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Determinants of entrepreneurial engagement levels in Europe and the US

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In this article, the process of the entrepreneurial decision is decomposed in seven engagement levels ranging from "never thought about starting a business" to "gave up," "thinking about it," "taking steps for starting up," "having a young business," "having an older business," and "no longer being an entrepreneur." By using a multinomial logit model, we allow the effect of covariates to differ across the various entrepreneurial engagement levels. Data from two *Entrepreneurship Flash Eurobarometer* surveys (2002 and 2003) containing over 20,000 observations of the 15 old EU Member States, Norway, Iceland, Liechtenstein, and the United States are used. Other than demographic variables, the set of explanatory variables used includes the perception by respondents of administrative complexities, of availability of financial support, and of risk tolerance, the respondents' preference for self-employment and country-specific effects. Among our results, we find that the perception of lack of financial support has no discriminative effect across the various levels of entrepreneurial engagement while perception of administrative complexities plays a negative role only for high levels of engagement.

1. Introduction

Moderate economic growth, together with persistently high levels of unemployment, stimulate expectations of entrepreneurship's potential as a source of economic growth and job creation (Acs, 1992; Carree and Thurik, 2003, 2006; Beck *et al.*, 2005). Hence, entrepreneurship emerged as a key agenda item for economic policy makers across Europe, with individual nations and the European Union actively promoting it (OECD, 1998; European Commission, 1999, 2004). Obviously, the determinants of entrepreneurship and the role various policy options play are receiving generous attention in academic and policy circles (Audretsch *et al.*, 2002). Too often, however, the determinants of entrepreneurship are investigated in the context of a binary choice model. This neglects the fact that the road to become an entrepreneur as well as the road as an entrepreneur is long, and that the choices to pursue this career depend upon the level of entrepreneurial engagement.

In other words, setting up a business is the result of a long series of complex choices. It is a process rather than the result of a single binary choice and the determinants of entrepreneurship are not necessarily equal across different engagement levels of this process. Policy makers can overlook important insights if they create policy instruments aiming at influencing a binary choice. Rather, they are confronted with a moving target while—as we will show in the present article—the characteristics of the target change with the level of engagement.

That setting up a business is a process has been recognized by some authors (Low and MacMillan, 1988; Bull and Willard, 1993) and a distinction between stages such as conception, gestation, infancy, adolescence, maturity, and decline has been established (Reynolds, 1997; Reynolds and White, 1997). Often, conception, gestation, and infancy stages are referred to as the *dynamics* of entrepreneurship while the adolescence, maturity, and decline stages are identified as the *level* of entrepreneurship (Sternberg and Wennekers, 2005). The term nascent entrepreneurship applies to the combination of gestation and infancy (Reynolds *et al.*, 2005).[1] Elsewhere, a distinction is made between opportunity recognition and opportunity exploitation stages (Sarasvathy *et al.*, 2003). Distinguishing between the stages continues even after a business is established (Gartner and Carter, 2003).

Determinants are not necessarily the same across the stages of the entrepreneurial process (Davidsson, 2006; Reynolds, 2007). In the present study, we distinguish between seven stages of entrepreneurship referred to as engagement levels. The stages include two nascent ones ("thinking about it" and "taking steps for starting up"), two business ones ("having a young business" and "having an older business"), two exit ones ("gave up" and "no longer being an entrepreneur"), and an outsider one ("never thought about it"). Although these stages of the entrepreneurial process do not necessarily correspond with an increasing degree of involvement we will refer to them as engagement levels.

We address the issue of the determinants of the various engagement levels using a multinomial logit model which estimates the influence of a set of explanatory variables on these entrepreneurial engagement levels using survey data (*Entrepreneurship Flash Eurobarometer* surveys for 2002 and 2003) of nearly 20,000 respondents in 19 countries (15 old EU Member States plus Norway, Iceland, Liechtenstein, and the United States).[2] Other than demographic variables such as gender, age, and education level, the set of explanatory variables includes the

[1]Since the work of the *Global Entrepreneurship Monitor* (GEM) the term nascent entrepreneurship has become widely accepted (Reynolds *et al.*, 1999). GEM uses nascent entrepreneurship in a relatively narrow sense (Reynolds *et al.*, 2005).

[2]The *Entrepreneurship Flash Eurobarometer* surveys are conducted on behalf of the European Commission, and the key findings are presented in the *Eurobarometer* surveys of European Commission (*Flash Eurobarometer 134* and *146* for 2002 and 2003, respectively). See http://europa.eu.int/comm/enterprise/enterprise_policy/survey/eurobarometer_intro.htm.

perception[3] by respondents of administrative complexities, of availability of financial support, a rough measure of risk tolerance, and the respondents' preference to be self-employed.[4]

Country heterogeneity is controlled for using country dummy variables. Despite the lack of consensus with respect to different aspects of entrepreneurship, scholars appear to agree that the *level* of entrepreneurial activity varies systematically across countries (Rees and Shah, 1986; de Wit and van Winden, 1989; Blanchflower and Meyer, 1994; Blanchflower, 2000, 2004).[5] Also the *dynamics* of entrepreneurship, expressed as the rate of nascent entrepreneurship or the prevalence of young enterprises, show a wide-ranging diversity across nations.[6] In the present study, country dummies are used as controls to establish the influence of individual determinants and they are concisely discussed.[7]

The contribution of the present article is twofold. First, to our knowledge, it is the first to discriminate between more than two engagement levels of entrepreneurship. Standard binary choice models discriminate between nascent entrepreneurship and no engagement or entrepreneurship and no engagement (Blanchflower and Oswald, 1998; Blanchflower *et al.*, 2001; Grilo and Thurik, 2005a, 2006; Grilo and Irigoyen, 2006) or success and failure (i.e. survival) in the nascent phase (Vivarelli, 2004; van Gelderen *et al.*, 2005). The present study discriminates between seven entrepreneurial engagement levels. The multinomial choice model predicts the probability that an individual chooses one of the engagement levels. Similar setups can be found in Earle and Sakova (2000) where two types of self-employment and wage

[3]The important role of perception variables is shown in Arenius and Minniti (2005), Koellinger and Minniti (2006) and Koellinger *et al.* (2007).

[4]The preference for entrepreneurship over paid employment is sometimes referred to as latent entrepreneurship (Blanchflower *et al.*, 2001; Grilo and Irigoyen, 2006).

[5]See, Van Stel (2005) for a description of the COMPENDIA data set covering business ownership rates across 23 OECD countries in the 1972–2002 period. Thurik *et al.* (2008) use this data set to explain the dynamic relationship between these rates and unemployment rates taking into account systematic country differences.

[6]Research in the framework of the GEM shows that there are substantial differences in the *dynamics* of entrepreneurship across countries with the developed Asian and Central European countries ranking lowest, followed by Europe. Substantially higher levels are found in the former British Empire Anglo countries (including the United States) and still higher ranked are the Latin American and developing Asian countries (Reynolds *et al.*, 2002; Acs *et al.*, 2005). See also Wennekers *et al.* (2005). Differences in the role of entrepreneurship over time, i.e., over levels of economic development, are emphasized in Audretsch and Thurik (2000, 2001, 2004).

[7]This country heterogeneity is often related to diverging demographic, cultural, and institutional characteristics (Blanchflower, 2000; Verheul *et al.*, 2002; Freytag and Thurik, 2007). In a recent series of studies, some cultural drivers of entrepreneurship have been investigated: postmaterialism in Uhlaner and Thurik (2007), dissatisfaction in Noorderhaven *et al.* (2004), and uncertainty avoidance in Wennekers *et al.* (2007).

employment are predicted and Cooper *et al.* (1994) where entrepreneurial failure, survival, and growth are predicted. This approach allows capturing eventual non-monotonicity of effects or variation in their intensities which a binary model cannot illustrate. For example, results on the role of administrative complexities suggest that it is principally at the high levels of entrepreneurial engagement that these are seen as an obstacle, not at the earlier more "contemplative" levels. Second, we incorporate a multi-level effect using country dummies as covariates. In this fashion, we can control for country effects when using individual socio-demographic and perception influences.[8]

The article is organized as follows: Section 2 deals with the literature on the determinants of entrepreneurship and is organized in three parts consisting of a brief introduction followed by insights from the literature and then our setup. Section 3 describes the data while our empirical analysis of the determinants of engagement levels is covered in Section 4. Section 5 provides conclusions.

2. Determinants of entrepreneurship

2.1 Introduction

Entrepreneurship is a multidimensional phenomenon spanning different units of observation ranging from the individual to the firm, region or industry, and even nation (Wennekers and Thurik, 1999; Davidsson, 2004). Due to this multidimensional nature, the conceptual and theoretical approaches have built on a variety of disciplines such as economics, sociology, and psychology (Wennekers *et al.*, 2002). In the 20th century, three scholars, Schumpeter, Kirzner, and Knight, stand out in having shaped the subsequent literature on entrepreneurship through their vision of the phenomenon.[9]

Breaking with the orthodox approach which tended to analyze market functioning and agents' decisions as an equilibrium phenomenon, the Schumpeterian tradition stresses the inherent disequilibrium nature of market dynamics. In this school of thought, entrepreneurship is almost impossible to disassociate from innovative performance. It is the driving force behind firm creation and market dynamics and is indeed seen as the consequence of entrepreneurial innovation. The entrepreneur is the "persona causa" of pushing the economy out of equilibrium.

In the Kirznerian world, entrepreneurs display manifest alertness to exploit previously uncharted (profit) opportunities. They are involved in a process of

[8]This multilevel approach is also applied in Blanchflower *et al.*, (2001) with some socio-demographic variables and in Grilo and Irigoyen (2006) where perception variables are used.

[9]Hébert and Link (1989) show that these three intellectual traditions can be traced to Cantillon's Essai sur la Nature du Commerce en Général (translated by H. Higgs, 1931, London: McMillan). Casson (1982) and Wennekers and Thurik (1999) attempt to make a synthesis again. See also van Praag (1999).

learning and discovery with the result that the economy is pushed back towards equilibrium. Kirznerian entrepreneurs operate in a different, i.e., later, phase of the product lifecycle than do Schumpeterian ones whose prime role is to create disequilibrating newness.

Knight's views have also strongly contributed to the subsequent literature on entrepreneurship by stressing the importance of two functions of entrepreneurs: (i) providers of entrepreneurial inputs who receive a return for (ii) bearing (noncalculable) risk.

2.2 Insights from the literature

At the individual level and from an economic theory perspective, the tools of neoclassical microeconomics have provided a framework for studying self-employment decisions known as the theory of income choice. This field has proved useful in describing some of the factors influencing this occupational decision.

This approach views agents as (expected)-utility maximisers taking an occupational choice decision—to become employees or entrepreneurs (self-employed)—on the grounds of the utility associated with the returns accruing from the two types of activity. Though the specification and the working assumptions used in this strand of literature vary according to the factor being emphasized as playing the key role in explaining self-employment decisions, most of this constrained optimization approach can be traced back to the vision of the role of an entrepreneur found in the work of Knight (1971).

Knight views the entrepreneur as playing two functions: "(a) exercising responsible control and (b) securing the owners of productive services against uncertainty and fluctuations in their incomes" (Knight, 1971: 278), in other words, as provider of entrepreneurial inputs and as risk bearer. The first "provider" function plays a role answering the question why different individuals make different occupational choices by emphasizing the role of entrepreneurial ability in the decision to become an entrepreneur. Several authors follow this route by postulating differences across potential entrepreneurs (or firms) in terms of some form of entrepreneurial efficiency or skills (Lucas, 1978; Jovanovic, 1982, 1994; Holmes and Schmitz, 1990; Murphy *et al.*, 1991; Lazear, 2004, 2005).

The second "risk bearer" function gives a particular role to the presence of risk and underlines the importance of risk attitudes in the occupational choice. In Kihlstrom and Laffont (1979) and Parker (1996, 1997), the degree of risk aversion and the differences in risk of the two occupational alternatives determine the occupational choice.

Another aspect that has been emphasized in explaining different occupational choices is the existence of liquidity constraints. Evans and Jovanovic (1989) building upon Lucas (1978) and Jovanovic (1982) show that under certain conditions, due to capital constraints, there is a positive relationship between the probability of

becoming self-employed and the assets of the entrepreneur.[10] This influential study led to many follow up investigations of both conceptual[11] and empirical nature.[12]

Some empirical literature has built on the insights from the occupational choice models and has sought to test the role of factors influencing self-employment decisions. These studies attempt to explain the probability of being or becoming self-employed (Parker, 2004). The earnings differential between self-employment and salaried employment plays a key role in these occupational choice models (Rees and Shah, 1986; de Wit and van Winden, 1989). Moreover, a variety of variables is used to describe the factors influencing returns to self-employment and to salaried employment, their relative risk, and the preferences and abilities of the individuals. Most studies in this area use longitudinal data for a given country, and have as dependent variable the transition into self-employment and sometimes the business longevity and the exit from self-employment. Typical explanatory variables include age, gender, race, education, earnings, capital assets, previous professional experience, marital status, professional status of the parents, and scores from psychological tests.[13]

In the following, we provide a brief summary of results from studies using other data sets and methodological approaches than the ones of the present study. We will focus on variables that can be discussed in the context of our data set. In Section 4,

[10]Next to the "provider" and "risk-bearing" role of the entrepreneur, Knight also refers to wealth as a condition for entrepreneurial action. The research started by Evans and Jovanovic (1989) can be seen as an exploration of this third condition.

[11]Xu (1998) discusses a possible downward bias in wealth data. Cressy (1999) and Harada and Kijima (2005) challenge the necessity of the liquidity constraint condition. Cressy (2000) introduces business uncertainty and decreasing risk aversion.

[12]The empirical establishment of whether wealthier individuals have a higher probability of becoming entrepreneur is widely investigated. See, Evans and Leighton (1989), Holtz-Eakin *et al.* (1994), and Taylor (2001). Hurst and Lusardi (2004) show that the relationship between household wealth and the propensity to start a business is highly nonlinear: using American income data they show that a positive relation can be found only for households in the top 5% of the wealth distribution. An interesting extension of the literature can be found in Burke *et al.* (2000) which uses a new model and a large single cohort British data set to provide estimates of both the self-employment decision as well as income and job creation. Their model distinguishes between the impact of liquidity constraints on the probability to start a firm and subsequent performance. Their setup leads to conclusions such as that university education leads to a lower propensity to start a firm but improves both performance measures. Blanchflower and Oswald (1998) investigate the windfall aspect (inheritances and gifts) of assets and conclude that those receiving assets of that nature are more likely to run their own business.

[13]Examples of empirical work following this approach can be found in Rees and Shah (1986), Blau (1987), Evans and Leighton (1989, 1990), de Wit and van Winden (1989), Bates (1990), Blanchflower and Meyer (1994), Reynolds (1997), Blanchflower and Oswald (1998), Lin *et al.* (2000), Douglas and Shepherd (2002), Wagner (2003), Blanchflower (2004), Grilo and Irigoyen (2006), and Grilo and Thurik (2006).

we will briefly contrast our findings with those reported here. Linking the literature to our findings has to be done with care since—as we previously discussed—these other studies predominantly use standard binary choice models, distinguishing only between (nascent) entrepreneurship and no engagement while we discriminate between seven different engagement levels. Nevertheless, the literature gives many interesting points of reference and contrasting it to our results provides an opportunity to show the value added of our approach. In the below brief summary, we will systematically discriminate between the choice to become entrepreneur and to "become" nascent since this is the closest to approximating our current set up.[14]

- Most studies find that men have a higher probability of engaging in entrepreneurship than women.[15] The same goes for nascent entrepreneurship. An excellent survey was conducted by Davidsson (2006: 36–38).
- The likelihood of becoming self-employed varies with age. Many business owners are within the age category of 25- to 45-years old.[16] Nascent entrepreneurship rates are highest in the age category of 25- to 34-years old, although some studies suggest that people are increasingly starting businesses at a younger age.[17]
- The level of education is a variable for which contrasting results have been obtained.[18] The results vary regarding the existence of a significant impact and the nature of this impact. Among the studies finding that education has a significant impact, the nature of the impact varies from study to study—some find a positive relation, others a negative one, and still others a negative up to some level of

[14]Other approaches can be found in the literature. For instance, the propensity to become entrepreneur given that one already reached the nascent phase or the propensity to exit. These literatures also connect to several of our engagement levels. They are sometimes referred to as "success in the pre-startup phase" (van Gelderen *et al.*, 2005), firm creation (Reynolds, 2007), or "entrepreneurial exit/firm survival" (Stam *et al.*, 2007). Reference to this literature is beyond the scope of the current brief survey.

[15]According to Reynolds *et al.* (2002), men are about twice as likely involved in entrepreneurial activity than women. See also Minniti *et al.* (2005). Much work has been done explaining the gender effect with respect to occupational choice. See, Minniti *et al.* (2005); Grilo and Irigoyen (2006), and Minniti and Nardone (2007). See also Verheul *et al.* (2008) for some evidence showing that gender differentials in actual entrepreneurship are due to other factors than the preference for entrepreneurship. In other words: given the declared preference for entrepreneurship and controlled for many other factors such age, education, etc., women have the same likelihood of becoming self-employed as men.

[16]See, Storey (1994), Reynolds, Hay and Camp (1999), and Grilo and Thurik (2005a).

[17]See, Delmar and Davidsson (2000) and Davidsson (2006).

[18]A survey of empirical studies of the impact of schooling on the entrepreneurial decision is given in van der Sluis *et al.* (2005). The main conclusion is that the impact of education is insignificant. It is also concluded that most studies suffer from a lack of technical sophistication necessary to capture its effect adequately.

education and positive thereafter.[19] The results of Delmar and Davidsson (2000) and Davidsson and Honig (2003) show a clear and positive education effect for nascent entrepreneurs.[20]

- Financial constraints, often evaluated through the role of capital assets on the probability of being self-employed,[21] are generally found to have a negative impact on the decision to become an entrepreneur. Davidsson concludes that "indicators of income and household net worth are not or only weakly related to the propensity to become nascent entrepreneur." (Davidsson, 2006: 8).
- The risk bearer function is already mentioned in Knight (1971). It plays an important role in occupational choice-based models. Parker (2004) discriminates between three families of occupational choice models[22] while also contributing to the analysis of income risk (1996 and 1997). Risk tolerance—as could be expected—is found to increase the probability of being self-employed.[23] Davidsson (2006) refers to the "fear of failure" variable which influences the propensity to become nascent in the obvious fashion.
- The role of perception variables in general is highlighted in van Praag and van Ophem (1995) for the entrepreneurship decision and in Arenius and Minniti (2005), Koellinger and Minniti (2006), Koellinger *et al.* (2007) and Carter *et al.* (2003) with respect to the propensity to become nascent. Our two perception variables (of administrative complexities and of financial constraints) are—to the best of our knowledge—unique to this data set. Grilo and Irigoyen (2006) and Grilo and Thurik (2005a, 2006) have studied their role in the context of explaining (latent) entrepreneurship. The results indicate that perceived administrative complexities have a negative impact while perceived financial constraints do not seem to play a role.

[19]Both Robinson and Sexton (1994) and Cooper and Dunkelberg (1987) show that the self-employment decision is influenced by educational attainment. However, a study at the macro level by Uhlaner and Thurik (2007) shows that a higher level of education in a country is accompanied by a lower rate of nascent and young entrepreneurship. See also de Wit and van Winden (1989). Blanchflower (2004) reports that education is positively correlated with self-employment in the United States but negatively in Europe. Using Eurobarometer data, Grilo and Irigoyen (2006) report a U-shaped relationship for 2000 while Grilo and Thurik (2005a) show that this relation is negative up to the intermediate education level and nonexistent for higher levels.

[20]See, Davidsson (2006) for results of the education effect on the nascency propensity in GEM type studies.

[21]The argument behind the use and interpretation of capital assets to proxy financial constraints is the so-called equivalence theorem in Evans and Jovanovic (1989). See, Cressy (1999) for a discussion of the limitations of this theorem.

[22]Parker (2004) discriminates between the Lucas (1978), the Holmes and Schmitz (1990), and the Kihlstrom Laffont (1979) families.

[23]See, Grilo and Thurik (2005a) and Grilo and Irigoyen (2006) using models to explain to explain the incidence and preference for self-employment.

- There seem to be persistent country differences between levels of entrepreneurship and the propensity to become nascent.[24] Even when corrected for individual differences, these country differences remain.[25] In cross country comparisons, the few studies addressing this issue indicate that entrepreneurship is stronger in the United States than in European countries.[26]

There are many other determinants of being or becoming self-employed which are dealt with in the literature but not in the present study such as employment status (wage, part-time, unemployment, characteristics of the workplace), financial situation (including more than just the constraints mentioned above, such as, household income, assets, home ownership, wealth, windfall effects, number of persons in the household), experience (current work, professional background, former entrepreneurship experience), minority behavior, immigrant behavior, family firm effects, and attitudinal effects (past failures, relatives with experience, confidence, knowing other entrepreneurs, opportunity perception), to name just a few. Blanchflower (2004), Parker (2004), Arenius and Minniti (2005), Wagner (2006), and Davidsson (2006) offer extensive surveys.

2.3 Our setup

These economic approaches, although having the advantages inherent to any rigorous modeling of a situation, fail to encompass all the possible relevant factors influencing individual decisions. In this respect, contributions from noneconomic fields such as sociology and psychology have highlighted the importance of noneconomic determinants like the society's attitude towards entrepreneurs and whether or not failed entrepreneurs are ostracized. Other important entrepreneurial determinants affecting behavior, such as the strength of interpersonal links and psychological characteristics of individuals that make them more prone to take risks and seek success (the so-called internal locus of control) come from fields outside economics.

Verheul *et al.* (2002) present an *Eclectic Framework* of the determinants of entrepreneurship bringing together elements from different fields and levels of analysis, some of which have already been previously discussed.[27] Their framework

[24]See, Freytag and Thurik (2007) for entrepreneurship levels and Acs *et al.* (2005) for the propensity to become entrepreneur.

[25]Grilo and Irigoyen (2006).

[26]Acs *et al.* (2005) and Grilo and Thurik (2005a). There are many other stylized facts in the domain of cross country comparisons. For instance, in Grilo and Thurik (2006), it is shown that the eight new former communist EU Member States do not significantly differ in their entrepreneurial behavior when compared to the seventeen remaining ones.

[27]Updates of the Eclectic Framework are in Wennekers *et al.* (2002) and Audretsch *et al.* (2007). Alternative frameworks are provided by Busenitz *et al.* (2000), Stevenson and Lundström (2001), and by the GEM (Reynolds *et al.*, 1999; Reynolds *et al.*, 2002, and Acs *et al.*, 2005).

distinguishes between two levels: a macro perspective and the individual occupational choice module. The macro perspective classifies the explanatory factors into three categories—supply and demand side and the confrontation between actual and "natural" rates of entrepreneurship.[28] On the demand side, the framework focuses on factors that influence the industrial structure and the diversity of consumers' tastes, such as technological development, globalization, and standard of living developments. The supply side looks into the structure of the population and the way this affects the likelihood of becoming entrepreneur. Population growth, urbanization rate, age structure, participation of women in the labor market, income levels, and unemployment are example of such factors. Next to the macro perspective, the framework also integrates the decision-making process explaining how and why individuals make the choice to become self-employed as opposed to other job opportunities in terms of risks and rewards of different occupational alternatives.[29]

In this framework, other than personal characteristics, the overall environment in which business is conducted plays a crucial role in fostering or weakening entrepreneurial activities both in terms of firm creation, of firm expansion and of implementation of process, product and management innovation within a firm. Our current setup controls for this macro perspective using country dummies while concentrating on personal socio-demographic, perception and preference variables.

3. Observations and variables

Data are from two *Entrepreneurship Flash Eurobarometer* surveys conducted in the fall of 2002 and 2003 covering the 15 older European Union Member States plus Norway, Iceland, Liechtenstein, and the United States. Combined, these surveys contain over 20,000 observations of which 17,631 can be used for our estimation.[30] The interviews have been conducted by telephone between the November 11, 2002 and the November 23, 2002 for 2002 and between the September 10, 2003 and the September 22, 2003 for 2003 by 19 EOS GALLUP EUROPE Institutes.[31] Each national sample is representative of the continental population aged 15 years and more. Similar surveys were conducted in 2000 and 2001. Each year a new random

[28]See, Carree *et al.* (2002 and 2007) and Audretsch *et al.* (2002).

[29]The risk reward profile of entrepreneurs is driven by opportunities on the one hand and their willingness (Praag and Ophem, 1995) on the other. Resources, abilities/traits, and preferences are the components of the willingness to start a business or to remain in business.

[30]See, http://europa.eu.int/comm/enterprise/enterprise_policy/survey/eurobarometer_intro.htm for data and collection method.

[31]See, http://ec.europa.eu/enterprise/enterprise_policy/survey/eurobarometer134_en.pdf and http://ec.europa.eu/enterprise/enterprise_policy/survey/eurobarometer146_en.pdf for more information on these Institutes and on the number of interviews actually conducted in each State.

sample is drawn providing a collection of cross-country data rather than a panel data set.

For the dependent variable, we used the results from the question, "*Have you started a business recently or are you taking steps to start one?*" Respondents were given seven options to chose from:

- "*It never came to your mind*"
- "*No, you thought of it or had already taken steps to start a business but gave up*"
- "*No, but you are thinking about it*"
- "*Yes, you are currently taking steps to start a new business*"
- "*Yes, you have started or taken over a business in the last 3 years and still active*"
- "*Yes, you started or took over a business more than 3 years ago and still active*"
- "*No, you once started a business, but currently you are no longer an entrepreneur*"

Each answer reflects a different, and increasing level of involvement in entrepreneurship with the possible exceptions of the second and last levels which are of a "drop out" nature. The last four options translate into an active role in the entrepreneurial world, while the first three have a softer more "contemplative" nature with varying degrees of interest in the entrepreneurial activities. Respondents choosing "No longer," the last option listed above have many possible pasts: entrepreneurs who retired or sold their firms could be called successful entrepreneurs, while others may have failed or met with less success. The country averages per engagement level, are given in Table 1. There are clear differences between European countries and the United States. In the United States, only 3% gave up, while in every European country, this proportion is significantly above 3%. The "thinking," "taking steps," and "young business" categories in Europe are considerably lower than in the United States, with no single European country ranking as high as the United States, while the level "older business" is on average more present in Europe than in the United States, with the solitary exception of Belgium who has the same 5% as the United States. Those who once had a business but are no longer active are also more represented in Europe than in the United States; with the exception of Ireland and Austria who are on par with the United States.

The explanatory variables used here can be divided into three types.

Socio-demographic variables: gender, age, and level of education. "Age when finished full education" is used to construct three education levels: the first encompasses all those with no education or having left school before the age of 15; the second those who left school between the age of 15 and 21; and the third those having left school past the age of 21.[32] A dummy variable is used for the lower level and another for the higher level so that the intermediary level works as the base.

[32]We not to treat this as a continuous variable due to the discontinuity associated with the group "never having attended full time school."

Table 1 Percentages per engagement level per country

	Never considered	Gave up	Thinking	Taking steps	Business <3 years	Business >3 years	No longer	Observations
Belgium	68	9	8	2	2	5	6	853
Denmark	44	13	18	3	3	9	10	819
Germany	50	13	16	3	4	7	7	1297
Greece	46	11	17	2	4	8	12	875
Spain	60	8	15	2	2	6	7	1129
France	61	14	11	1	1	4	7	1337
Ireland	52	7	21	5	4	7	5	856
Italy	62	7	9	3	2	7	10	1362
Luxembourg	60	16	8	2	2	6	6	814
Netherlands	56	11	10	1	3	9	9	847
Austria	54	8	20	2	4	7	5	808
Portugal	61	9	11	3	3	6	7	815
Finland	54	12	11	2	3	10	9	839
Sweden	66	5	9	3	4	7	6	712
The United Kingdom	53	8	15	2	5	7	10	1149
Iceland	44	5	12	3	6	18	13	536
Norway	50	12	7	2	5	12	11	733
Liechtenstein	48	13	12	4	5	12	5	790
Unweighted European average	55	10	13	3	3	8	8	921
The United States	49	3	23	8	7	5	5	1050

Source: *Flash Eurobarometer Surveys* 134 and 146 (conducted in 2002 and 2003).

Perception and preference variables: these include perception of lack of financial support, perception of administrative complexities, preference for self-employment, and risk tolerance.

The perception of lack of available financial support, the perception of complexity of administrative procedures, and risk tolerance are captured, respectively, by the following questions: "*Do you strongly agree, agree, disagree or strongly disagree with the following statements?*" The statements are:

- "*It is difficult to start one's own business due to a lack of available financial support*"
- "*It is difficult to start one's own business due to the complex administrative procedures*"
- "*One should not start a business if there is a risk it might fail*"

For each statement, a dummy variable was constructed. The dummy variables take the value "1" in the case of "strongly agree" or "agree" for the first two statements.

These first two variables capture, at best, the perception individuals have of the existence of financial or administrative barriers not their actual existence. Most likely these perceptions are the closer to reality the higher the involvement of the respondent in active entrepreneurial activities.

For the third statement, the risk tolerance dummy takes value "1" if "disagree" or "strongly disagree." Clearly, this is a very rough indicator of risk attitudes and calling this dummy "risk tolerance" may be inaccurate; nevertheless, in the absence of a better measure we believe it gives some useful information on how the respondent perceives taking risks. Note that the question asks about a hypothetical general situation (*One should not*...) rather than how the respondent would personally behave. In this sense, it is more a proxy of attitude towards risk than a reflection of the individual's risk aversion Y toward owning and running a business.

Preference for self-employment is constructed on the basis of a direct question asking respondents whether they would prefer to be employed or self-employed. The precise question being "*Suppose you could choose between different kinds of jobs, which one would you prefer: being an employee or being self-employed?*" Given this phrasing, the question places the respondent in a hypothetical situation away from their actual constrains and opportunities, thusly translating his inner preferences rather than his actual likelihood of choosing one over the other.

Country dummies: country-specific effects are evaluated using country dummy variables with the United States as the base. Therefore, the coefficients associated with these variables are to be interpreted as the impact of being in the corresponding country rather than being in the United States.

4. Estimation results

This section estimates a multinomial logit model where the dependent variable is a categorical variable describing different "levels" of engagement in the entrepreneurial process. The factors presented in Table 2 describe the effect of the corresponding variable on the odds (ratio of two probabilities) of the level in question relative to the base level, in our case the base is "It never came to your mind." A factor above unity implies that the corresponding explanatory variable increases the odds of belonging to the level in question relative to the group "It never came to your mind." Conversely, a factor below unity implies that the variable decreases the odds.

Before summarizing the results of Table 2, some measures of explanatory power and diagnostics will be provided.

4.1 Statistics of explanatory power and some diagnostics

The usual explanatory statistics are reported in Table 3. The middle column reports the statistics belonging to the analysis of Table 2. In the right hand column, the same

Table 2 Odds relative to "never having considered starting a business": effect of one unit change in independent variables

	Gave up		Thinking		Taking steps		Business <3 years		Business >3 years		No longer	
	Odds	*P*-value	Odds	*P*-value	Odds	*P*-value	Odds	*P*-value	Odds	*P*-value	Odds	*P*-value
Men	1.506	0.000	1.538	0.000	2.124	0.000	1.934	0.000	2.515	0.000	1.693	0.000
Age	0.998	0.128	0.959	0.000	0.959	0.000	0.986	0.000	1.017	0.000	1.040	0.000
Low education	0.823	0.042	0.795	0.032	0.830	0.397	0.580	0.005	0.666	0.000	0.969	0.725
High education	1.332	0.000	1.484	0.000	2.265	0.000	1.605	0.000	1.422	0.000	1.001	0.992
Preferences	2.412	0.000	4.747	0.000	9.363	0.000	8.363	0.000	9.261	0.000	2.650	0.000
Lack finance	1.028	0.686	0.958	0.487	0.833	0.115	0.870	0.170	0.874	0.073	0.936	0.379
Complexities	1.002	0.971	0.891	0.048	0.841	0.110	0.700	0.000	0.736	0.000	0.786	0.001
Risk tolerance	1.195	0.001	1.319	0.000	1.137	0.220	1.437	0.000	1.278	0.000	1.174	0.010
Belgium	2.717	0.000	0.437	0.000	0.300	0.000	0.440	0.003	1.515	0.069	1.154	0.503
Denmark	6.029	0.000	1.436	0.007	0.709	0.182	0.981	0.939	4.176	0.000	3.124	0.000
Germany	5.418	0.000	1.053	0.672	0.617	0.025	0.897	0.592	2.771	0.000	1.904	0.001
Greece	4.546	0.000	1.096	0.517	0.433	0.003	1.108	0.646	3.193	0.000	3.251	0.000

Spain	2.158	0.000	0.530	0.000	0.210	0.000	0.302	0.000	1.331	0.169	1.405	0.086
France	4.275	0.000	0.492	0.000	0.230	0.000	0.275	0.000	1.144	0.527	1.466	0.043
Ireland	2.300	0.000	0.965	0.790	0.705	0.106	0.678	0.085	1.802	0.005	1.019	0.934
Italy	1.886	0.003	0.358	0.000	0.344	0.000	0.388	0.000	1.706	0.006	1.882	0.001
Luxembourg	5.260	0.000	0.429	0.000	0.296	0.000	0.330	0.000	1.621	0.032	1.320	0.196
Netherlands	4.323	0.000	0.601	0.001	0.279	0.000	0.757	0.236	3.328	0.000	2.528	0.000
Austria	3.271	0.000	1.574	0.001	0.553	0.041	1.344	0.182	3.173	0.000	1.314	0.238
Portugal	2.523	0.000	0.375	0.000	0.300	0.000	0.496	0.004	1.348	0.177	1.041	0.853
Finland	5.017	0.000	0.783	0.106	0.432	0.005	0.741	0.257	4.773	0.000	2.557	0.000
Sweden	1.567	0.071	0.499	0.000	0.529	0.016	0.711	0.169	1.796	0.009	1.083	0.726
UK	2.792	0.000	0.870	0.282	0.478	0.002	0.964	0.853	1.954	0.001	2.182	0.000
Iceland	1.758	0.043	0.581	0.002	0.356	0.001	0.990	0.967	4.873	0.000	3.404	0.000
Norway	4.797	0.000	0.490	0.000	0.469	0.008	1.295	0.256	4.911	0.000	3.514	0.000
Liechtenstein	4.837	0.000	0.610	0.001	0.508	0.005	0.877	0.547	3.680	0.000	1.613	0.033

Note: DK/NA observations have been dropped from the sample. Base level: "It never came to your mind."

Source: *Flash Eurobarometer Surveys* 134 and 146 (conducted in 2002 and 2003).

Table 3 Some diagnostic measures of the multinomial logit model

	With "preference" variable (see Table 2)	Without "preference" variable
Log-likelihood	−22301.320	−23430.792
LR statistic	6104.714 (df: 156)	3845.769 (df: 150)
McFadden R^2	0.120	0.076
Nagelkerke R^2	0.310	0.208
Akaike inform. crit.	2.550	2.677
Bayesian inform. crit.	2.621	2.746

statistics are reported for the same analysis but with the preference for self-employment variable omitted. Obviously, the explanatory power drops but the size and the significance of the coefficients (not reported in the present article) are roughly the same.[33]

For each pair of engagement levels, we conducted a Wald test (asymptotically χ^2 distributed with 26 degrees of freedom, 5% critical value: 38.885) to test for equal coefficients for the particular pair of levels. The results of these tests are given in Table 4. All null hypotheses can be rejected at 1%; the least convincing rejection is in the case of engagement levels "Taking steps" and level "Business <3 yrs." We also conducted this test for country effects only. The results are also in Table 4 (between brackets, 5% critical value with 18 degrees of freedom: 28.869). Again, all null hypotheses can be rejected at 1%, except for the combination of "Taking steps" and "Business <3 yrs" (with *P*-value 0.03).

We also investigated the redundancy of country dummies (null hypothesis: all coefficients of country dummies are equal to zero). For the various levels, we

[33]Recall that the preference variable reports the answer to a hypothetical question where the respondent is freed from any real life constraints when asked about her preference between self-employment and paid employment. For this reason, we believe that this variable does not duplicate the information contained in the dependent variable but rather translates an inner preference for an entrepreneurial carrier which may or may not have materialized depending on the constrains and opportunities faced by each individual. Moreover, the preference question refers to self-employment, which does not necessarily require owing a business, while the dependent variable deals with starting a business. Inspection of the data shows that 38% of those announcing a preference for self-employment claim never having thought about starting a business while 33% of those in the thinking phase or beyond (including the "Gave up" and "No longer" levels) declared a preference for paid employment.

Table 4 Results of Wald-tests for equal coefficients across engagement levels and equal country coefficients per engagement level

Across levels	Never thought	Thinking	Gave up	Taking steps	Business <3 years	Business >3 years	No longer
Never thought							
Thinking	1814.30						
	(306.35)						
Gave up	577.05	697.16					
	(246.75)	(254.44)					
Taking steps	671.72	108.47	421.23				
	(85.97)	(43.72)	(164.31)				
Business <3 years	721.00	188.81	357.01	77.78			
	(104.83)	(55.86)	(152.12)	(30.97, $p = 0.03$)			
Business >3 years	1414.10	896.25	516.29	347.80	181.23		
	(237.56)	(211.32)	(128.42)	(128.53)	(75.77)		
No longer	908.05	1449.76	522.76	672.92	535.82	433.11	
	(177.23)	(196.89)	(130.19)	(125.22)	(88.87)	(54.87)	
Per level		246.75	306.35	85.97	104.83	237.56	177.23

Note: the Wald-test for equal country coefficients across levels is between brackets.

computed a Wald statistic (χ^2 distributed with 18 degrees of freedom, 5% critical value with 18 degrees of freedom: 28.869; base level: "Never thought about it"). They are shown in the bottom row of Table 4.[34] In the concluding remarks to the

[34]It is not straightforward to compute a measure of explanatory power for each engagement level in the multinomial logit model. One solution is to compare the observed and predicted frequencies of the levels. In the actual sample, the frequencies of the seven levels are 0.55, 0.10, 0.13, 0.03, 0.04, 0.08, and 0.08 (for "Never thought," "Gave up," "Thinking." "Taking steps," "Business <3 years," "Business >3 years," and "No longer," respectively). When making forecasts for each level (for each individual) and assigning the level to each individual with the highest probability, then the frequencies of predicted levels amount to 0.87, 0.00, 0.09, 0.00, 0.00, 0.03, and 0.01. Another solution is identify the fit of the different engagement levels is to compute the average predicted probability for each engagement level. For all observations belonging to the "Never thought about it" level we predict the probability of classification in this level. Averaging this number across individuals and repeating this exercise for all other categories gives the following outcome for the respective levels: "Never thought" (9697; 0.62); "Gave up" (1715; 0.12); "Thinking" (2376; 0.23); "Taking steps" (482; 0.07); "Business <3 yrs" (635; 0.07); "Business >3 yrs" (1333; 0.15); "No longer" (1383; 0.13) where the number of observations and the average prediction is between brackets. Note that these predictions are only considered for the observations representing the specific level. Predictions can also be based on all observations. In this case, the outcomes are as follows (17,621 observations for all predictions): "Never thought" (0.55); "Gave up" (0.10);

present article under the denominator of future research, we will discuss that, given the data set, we are unable to correct for reversed causality and endogeneity.

Lastly, the Independence of Irrelevant Alternatives (IIA) assumption underlying the multinomial logit model is investigated. This is done as follows: one by one all engagement levels are omitted from the analysis and the full model parameter estimates are compared with the results after specific levels are omitted. It appears that the IIA assumption is not violated if we delete any level other than "Never thought." However, if we delete this level the odds ratios change and therefore the odds ratios of the levels other than "Never thought" are dependent on the presence of this level. This suggests that there is a clear difference between "Never thought" and the set of all six alternatives. This is intuitively appealing because it stresses the profound differences between those for whom entrepreneurship is not an option and those exposed to any form of entrepreneurial engagement.

Concluding that our model is sufficiently robust, we first summarize the main results of Table 2. We concentrate on the effect of six variables: gender, age, education, financial obstacles, administrative complexity, and risk tolerance. We will also discuss country effects. Second, we will confront the gist of our results with those mentioned in the literature part of the present article. Lastly, we will provide some significant results when looking at the odds of belonging to a given level relative to other levels than "It never came to your mind." This last exercise in particular shows the richness of our approach when compared to standard binary choice ones.

4.2 Gender

Relative to not thinking about setting up a business, the odds of any other option are consistently higher for men than for women. The difference is accentuated when evaluating the odds of having an active business where, relative to not considering starting one, the odds for men are almost twice those of women for businesses with <3 years, and two and a half as high for businesses with >3 years. Remark that these results are obtained from a regression where preferences for self-employment have been accounted for. It suggests that this gender differential goes beyond the often observed lower entrepreneurship preferences of women. This suggests two fronts for action if women are to become better represented in the entrepreneurial world. First, to act at the level of preferences by investigating and addressing the factors responsible for this possible lack of entrepreneurial drive (Minniti and Nardone, 2007). And second, to address more directly the obstacles faced by women that may

"Thinking" (0.13); "Taking steps" (0.03); "Business <3 yrs" (0.04); "Business >3 yrs" (0.08); "No longer" (0.08) where again the average prediction is between brackets. The latter two results suggest that "Never thought about it" is identified best. The adequate performance of this level might be caused by the large number of respondents identifying themselves with this engagement level.

be hindering the materialization of entrepreneurial spirit into actual entrepreneurship. Moreover, the fact that this gender gap is particularly strong for the active business phases may have important policy implications. Although we do not present the results in the present article, it can be shown that the odds of having an old business relative to a younger one are higher for men than for women suggesting lower survival chances for women. An investigation of the factors behind this could lead to policy lessons and hint at initiatives to decrease this disparity. If such factors prove to be linked to market failures or distorted playing field conditions, correcting it would allow fuller tapping into the entrepreneurial energy of an economy.

4.3 Age

Age has a negative impact on the odds of "Thinking," "Taking steps," or "Having a young business" relative to "Never having thought of starting a business." However, its impact becomes positive on the odds of "Having an old business" and on "No longer having a business," again relative to "Not thinking of starting one." This last effect is most likely the result of the natural fact that to have an old business or to have stopped having one takes time in life. Though not reported here, the effect of age on the odds of having an older business relative to having a younger one is also positive illustrating precisely the natural demographic fact that owners grow older along with their businesses. More interestingly, and again not reported, the odds of no longer being an entrepreneur relative to any other category increases with age, suggesting a lifecycle interpretation for this category of exit from entrepreneurial life.

4.4 Education

Relative to "Never thought about it," the odds of any other category, with the exception of "No longer being in business," displays a positive relationship with educational level. This suggests that education matters in triggering at least the thought of starting a business even if the thought is later abandoned. Given the significant effect of education on contemplating or having contemplated starting a business, it is essential to investigate its effect on other pairs of categories. The impact of education is particularly interesting on the odds of older versus younger businesses since it unveils some information on the role of education on the survival of businesses. Results not reported indicate that education of the owner has apparently no impact on whether he owns a young or an older business suggesting that owners' education does not affect survival rates.

4.5 Administrative complexities

Relative to never having considered setting up a business, the odds of having thought and given up are not significantly affected by the perception of administrative complexities. However, the odds of other more active entrepreneurial positions,

such as actually having started one (whether active for less or longer than 3 years) or having once been an entrepreneur, are significantly negatively affected by a perception of administrative complexity. The results suggest that for those who gave up on the idea of starting a new business the recognition of such obstacle is not binding enough to "make" them statistically different from those never having considered an independent status. What is revealing in these results is the fact that when it comes to a more "engaged" entrepreneurial position, these obstacles do play a role and one that hinders entrepreneurship. This result provides a somehow deeper insight to policy makers concerning the most "effective" target audience for policy initiatives in the area of administrative simplification. It suggests that once the entrepreneur has materialized as a business owner, administrative complexities play a role. Recent initiatives in several European countries and at the European Union level have been taken to regulate better and in particular to decrease by 25% the administrative burdens faced by firms. These efforts and political commitments testify to the awareness in policy circles of the hindering effect of administrative hurdles to entrepreneurial activity and economic growth.[35]

4.6 Lack of financial support

Regarding how the lack of financial support influences, the important result is the lack of significance of this variable across the board. In plain words this result means that the fact of acknowledging a lack of financial support plays no role in an individual's attitude toward entrepreneurship. Unlike with administrative obstacles, lack of financial support does not seem to discourage an active involvement in entrepreneurial activity; even for those categories reflecting an effective business activity their odds relative to not considering an entrepreneurial activity are not significantly affected by a perception of financial obstacles. The result concerning financial obstacles is in stark contrast with the result for administrative complexities where the expected negative effect is evident for engaged entrepreneurship. Clearly, this unexpected result needs further investigation. In interpreting these results we have to bear in mind that the odds under consideration here are those of each level relative to a lack of interest for entrepreneurship. The obvious question is then whether a lack of financial support may play a role in the odds of other pairs of categories. Could it be the case that this obstacle is important in determining the odds of actually having a business relative to thinking about starting one or relative to having given up? Or, could it play a role in the odds of having an older business relative to having a younger one? Tests along these lines show that this variable has no significant effect on the odds of any pair of engagement levels.

[35]See, http://ec.europa.eu/growthandjobs/areas/fiche03_en.htm#docs for information on European Union and Member States' efforts in the area of "better regulation."

4.7 Risk tolerance

Not too surprisingly, being risk tolerant increases the odds of belonging to any category where having a business has been contemplated relative to never having considered such an option.[36] When looking at the odds of having an older business relative to having a younger one, results not reported show that risk tolerance decreases these odds, but not significantly, so the idea that being risk tolerant decreases survival rates is not supported by these results.

4.8 Country dummies

The large number of individual country dummies for every level prevents an exhaustive discussion. However, the most relevant results are that

- Strikingly, the odds of having considered and subsequently having given up starting a business relative to not having thought about it are much stronger for any single European country than for the United States. Giving up rather than even considering an entrepreneurial activity appears to be a characteristic more present in the European population.
- When it comes to thinking about setting up a business as opposed to not considering it at all, the result is almost the opposite of the preceding: with the exception of Denmark and Austria, no European country has higher odds than the United States. Most countries have significantly lower odds and a few, such as Germany, Greece, Ireland, and the United Kingdom, are at par with the United States.
- Looking at a more engaged stage in the entrepreneurial process, currently taking steps to start a new business, relative again to showing no interest, the results are the following: with the exception of Denmark, and Ireland for which the odds are not statistically different than in the United States, all other European countries fare less well than the United States.
- Relative to not considering an entrepreneurial activity, the odds of having a "young" business (<3 years) are never higher for European countries than for the United States (for some countries they are statistically lower and for others they are at par).
- The situation changes dramatically when we look at the odds of having an older business (always relative to not wanting to start one). Here, no country scores below the United States and with the exception of Belgium, Spain, France, and Portugal for which the situation is not statistically different from the United States, all other European countries have significant higher odds than the United States.
- Finally, it remains to see how nationality influences the odds of having once started a business but not being any longer an entrepreneur, relative to not being

[36]The only exception is in "Taking steps" where risk tolerance does not change its odds relative to "Never thought about it."

interested in such activities. Here, no European country has lower odds than the United States (some are at par while others are clearly above). This class of "have been entrepreneurs" is of course a heterogeneous group which makes it difficult to comment on these results. Its message would have to be tempered by the information on why the respondent is no longer an entrepreneur: has he succeeded in his venture and transferred it or has the business been a failure? Unfortunately, we do not possess this type of information.

Comparing our seven engagement level results with those of the earlier—mainly two engagement level—literature shows that:

- Our results are in line with those of the earlier literature that men have a higher probability than women to engage or stay in entrepreneurship. See Blanchflower *et al.* (2001), Reynolds *et al.* (2002), and Minniti *et al.* (2005). That this gap is larger in active business phases is an additional piece of information that could not have been detected using the methodology presented in earlier literature. Using ordered logit estimation and 2004 Eurobarometer data van der Zwan *et al.* (2008) conclude that "Men move more easily through the process than women while the effect of this variable decreases with the level of entrepreneurial engagement." Remarkably, controlling for preferences in binary choice models usually eliminates the gender gap (Verheul *et al.*, 2008).
- Our results concerning age and education are not in contrast with those of the earlier literature. The effect of age changes with the engagement level. See Storey (1994), Davidsson (2006), and van der Zwan *et al.*, (2008). Like in most other studies (Parker and van Praag, 2006), the effect of education suffers from the risk of endogeneity. Given the variety of results found in the literature for the impact of these variables, particularly for education, any further comparison effort would have to be done case by case.
- Not surprisingly, relative to not thinking about setting up a business, the odds of any other category are consistently higher for those having a preference for self-employment. Similar results are found in binary choice models (Grilo and Irigoyen, 2006) and ordered logit models (van der Zwan *et al.*, 2008).
- The important role of the perception of administrative complexities has also been identified in two studies using similar Eurobarometer data but using standard binary choice models (Grilo and Thurik, 2005a; Grilo and Irigoyen, 2006). It is also established in van Stel and Stunnenberg (2006). The main difference in the present article, which could not have been captured in the papers mentioned, relates to the additional insight at which stages administrative complexities play a hindering role.
- Since Evans and Jovanovic (1989) actual liquidity constraints play an important role in the theory and empirics of binary occupational choice models. They are generally found to have the expected negative impact on the entrepreneurship decision. Davidsson (2006), however, concludes that they hardly seem to impact

the nascent entrepreneurship decision. In the present study, we use the perception of financial support and find no influence. This lack of statistical significance of the perception of financial support has also been identified in two studies using similar Eurobarometer data but using standard binary choice models (Grilo and Thurik, 2005a; Grilo and Irigoyen, 2006). It could have been argued that a binary setting overlooks the "intermediary" levels before actually having a business and that it is in these stages that lack of financial support may prove to be binding. The lack of statistical significance across the board brings further strength to the results in previous studies and suggests that lack of financial support is not an obstacle in any of the steps of the entrepreneurial process.

- Our results confirm earlier binary choice results in that corrected for individual covariates large cross-countries remain in the explanation of the determinants of entrepreneurship (Blanchflower, 2000, 2004; Blanchflower *et al.* 2001; Grilo and Thurik, 2006). Moreover, when compared to the United States, European countries show less entrepreneurial energy in the "contemplative" levels and more in the "engaged" levels (Acs, *et al.*, 2005).
- By and large, risk tolerance seems to increase the odds of belonging to any other category relative to not thinking about setting up a business. Risk tolerance is one of the usual drivers in occupational choice models (Parker, 2004). Yet, there is evidence that its impact on actual status is through preferences (Grilo and Irigoyen, 2006; Grilo and Thurik, 2006).

In the presentation of the results chosen here we looked systematically at the odds of belonging to a given level relative to the level "It never came to your mind." Another way of looking at these results would be to look at odds of other pairs of levels. One might want to know what the impact is of a certain explanatory variable on the odds of having an older business relative to having a younger one. The value of these impacts, though not its statistical significance, can be easily obtained from Table 2.[37] Below six instances of statistically significant impacts are given.[38]

The odds of having a business, regardless of its age, relative to having given up setting a business are negatively influenced by the perception of administrative complexities but not by lack of financial support. In the same spirit, the odds of having a business relative to thinking about it also decrease in the presence of perceived administrative complexities but are not affected by lack of financial support. The odds of "Having an old business," >3 years, relative to "Having a young business," <3 years, are increased by belonging to any of the European countries in the sample rather than being American. This suggests that business survival is more

[37]The size of the impact of a variable on the odds of level *X* relative to level *Y* can be obtained by dividing the odds of level *X* relative to the base level by the odds of level *Y* relative to the base.

[38]We will not burdon the present article with the full set of tables. They are available from the authors.

likely in the EU than in the United States. Whether this is a good or a bad sign depends on the reasons behind this higher survival. If it results either from excessive caution in entry by avoiding any risk or from a less competitive environment that allows inefficient firms to survive on protected rents, then this is a sign of lack of entrepreneurial dynamism with costs to overall economic performance and growth. Being male also increases the odds of having a longer established business.[39] In general, the odds of "Taking steps" relative to "Thinking" are decreased by belonging to a European country rather than being American (significant for 9 of the 15 EU countries). Also, the odds of "Gave up" relative to "Thinking" are increased by belonging to a European country. Finally, the same holds true for the odds of "Gave up" relative to "Taking steps." The last three examples suggest that perseverance in the "contemplative" engagement levels is lower in the EU than in the United States.

5. Concluding remarks

The determinants of entrepreneurship have typically been investigated in the context of a binary choice model. We believe that setting up a business is best described as a process rather than the result of a single binary choice and that the determinants of entrepreneurship are not necessarily equal across the different engagement levels of this process. This is precisely where the present article attempts to contribute to the literature. The survey data covering the 15 old EU Member States, plus Norway, Iceland, Liechtenstein, and the US and the use of a multinomial logit model enable to establish the effect of socio-demographic and perception and preference variables on entrepreneurial engagement levels such as "Thinking about it," "Taking steps for starting up," "Having a young business," and "Having an older business," while controlling for country differences. This new picture provides a remarkable abundance of results which is entirely the fruit of our new approach using several engagement levels. The most important findings are that:

- Relative to "Not thinking about it," the odds of any other option are higher for men than for women and this effect is stronger for "Having an active business" than for any other level.
- Perception of administrative complexities has no effect on the odds of "Gave up," "Thinking about it," and "Taking steps" relative to "Never thought about it."
- Perception of administrative complexities plays a negative role for higher levels of engagement ("Having an active business").
- Perception of lack of financial support has no discriminative effect across the categories.

[39]Age also has a positive impact on these odds but this does not necessarily mean that older entrepreneurs have better business survival chances.

- European countries have lower odds than the United States for levels of engagement up to "Having a young business" relative to "Never thought about it."
- European countries have higher odds than the United States for the level "Having an older business" both relative to "Never thought about it" and to "Having a young business."

There are many avenues for future research building on the present model and its results. We mention only three. First, future research should deal with the explanation of the country differences: to what extent are cultural aspects, sector composition of economic activity, market legislation, tax environment, bankruptcy law, job security, and social security regimes, etc. determining factors.[40] Second, the possible existence of reversed causality between the entrepreneurial engagement levels and some of the entrepreneurship determinants considered in the present setup deserves further investigation. Variables such as preferences for self-employment; risk tolerance; financial resources; and even the perception of administrative complexities are likely to change through time and, in particular, to be affected by entrepreneurial experiences. For instance, while greater risk tolerance and financial resources will likely increase the probability of becoming an entrepreneur, it is also likely that an experienced entrepreneur, owning a successful, older business will face fewer financial constraints (Parker, 2004) and will have a different perception of risk than an individual that is taking steps toward, or thinking about becoming self-employed. Our present cross section data set does not allow for the investigation of the reversed causality issue. Third, the world of the explanation of entrepreneurial choice and performance is known for its endogeneity problems (Parker and van Praag, 2006). They occur if there is a factor influencing both a regressor and the dependent variable (entrepreneurial choice and performance). In our case, preference for self-employment, education, and risk tolerance are likely candidates. Attempts have been made to solve the endogeneity issue in regression models. One can make use of instrumental variables (IVs) in that variables have to be found that are correlated with the regressor, but are uncorrelated with the disturbance term. Generally, it is difficult to find IVs having these properties mainly because the correlation with the regressor is unconvincingly low. Compulsory schooling laws are a well-known instrument for the education regressor because it is unlikely to directly influence the occupational choice or performance.[41] These IV-models can be estimated in

[40]See, Wennekers *et al.* (2002) for some general insights on the role of heterogeneity on the country level when explaining entrepreneurial activity. In Grilo and Thurik (2006), a probit approach is used to investigate the differences in actual and latent entrepreneurship in the postcommunist Europe and the market economy members of the European Union. In Grilo and Thurik (2005b), the present model is used to establish differences between the postcommunist members of the European Union and the market economy ones.

[41]Angrist and Krueger (1991) use (seasonal) quarter of birth as an instrument for schooling. They only establish a small bias.

a classical way by, for example, 2SLS (two-stage least-squares).[42] A Bayesian analysis of the IV-regression model has become increasingly popular (Kleibergen and Zivot, 2003). Bayesian analysis may be useful when finite sample bias occurs in case of weak instruments.[43] Our data set does not allow for the inspection of the endogeneity bias for it does not contain credible IVs.

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[42]See, van der Sluis *et al.* (2006) and van der Sluis and van Praag (2007) showing that the returns to education increase if this regressor is instrumented. See, Parker and Praag (2006) showing that the influence of capital constraints increases if this regressor is instrumented.

[43]Hoogerheide *et al.* (2007) show how the shapes of posterior distributions in the IV-model depend on the strength of the instruments and the level of endogeneity for different prior distributions.

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