015</i>
Sweden	-	-	-	-	-	-	0.164 <i>0.012</i>	0.158 <i>0.016</i>	0.177 <i>0.012</i>	0.130 <i>0.015</i>	0.160 <i>0.012</i>	0.137 <i>0.014</i>	0.139 <i>0.011</i>	0.136 <i>0.015</i>	0.156 <i>0.012</i>	0.120 <i>0.013</i>
UK*	0.218 <i>0.010</i>	0.111 <i>0.010</i>	0.214 <i>0.011</i>	0.108 <i>0.011</i>	0.220 <i>0.014</i>	0.116 <i>0.014</i>	-	-	-	-	-	-	-	-	-	-
UK**	0.198 <i>0.011</i>	0.119 <i>0.011</i>	0.205 <i>0.012</i>	0.122 <i>0.012</i>	0.200 <i>0.011</i>	0.127 <i>0.012</i>	0.190 <i>0.011</i>	0.124 <i>0.012</i>	0.185 <i>0.011</i>	0.117 <i>0.011</i>	0.180 <i>0.011</i>	0.117 <i>0.012</i>	0.164 <i>0.011</i>	0.115 <i>0.012</i>	0.181 <i>0.012</i>	0.118 <i>0.012</i>

Note: See table 1. Robust Standard Errors in *italics* (estimated using sampling weights).

\*Original ECHP survey \*\*ECHP based on national survey

**Table 4: Self-employment rates in a standard sector classification**

	1994		1995		1996		1997		1998		1999		2000		2001	
	Industry	Service	Industry	Service	Industry	Service	Industry	Service	Industry	Service	Industry	Service	Industry	Service	Industry	Service
Austria	-	-	0.054 <i>0.008</i>	0.121 <i>0.014</i>	0.057 <i>0.009</i>	0.122 <i>0.014</i>	0.054 <i>0.009</i>	0.111 <i>0.014</i>	0.054 <i>0.009</i>	0.115 <i>0.016</i>	0.052 <i>0.009</i>	0.133 <i>0.017</i>	0.046 <i>0.009</i>	0.117 <i>0.016</i>	0.051 <i>0.010</i>	0.129 <i>0.017</i>
Belgium	0.113 <i>0.012</i>	0.208 <i>0.015</i>	0.121 <i>0.013</i>	0.214 <i>0.016</i>	0.108 <i>0.013</i>	0.207 <i>0.017</i>	0.127 <i>0.016</i>	0.188 <i>0.018</i>	0.101 <i>0.014</i>	0.207 <i>0.019</i>	0.134 <i>0.050</i>	0.107 <i>0.031</i>	0.079 <i>0.039</i>	0.061 <i>0.025</i>	0.109 <i>0.019</i>	0.160 <i>0.018</i>
Denmark	0.070 <i>0.010</i>	0.097 <i>0.010</i>	0.071 <i>0.010</i>	0.107 <i>0.012</i>	0.062 <i>0.010</i>	0.088 <i>0.013</i>	0.076 <i>0.013</i>	0.067 <i>0.011</i>	0.091 <i>0.018</i>	0.081 <i>0.014</i>	0.093 <i>0.021</i>	0.074 <i>0.016</i>	0.078 <i>0.016</i>	0.068 <i>0.014</i>	0.057 <i>0.015</i>	0.070 <i>0.014</i>
Finland	-	-	-	-	0.079 <i>0.009</i>	0.181 <i>0.012</i>	0.096 <i>0.010</i>	0.165 <i>0.011</i>	0.061 <i>0.018</i>	0.111 <i>0.019</i>	0.078 <i>0.016</i>	0.140 <i>0.020</i>	0.080 <i>0.015</i>	0.164 <i>0.022</i>	0.092 <i>0.016</i>	0.163 <i>0.024</i>
France	0.065 <i>0.006</i>	0.100 <i>0.007</i>	0.070 <i>0.007</i>	0.096 <i>0.007</i>	0.068 <i>0.007</i>	0.094 <i>0.007</i>	0.079 <i>0.008</i>	0.103 <i>0.008</i>	0.072 <i>0.008</i>	0.098 <i>0.008</i>	0.072 <i>0.008</i>	0.094 <i>0.008</i>	0.073 <i>0.008</i>	0.090 <i>0.008</i>	0.074 <i>0.010</i>	0.081 <i>0.008</i>
Germany*	0.057 <i>0.006</i>	0.109 <i>0.010</i>	0.061 <i>0.007</i>	0.090 <i>0.010</i>	0.062 <i>0.007</i>	0.097 <i>0.010</i>	-	-	-	-	-	-	-	-	-	-
Germany**	-	-	-	-	-	-	-	-	-	-	-	-	0.058 <i>0.010</i>	0.140 <i>0.016</i>	0.063 <i>0.011</i>	0.152 <i>0.018</i>
Greece	0.327 <i>0.015</i>	0.491 <i>0.014</i>	0.314 <i>0.016</i>	0.460 <i>0.015</i>	0.307 <i>0.017</i>	0.435 <i>0.016</i>	0.308 <i>0.017</i>	0.434 <i>0.016</i>	0.342 <i>0.020</i>	0.398 <i>0.017</i>	0.321 <i>0.019</i>	0.383 <i>0.017</i>	0.328 <i>0.020</i>	0.364 <i>0.017</i>	0.307 <i>0.019</i>	0.347 <i>0.016</i>
Ireland	0.155 <i>0.013</i>	0.191 <i>0.013</i>	0.148 <i>0.014</i>	0.184 <i>0.014</i>	0.162 <i>0.016</i>	0.179 <i>0.016</i>	0.157 <i>0.016</i>	0.171 <i>0.016</i>	0.166 <i>0.017</i>	0.145 <i>0.015</i>	0.151 <i>0.018</i>	0.162 <i>0.019</i>	0.144 <i>0.020</i>	0.125 <i>0.019</i>	0.125 <i>0.018</i>	0.122 <i>0.018</i>
Italy	0.233 <i>0.011</i>	0.397 <i>0.013</i>	0.248 <i>0.012</i>	0.426 <i>0.014</i>	0.232 <i>0.011</i>	0.410 <i>0.013</i>	0.228 <i>0.011</i>	0.399 <i>0.013</i>	0.215 <i>0.012</i>	0.409 <i>0.014</i>	0.214 <i>0.012</i>	0.405 <i>0.015</i>	0.222 <i>0.014</i>	0.387 <i>0.015</i>	0.216 <i>0.014</i>	0.396 <i>0.016</i>
Luxembourg*	0.018 <i>0.009</i>	0.115 <i>0.018</i>	0.016 <i>0.010</i>	0.116 <i>0.018</i>	0.018 <i>0.012</i>	0.107 <i>0.017</i>	-	-	-	-	-	-	-	-	-	-
Luxembourg**	-	-	-	-	-	-	-	-	0.049 <i>0.011</i>	0.101 <i>0.011</i>	0.052 <i>0.012</i>	0.092 <i>0.011</i>	0.057 <i>0.013</i>	0.094 <i>0.012</i>	0.052 <i>0.013</i>	0.089 <i>0.011</i>
Netherlands	0.038 <i>0.007</i>	0.076 <i>0.009</i>	0.042 <i>0.008</i>	0.075 <i>0.008</i>	0.043 <i>0.008</i>	0.084 <i>0.009</i>	0.034 <i>0.007</i>	0.083 <i>0.008</i>	0.029 <i>0.006</i>	0.077 <i>0.009</i>	0.035 <i>0.007</i>	0.074 <i>0.007</i>	0.038 <i>0.007</i>	0.073 <i>0.008</i>	0.064 <i>0.011</i>	0.067 <i>0.009</i>
Portugal	0.168 <i>0.013</i>	0.337 <i>0.019</i>	0.171 <i>0.013</i>	0.323 <i>0.018</i>	0.168 <i>0.014</i>	0.317 <i>0.019</i>	0.181 <i>0.014</i>	0.325 <i>0.020</i>	0.194 <i>0.015</i>	0.298 <i>0.020</i>	0.190 <i>0.015</i>	0.270 <i>0.020</i>	0.164 <i>0.015</i>	0.286 <i>0.021</i>	0.167 <i>0.016</i>	0.289 <i>0.023</i>
Spain	0.177 <i>0.011</i>	0.305 <i>0.011</i>	0.165 <i>0.011</i>	0.307 <i>0.012</i>	0.166 <i>0.011</i>	0.304 <i>0.013</i>	0.156 <i>0.011</i>	0.320 <i>0.014</i>	0.142 <i>0.011</i>	0.317 <i>0.015</i>	0.157 <i>0.013</i>	0.292 <i>0.015</i>	0.148 <i>0.013</i>	0.296 <i>0.017</i>	0.130 <i>0.013</i>	0.251 <i>0.015</i>
Sweden	-	-	-	-	-	-	0.099 <i>0.012</i>	0.209 <i>0.014</i>	0.111 <i>0.012</i>	0.202 <i>0.014</i>	0.106 <i>0.012</i>	0.188 <i>0.013</i>	0.076 <i>0.010</i>	0.187 <i>0.013</i>	0.106 <i>0.012</i>	0.170 <i>0.013</i>
UK*	0.175 <i>0.011</i>	0.187 <i>0.010</i>	0.178 <i>0.013</i>	0.177 <i>0.011</i>	0.189 <i>0.016</i>	0.178 <i>0.013</i>	-	-	-	-	-	-	-	-	-	-
UK**	0.175 <i>0.012</i>	0.158 <i>0.010</i>	0.183 <i>0.013</i>	0.160 <i>0.011</i>	0.182 <i>0.013</i>	0.162 <i>0.011</i>	0.161 <i>0.012</i>	0.167 <i>0.011</i>	0.137 <i>0.012</i>	0.171 <i>0.011</i>	0.144 <i>0.013</i>	0.161 <i>0.011</i>	0.139 <i>0.013</i>	0.147 <i>0.011</i>	0.152 <i>0.014</i>	0.157 <i>0.011</i>

Note: See table 1. Robust Standard Errors in *italics* (estimated using sampling weights via the delta method).

\*Original ECHP survey \*\*ECHP based on national survey

**Table 5: Entry and Exit rates (relative to the stock of self-employed) for the period 1994-2001.**

	1994		1995		1996		1997		1998		1999		2000		2001	
	entry	exit	entry	exit	entry	exit	entry	exit	entry	exit	entry	exit	entry	exit	entry	exit
Austria	-	-	0.084	0.094	0.247	0.184	0.148	0.139	0.135	0.153	0.111	0.116	0.114	0.143	0.096	0.079
			<i>0.024</i>	<i>0.023</i>	<i>0.046</i>	<i>0.032</i>	<i>0.036</i>	<i>0.029</i>	<i>0.034</i>	<i>0.033</i>	<i>0.035</i>	<i>0.039</i>	<i>0.035</i>	<i>0.042</i>	<i>0.039</i>	<i>0.026</i>
Belgium	0.072	0.053	0.150	0.048	0.094	0.106	0.132	0.051	0.080	0.067	0.056	0.056	0.105	0.096	0.064	0.094
	<i>0.016</i>	<i>0.013</i>	<i>0.026</i>	<i>0.011</i>	<i>0.019</i>	<i>0.019</i>	<i>0.027</i>	<i>0.015</i>	<i>0.020</i>	<i>0.015</i>	<i>0.016</i>	<i>0.015</i>	<i>0.027</i>	<i>0.024</i>	<i>0.019</i>	<i>0.026</i>
Denmark	0.118	0.082	0.180	0.161	0.146	0.208	0.209	0.139	0.240	0.213	0.145	0.195	0.285	0.115	0.123	0.186
	<i>0.029</i>	<i>0.022</i>	<i>0.038</i>	<i>0.029</i>	<i>0.038</i>	<i>0.041</i>	<i>0.053</i>	<i>0.035</i>	<i>0.057</i>	<i>0.040</i>	<i>0.038</i>	<i>0.049</i>	<i>0.070</i>	<i>0.036</i>	<i>0.037</i>	<i>0.044</i>
Finland	-	-	-	-	0.132	0.074	0.126	0.124	0.109	0.207	0.148	0.125	0.106	0.117	0.132	0.114
					<i>0.027</i>	<i>0.013</i>	<i>0.024</i>	<i>0.017</i>	<i>0.017</i>	<i>0.021</i>	<i>0.025</i>	<i>0.018</i>	<i>0.025</i>	<i>0.021</i>	<i>0.030</i>	<i>0.020</i>
France	0.096	0.169	0.066	0.075	0.095	0.067	0.050	0.056	0.070	0.095	0.063	0.053	0.076	0.053	0.040	0.074
	<i>0.016</i>	<i>0.017</i>	<i>0.012</i>	<i>0.013</i>	<i>0.016</i>	<i>0.012</i>	<i>0.012</i>	<i>0.012</i>	<i>0.015</i>	<i>0.016</i>	<i>0.016</i>	<i>0.012</i>	<i>0.017</i>	<i>0.013</i>	<i>0.012</i>	<i>0.018</i>
Germany*	0.188	0.042	0.197	0.145	0.196	0.090	-	-	-	-	-	-	-	-	-	-
	<i>0.031</i>	<i>0.012</i>	<i>0.033</i>	<i>0.024</i>	<i>0.033</i>	<i>0.019</i>										
Germany**	0.104	0.200	0.276	0.142	0.235	0.142	0.131	0.135	0.115	0.177	0.199	0.164	0.145	0.128	0.185	0.122
	<i>0.020</i>	<i>0.036</i>	<i>0.049</i>	<i>0.022</i>	<i>0.037</i>	<i>0.039</i>	<i>0.021</i>	<i>0.022</i>	<i>0.020</i>	<i>0.034</i>	<i>0.040</i>	<i>0.026</i>	<i>0.027</i>	<i>0.022</i>	<i>0.045</i>	<i>0.027</i>
Greece	0.060	0.036	0.182	0.210	0.117	0.121	0.127	0.143	0.131	0.102	0.077	0.140	0.110	0.120	0.085	0.110
	<i>0.008</i>	<i>0.005</i>	<i>0.015</i>	<i>0.013</i>	<i>0.012</i>	<i>0.011</i>	<i>0.014</i>	<i>0.013</i>	<i>0.017</i>	<i>0.012</i>	<i>0.011</i>	<i>0.014</i>	<i>0.015</i>	<i>0.014</i>	<i>0.012</i>	<i>0.013</i>
Ireland	0.103	0.043	0.141	0.105	0.131	0.113	0.126	0.099	0.087	0.119	0.161	0.141	0.187	0.183	0.122	0.153
	<i>0.020</i>	<i>0.011</i>	<i>0.023</i>	<i>0.018</i>	<i>0.024</i>	<i>0.019</i>	<i>0.026</i>	<i>0.019</i>	<i>0.019</i>	<i>0.027</i>	<i>0.043</i>	<i>0.026</i>	<i>0.046</i>	<i>0.035</i>	<i>0.031</i>	<i>0.040</i>
Italy	0.082	0.117	0.227	0.134	0.150	0.123	0.146	0.137	0.146	0.138	0.135	0.108	0.127	0.114	0.114	0.093
	<i>0.009</i>	<i>0.009</i>	<i>0.017</i>	<i>0.011</i>	<i>0.012</i>	<i>0.010</i>	<i>0.013</i>	<i>0.011</i>	<i>0.014</i>	<i>0.011</i>	<i>0.013</i>	<i>0.011</i>	<i>0.014</i>	<i>0.012</i>	<i>0.013</i>	<i>0.011</i>
Luxembourg*	0.198	0.024	0.113	0.105	0.112	0.165	-	-	-	-	-	-	-	-	-	-
	<i>0.067</i>	<i>0.017</i>	<i>0.049</i>	<i>0.041</i>	<i>0.046</i>	<i>0.053</i>										
Luxembourg**	-	-	0.281	0.064	0.078	0.223	0.199	0.126	0.283	0.046	0.181	0.136	0.232	0.118	0.133	0.036
			<i>0.050</i>	<i>0.019</i>	<i>0.024</i>	<i>0.033</i>	<i>0.046</i>	<i>0.030</i>	<i>0.064</i>	<i>0.021</i>	<i>0.051</i>	<i>0.037</i>	<i>0.062</i>	<i>0.038</i>	<i>0.039</i>	<i>0.018</i>
Netherlands	-	-	0.345	0.209	0.251	0.128	0.218	0.186	0.206	0.219	0.230	0.165	0.213	0.216	0.269	0.208
			<i>0.059</i>	<i>0.035</i>	<i>0.047</i>	<i>0.024</i>	<i>0.041</i>	<i>0.030</i>	<i>0.043</i>	<i>0.035</i>	<i>0.049</i>	<i>0.031</i>	<i>0.046</i>	<i>0.034</i>	<i>0.047</i>	<i>0.046</i>
Portugal	0.040	0.030	0.171	0.175	0.234	0.169	0.181	0.160	0.131	0.143	0.081	0.134	0.109	0.116	0.110	0.088
	<i>0.010</i>	<i>0.008</i>	<i>0.021</i>	<i>0.019</i>	<i>0.028</i>	<i>0.019</i>	<i>0.025</i>	<i>0.019</i>	<i>0.021</i>	<i>0.017</i>	<i>0.014</i>	<i>0.019</i>	<i>0.020</i>	<i>0.019</i>	<i>0.022</i>	<i>0.014</i>
Spain	0.079	0.082	0.234	0.201	0.201	0.187	0.185	0.177	0.156	0.149	0.201	0.213	0.151	0.160	0.141	0.220
	<i>0.010</i>	<i>0.010</i>	<i>0.021</i>	<i>0.015</i>	<i>0.019</i>	<i>0.015</i>	<i>0.021</i>	<i>0.016</i>	<i>0.020</i>	<i>0.015</i>	<i>0.024</i>	<i>0.020</i>	<i>0.019</i>	<i>0.017</i>	<i>0.021</i>	<i>0.023</i>
Sweden	-	-	-	-	-	-	-	-	1.212	0.918	1.309	0.954	1.091	0.907	1.254	0.929
									<i>0.112</i>	<i>0.019</i>	<i>0.121</i>	<i>0.016</i>	<i>0.101</i>	<i>0.020</i>	<i>0.115</i>	<i>0.017</i>
UK*	0.223	0.134	0.191	0.164	0.205	0.183	-	-	-	-	-	-	-	-	-	-
	<i>0.022</i>	<i>0.015</i>	<i>0.022</i>	<i>0.017</i>	<i>0.026</i>	<i>0.021</i>										
UK**	0.144	0.223	0.189	0.143	0.183	0.153	0.162	0.171	0.140	0.198	0.181	0.164	0.174	0.173	0.197	0.178
	<i>0.018</i>	<i>0.019</i>	<i>0.024</i>	<i>0.016</i>	<i>0.022</i>	<i>0.017</i>	<i>0.021</i>	<i>0.018</i>	<i>0.020</i>	<i>0.020</i>	<i>0.025</i>	<i>0.020</i>	<i>0.025</i>	<i>0.020</i>	<i>0.028</i>	<i>0.021</i>

Note: See table 2. Robust Standard Errors in *italics* (estimated using sampling weights via the delta method).

\*Original ECHP survey \*\*ECHP based on national survey

**Figure 5: Pooled entry and exit rates, 1994-2001**

	Raw		High-skilled	
	entry	exit	entry	exit
Austria	0.136 <i>0.014</i>	0.131 <i>0.012</i>	0.022 <i>0.005</i>	0.010 <i>0.003</i>
Belgium	0.095 <i>0.008</i>	0.071 <i>0.006</i>	0.038 <i>0.005</i>	0.027 <i>0.004</i>
Denmark	0.177 <i>0.016</i>	0.161 <i>0.013</i>	0.080 <i>0.010</i>	0.053 <i>0.008</i>
Finland	0.125 <i>0.010</i>	0.133 <i>0.008</i>	0.042 <i>0.006</i>	0.040 <i>0.005</i>
France	0.071 <i>0.005</i>	0.082 <i>0.005</i>	0.019 <i>0.003</i>	0.014 <i>0.002</i>
Germany*	0.194 <i>0.019</i>	0.093 <i>0.011</i>	0.071 <i>0.011</i>	0.030 <i>0.006</i>
Germany**	0.172 <i>0.012</i>	0.153 <i>0.011</i>	0.071 <i>0.007</i>	0.062 <i>0.007</i>
Greece	0.112 <i>0.005</i>	0.123 <i>0.004</i>	0.028 <i>0.002</i>	0.024 <i>0.002</i>
Ireland	0.129 <i>0.010</i>	0.111 <i>0.008</i>	0.028 <i>0.004</i>	0.016 <i>0.003</i>
Italy	0.142 <i>0.005</i>	0.121 <i>0.004</i>	0.020 <i>0.002</i>	0.014 <i>0.001</i>
Luxembourg*	0.138 <i>0.031</i>	0.101 <i>0.024</i>	0.041 <i>0.016</i>	0.052 <i>0.019</i>
Luxembourg**	0.194 <i>0.018</i>	0.114 <i>0.011</i>	0.064 <i>0.009</i>	0.034 <i>0.006</i>
Netherlands	0.245 <i>0.018</i>	0.191 <i>0.013</i>	0.029 <i>0.005</i>	0.022 <i>0.004</i>
Portugal	0.134 <i>0.007</i>	0.128 <i>0.006</i>	0.015 <i>0.002</i>	0.009 <i>0.002</i>
Spain	0.168 <i>0.007</i>	0.170 <i>0.006</i>	0.040 <i>0.003</i>	0.033 <i>0.003</i>
UK*	0.207 <i>0.013</i>	0.158 <i>0.010</i>	0.058 <i>0.007</i>	0.040 <i>0.006</i>
UK**	0.170 <i>0.008</i>	0.176 <i>0.007</i>	0.081 <i>0.005</i>	0.083 <i>0.005</i>

Note: See table 2 + 6. Robust Standard Errors in *italics*.

\*Original ECHP survey \*\*ECHP based on national survey

### **Data**

The preceding analysis is based on survey data from the European Community Household Panel (ECHP) - a comprehensive European panel study that at present contains eight waves covering the period 1994-2001<sup>20</sup>. ECHP is survey data provided by Eurostat, based on interviews of households and interviews of the adults that belong to those households. The core set of questions in the ECHP study regards: Population and demography, employment and unemployment issues, income measures, training and education, social benefits etc.

There are two desirable main features about the data set: i) It is possible to do a direct comparison across countries, as the same questionnaire is used in all countries and ii) We are able to track individuals over time, i.e. the data set is not a repeated cross section, but has a true panel structure. With these two main features in hand, it is possible to identify transitions between different labor market states and compare the analysis of self-employment and turnover rates across countries. Finally, the data set includes a set of retrospective variables. This feature enables us to construct turnover rates for individuals who were not in the sample in the previous wave and adds one more year for a whole cross section - the year prior to the survey.

The data is selected to focus attention on individuals in the labor force. That is, we exclude economically inactive individuals, such as students, retired persons, and individuals doing housework or looking after children or other persons, individuals in community or military service and unpaid family workers. Since start and retirement patterns are very dependent on age, we focus on individuals aged 25 to 60 to avoid too many distortions of the results from this effect.

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<sup>20</sup>The results and conclusion stated in this paper are ours and the Eurostat is not responsible for those.

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