

Entrepreneurship and Immigration: European Cross-country Evidence. *

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Abstract

This paper contributes to the knowledge of the economic effects of populations movements by investigating the empirical link between migrations and entrepreneurship in European countries. Using a large survey sample, it studies the effect of the immigration status across all the stages of the entrepreneurial process: interest in starting a new business, effectively starting, running a new business and managing an established business. The contributions of this paper are as follows. Firstly, it presents for the first time cross-country evidence based on a large sample of individual observations. Secondly, it uses a sequential probit model with sample selection to capture the dependence between entrepreneurial stages. The findings tell that immigration has generally a positive effect on entrepreneurship and immigrants are more willing to engage in entrepreneurship. The study, however, did not find any substantial difference between natives and migrants in the following steps of entrepreneurship, which suggests that migrants' entrepreneurial potential is not fully exploited.

Key-words: Entrepreneurship; Immigration; Cross-countries; Sequential Logit; Sequence of Probit with sample selection; GEM.

Since the seminal contributions of Adam Smith and Schumpeter (1934), economists regard entrepreneurship as a driver of economic growth. Many theoretical and empirical studies analysing the links between entrepreneurship and growth variables from an aggregate perspective highlight how entrepreneurs favour innovation, knowledge spillovers, and create new jobs (Audretsch, 2007; Braunerhjelm et al., 2010; Wennekers and Thurik, 1999).

The availability of survey data, collected at firm and individual level, have opened new venues of research. In particular, individual-level data permit to answer important and policy-relevant questions such as: why people become entrepreneurs? What are the features of the typical entrepreneur? What are the factors that favour/hinder entrepreneurial efforts, or increase the probability of success of business ventures? As a result, researchers have used surveys data to analyse the individual features of entrepreneurs and studied the effects of entrepreneurship on firms dynamics (e.g. Arenius and Minniti, 2005) The evidence on migrants entrepreneurs, however, is scarce. This is spite of anecdotal evidence suggesting a strong contribution of immigrants to entrepreneurship (Wadhwa,

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2011; Hohn et al., 2012). Some descriptive statistics report that migrants are more likely to engage in entrepreneurial activities than non-migrants (Xavier et al., 2013; OECD, 2010). The few studies exploring the link immigration-entrepreneurship focus on self-employment decisions rather than entrepreneurship per-se (Constant and Zimmermann, 2006), or investigate factors motivating the entrepreneurial effort (Irastorza and Pena, 2007). Other studies stress the role of creativity and human capital in shaping the links between migrants' presence and positive economic performance using regional data, but the link with entrepreneurship is somewhat tenuous Piergiovanni et al. (2012); Storper and Scott (2009).

This article uses a large cross-country dataset to study whether the immigration background has an impact on entrepreneurial attitudes and efforts. Previously, Peroni et al. (2016) found a positive link between immigration and entrepreneurship in Luxembourg, a country where about half of the labour force is immigrant. The study modelled entrepreneurship as a process, from the interest to start a new business, to starting, running a new business and managing an established business. The large sample size of the present study allows us to address a limitation of the previous study, namely the assumption that unobservable features that affect the relationship of interest are the same at every stage of the entrepreneurial process. Furthermore, it permits more precise estimations of individual effects. To the best of our knowledge, no other study has analysed systematically the link between immigration and entrepreneurship using a cross-country individual dataset.

The result is a better understanding of the conditions and barriers that migrants face in starting new businesses. Empirical results show that the willingness to engage in entrepreneurial activities is higher for migrants than for nationals.

1 Data

This study uses data from the Adult Population Surveys (APS) of the Global Entrepreneurship Monitor (GEM) for the year 2013 for 16 European countries.¹ In 2013, the APS collected information on the immigration background of respondents. After data cleaning, the final sample includes 47217 observations.

GEM is an internationally harmonized source of individual-level information on people's attitudes towards entrepreneurship and characteristics of entrepreneurs. The GEM survey is currently administered in more than 100 countries world-wide, covering more than 75% of the world population. The survey is conducted on a sample of (minimum) 2000 adults per country per year. The questionnaire comprises two sets of questions, respectively a core one and a special topic one which varies each year.

2 Method

The GEM framework models entrepreneurship as a process comprising the following sequence of stages:

¹Belgium, Croatia, Czech Republic, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Portugal, Slovenia, Spain, Sweden, United Kingdom. Hungary, Poland and Romania are excluded because of data quality issues, as these countries are reporting very low number of immigrants.

1. Inactive;
2. Potential (expecting to start a new business within the next three years);
3. Nascent entrepreneur (involved in setting up a business);
4. New entrepreneur (owner-manager of firm younger than 42 months that pays wages during last three months);
5. Established entrepreneur (owner-manager of firm older than 42 months that pays wages during last three months).

Each entrepreneur passes through intermediate steps before setting up an established business; at each stage, the entrepreneur can stop or proceed to the next phase. We model this process as a sequence of regressions (logits and probits with sample selection). At each stage, we estimate the probability to reach next stage accounting for several individual and firm characteristics. This model allows us to establish whether the probability to successfully proceed over subsequent stages differ over immigration status (nationals versus immigration).

2.1 Dependent variables

Individuals who wish to establish a firm cross the various stages. The probability of crossing stages, in turns, depends on individual characteristics and institutional factors. The various phases are observed via respondents' self-declarations of involvement in entrepreneurial activity. In other words, respondents are asked to situate themselves/their business in a specific phase of the entrepreneurial process. Based on these answers, we build a set of four dummy variables, one for each phase of the process. These variables take value 1 if the respondent is in a specific or higher stage and zero otherwise. These dummies serve as the regressions dependent variables.

Table 1 gives descriptive statistics for each stage, and shows that first generation migrants are generally more active in entrepreneurial activities over all the stages of the entrepreneurial process.

2.2 Variables of interest and control variables

The main independent variable is the migratory background of the respondents. We distinguish the respondents in nationals (individuals born in the country) and immigrants (individuals born abroad).² The analysis uses a set of individual characteristics (fear of failure, skills, age, sex, education, occupation, income) and firm features (sector of activity) as control variables. They are described below. The entrepreneurial attitude is measured by three dummy variables. Each variable takes value 1 if the respondent: a) knows someone who started a business b) perceives himself as skilled and experienced enough to start a new business c) fears to fail in starting a new business. The attitude towards starting a new business are relevant only in first phases of entrepreneurship process (up to effectively starting a new business) and are dropped when

²Second generation immigrant (individuals born in the country with at least one parent born abroad) are numerically consistent only in few selected countries (Lanzieri, 2011) and in this study are assimilated to nationals.

Table 1: Descriptive statistics

	National	Immigrant	Total
Inactive	0.788	0.702	0.781
Potential entrepreneur or more	0.212	0.298	0.219
Nascent entrepreneur or more	0.131	0.141	0.132
New entrepreneur or more	0.0950	0.0927	0.0948
Established entrepreneur	0.0688	0.0594	0.0681

investigating later phases. The fear of failure allows to control for individual risk aversion. This addresses self-selection concern that may rise because risk prone individuals can also be more likely to migrate and start new businesses. We control for age, gender, education, occupation and income. Age is measured as a continuous variable ranging from 18 to 64 years. Gender is a dummy variable set to 1 if the respondent is male and 0 otherwise. Education is measured by a set of dummy variables respectively set to 1 if the respondent declares to have one of the following levels of education classified in line with the International Standard Classification of Education. Education categories are: a) Primary b) Lower Secondary c) Upper Secondary d) Post Secondary e) Tertiary (e.g. bachelor and higher). Employment status, implemented only in the first two phases of entrepreneurial process, is measured with a dummy set to 1 if the respondent is seeking a job and 0 otherwise. The availability of private financial resources to fund the business is observed through respondent's self-declaration of belonging to one of percentile of national income distribution: a) Lowest 33% b) Middle 33% c) Upper 33%. In later phases of entrepreneurial process, individual's income can be seen as a measure of the profitability of the business. The economic activities are observed according to the International Standard Industrial Classification (ISIC). Sectors are aggregated on the basis of knowledge intensity as defined by (EUROSTAT, 2008). Retained categories are: knowledge intensive services, Low knowledge intensive services and others (e.g. manufacturing). All variables are interacted with the immigration variable to capture the possible different influence on entrepreneurship process for people with different migratory backgrounds. Finally, to account for country specific features (i.e. labour market structures, economic opportunities), we include country fixed effects and the error term are clustered at country level. Descriptive statistics are reported in table 4 in the Annex.

2.3 Econometric model

This section presents the empirical strategy used in this analysis. As noted in previous sections, the GEM framework models entrepreneurship as a process comprising several stages. These include the intention to start a new business, the involvement in new ventures, and the survival of new firms. Thus, each entrepreneur passes through intermediate steps before setting up an established business; at each stage, the entrepreneur can stop or proceed to the next phase. To account for the GEM setting, we adopt a variant of the sequential model of Tutz (1991) proposed by Buis (2010). The idea is that only some people are potentially interested in starting a new business, and among them only a fraction will effectively start a new business. This framework allows us to establish whether the probability to successfully proceed over subsequent stages differ over immigration status (nationals versus immigration). The probabilities p that an individual proceeds through the various stages are as follows:

$$\hat{p}_{1i} = \frac{e^{(\alpha_1 + \lambda_1 Imm. + \beta_1 X_{i1})}}{1 + e^{(\alpha_1 + \lambda_1 Imm. + \beta_1 X_{i1})}} \quad (1)$$

$$\hat{p}_{2i} = \frac{e^{(\alpha_2 + \lambda_2 Imm. + \beta_2 X_{i2})}}{1 + e^{(\alpha_2 + \lambda_2 Imm. + \beta_2 X_{i2})}} \text{ if phase}_{1i} = 1 \quad (2)$$

$$\hat{p}_{3i} = \frac{e^{(\alpha_3 + \lambda_3 Imm. + \beta_3 X_{i3})}}{1 + e^{(\alpha_3 + \lambda_3 Imm. + \beta_3 X_{i3})}} \text{ if phase}_{2i} = 1 \quad (3)$$

$$\hat{p}_{4i} = \frac{e^{(\alpha_4 + \lambda_4 Imm. + \beta_4 X_{i4})}}{1 + e^{(\alpha_4 + \lambda_4 Imm. + \beta_4 X_{i4})}} \text{ if phase}_{3i} = 1 \quad (4)$$

Where i denotes the individual, and $Imm.$ the immigration background. One can see that this model is composed by 5 phases, resulting in 4 transitions from inactive to established entrepreneurs. Entrepreneurs can move to a new phase only if they have achieved the previous stage. The transition-specific intercept is α_k , with $k = 1, 2, \dots, 4$; λ_k , the coefficient of the immigration status, is the coefficient of interest; X is a vector of control variables.

In this work, we estimate two models that differ in the structure of the error terms of equations (1-4).

In line with previous study on entrepreneurship and immigration (Peroni et al., 2016), the first model (sequential logit) assumes that error terms are independent and distributed by the standard logistic distribution. The sequential logit is estimated by using the sub-sample constituted by individuals who have achieved that stage. As factors affecting the transition probabilities may vary over the sequence, we do not restrict the set of control variables to be the same at each phase.³ To capture possible differences between immigrants and non-immigrants for various levels of the control variables, we also include interaction

³ For example, questionnaire provides information about the sector of economic activity only after the starting of the new venture. Therefore only the last two phases include these controls. Similarly, individual characteristics (knowing some entrepreneurs, fear of failure, skills for starting a business and unemployment are more relevant only for the first two phases.

effects of the immigration variable *Imm*. with all individual control variables. Country fixed effects are included and error terms are clustered at country level.

The sequential logit (first model) assumes that error terms of each equation are independent. However, error terms of various transitions may be correlated, e.g. because of common omitted variables. In order to accommodate this correlation, we estimate a second model assuming that the error terms of equations (1-4) are pairwise correlated and distributed as bivariate normal distribution. Note that we are not interested in the probability of the success at the final stage as function of the previous successes, but to the impact of immigration at different stages.⁴

The second model is made of a sequence of probits with sample selection estimated on the sub-sample constituted by individuals who have achieved that stage. We name the second model as "sequential probit with sample selection". The Probit model with sample selection (Van de Ven and Van Praag, 1981) is an extension of the approach by Heckman (1979) to the case of dichotomous outcome. For each entrepreneurship phase, Probit model with sample selection estimates the probability that an individual successfully pass a given phase correcting for the selection bias introduced by the truncated sample of individuals that achieved previous phase.

In summary, first and second model differ only for the assumption of the distribution of the error terms. While the first model (sequential logit) is made of a sequence of independent logit model, the second (sequential probit with sample selection) is made of a sequence of probits models with sample selection.

3 Results

Empirical results show that the willingness to engage in entrepreneurial activities is higher for migrants than for nationals. At subsequent stages of the entrepreneurial process, however, migrants are less successful than non-migrants.

Table 2 and Table 3 report, respectively, marginal effects of migration on the probability of engaging in entrepreneurial activities obtained from a Logit model and a sequential Probit model with sample selection.

Average marginal effects on the transition probabilities for all variables are reported in table 5 and in table 6 in the Annex 5.⁵

Despite the different assumptions, results are really close. (We note that the ρ – the parameter that measures the significance of the selection mechanism – is statistically different from zero. This suggests that the sequential probit model with sample selection is the most appropriate model.) One can see that the probability that an immigrant becomes a potential entrepreneur is 7 percentage points higher than for a non-migrant (first column). Among potential entrepreneurs, however, the probability to start a new business is significantly lower for immigrants compared to nationals (nearly 10 percentage point). Simi-

⁴Pairwise correlations can be seen as a special case of a multivariate probit, where each error term is cross-correlated with all other error terms. We attempted to fit a quadri-variate model with sample selection using the `-cmp-` command (Roodman, 2011). However, the model does not converge. However, this is not particular relevant for the purpose of this research because we are interested in the impact of immigration *at each different stages* and not in the probability of success *at final stages* as function of the previous successes.

⁵Model estimates are available upon request from the authors.

Table 2: Seqlogit Average Marginal effect.

	(1) Potential	(2) Nascent	(3) New	(4) Established
Immigrant	0.0750*** (0.000)	-0.100*** (0.000)	-0.0319 (0.170)	-0.0462*** (0.006)
<i>LL0</i>	-24789.2	-6931.2	-3688.5	-2663.8
<i>LL</i>	-20605.4	-5872.1	-3352.7	-2291.1
R2	0.169	0.153	0.0911	0.140
Success	10317	6220	4478	3215
Unsucess	36900	4097	1742	1263
Obs.	47217	10317	6220	4478

Average Marginal effects conditional to success in previous steps. (1) computed on the whole population. Other equations are estimated only on observations that success in the previous stage. All estimations are computed interacting immigration variable with all variables.

p-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

lar results are found for the subsequent steps of the entrepreneurial process, i.e. running and successfully establishing a new firm.

Using data for Luxembourg, Peroni et al. (2016) found that immigrants are more willing to engage in entrepreneurship. The study, however, did not find any substantial difference between natives and migrants in the following steps of entrepreneurship. This difference in results may be due to several reasons: barriers to migrant entrepreneurs may be lower in Luxembourg than in other countries; Luxembourg may attract immigrants whose unobservable skills are systematically different from immigrants settling in other countries. The results could also be due to a statistical effect: the size of the sample of the previous study might be too small to detect the effect of barriers to migrants.

Table 3: Sequential probit with sample selection average Marginal effect.

	(1) Potential	(2) Nascent	(3) New	(4) Established
Immigrant	0.0747*** (0.000)	-0.132*** (0.000)	-0.0266 (0.205)	-0.0460*** (0.007)
Rho	0.932		-0.835	-0.805
P-value Rho	0.00000498		0.00000138	0.0450
Uncensored	10317		6220	4478
Censored	36900		4097	1742
Obs.	47217		10317	6220

Average Marginal effects of achieving the phase conditional to success in previous steps. (1) based on selection equation of HeckProbit estimated on the whole population. (3) (4) are estimated only on uncensored observations of previous steps. (2) and (4) have same covariates in selection and main equation. Therefore, structural interpretation of (2) and (4) hinges on the functional form identification. All estimations are computed interacting immigration variable with all variables.

p -values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4 Conclusions

The public debate on the social and economic consequences of migrations and population movements is very lively but quantitative evidence on these topics is scarce. This study contributes to this knowledge by analysing how immigration affects entrepreneurship in European countries using survey data. Controlling for a set of individual characteristics (fear of failure, skills, age, sex, education, occupation, income) and firm features (sector of activity), the econometric results evidence the high propensity of first generation migrants to start a new business. At subsequent stages of the entrepreneurial process, migrants do have lower chances to succeed in starting a business and running a start-up or an established business than nationals. Results are confirmed also when an alternative modelling strategy is adopted.

However, as it is often the case in cross-sectional observational studies, the model results indicate partial correlations which are not necessarily causal relationships. For example, ‘risk-lover’ people may have more chances to both migrate and start a new venture. We note that the analysis controls for individual risk aversion mitigating this issue. Causal issue will be the object of future research. Overall, findings support a positive effect of immigration on entrepreneurship in European countries, but also highlight that migrants’ entrepreneurial potential is negatively affected by existing barriers. Our results suggest that immigrants have a large entrepreneur potential and policies reducing existing barriers to entrepreneurial success may facilitate economic activity of immigrant. If entrepreneurship increases economic activity, innovation and growth, our results suggest that reducing barriers to entrepreneurship

can unlock immigration potential, increase entrepreneurial activity and possibly increase acceptance of immigrants in Europe.

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5 Annex

Table 4: Descriptive statistics

	mean	sd
Immigrant	0.076	0.26
Inactive	0.78	0.41
Potential entrepreneur or more	0.22	0.41
Nascent entrepreneur or more	0.13	0.34
New entrepreneur or more	0.095	0.29
Established entrepreneur	0.068	0.25
Primary	0.050	0.22
Low secondary	0.18	0.39
Upper secondary	0.31	0.46
Post Secondary	0.14	0.35
Tertiary	0.32	0.47
Knowing someone who started a business	0.30	0.46
Having knowledge and skill	0.45	0.50
Fear of failure	0.48	0.50
Female	0.50	0.50
Age	43.5	13.7
Seeking employment	1.89	0.31
Lower 33%	0.36	0.48
Middle 33%	0.34	0.47
Upper 33%	0.30	0.46
Manufacturing and others	0.26	0.44
Knowledge Intensive Services	0.33	0.47
Low Knowledge Intensive Services	0.40	0.49
Observations	47217	

Table 5: Seqlogit Average Marginal effects

	(1) Potential	(2) Nascent	(3) New	(4) Established
Immigrant	0.0750*** (0.000)	-0.100*** (0.000)	-0.0319 (0.170)	-0.0462*** (0.006)
Primary	ref.	ref.	ref.	ref.
Lower Secondary	0.0274** (0.048)	0.00669 (0.783)	0.0188 (0.610)	-0.0235 (0.420)
Upper Secondary	0.0280** (0.015)	0.000727 (0.985)	-0.0555 (0.144)	-0.0407** (0.016)
Post Secondary	0.0222** (0.017)	-0.00857 (0.774)	-0.0695 (0.143)	-0.0949*** (0.000)
Tertiary	0.0402*** (0.000)	-0.00646 (0.835)	-0.0742* (0.081)	-0.0960*** (0.001)
Knowing someone who started a business	0.113*** (0.000)	0.103*** (0.000)		
Having knowledge and skill	0.233*** (0.000)	0.134*** (0.000)		
Fear of failure	-0.0657*** (0.000)	-0.0622*** (0.000)		
Seeking employment	-0.0144 (0.218)	0.313*** (0.000)		
Female	-0.0487*** (0.000)	-0.0542*** (0.000)	0.0151 (0.164)	0.0147 (0.195)
Age	-0.00262*** (0.000)	0.00914*** (0.000)	0.00843*** (0.000)	0.0122*** (0.000)
Lower 33%	ref.	ref.	ref.	ref.
Middle 33%	0.00212 (0.822)	0.0248*** (0.007)	0.0718*** (0.000)	0.0547*** (0.000)
Upper 33%	0.00863 (0.595)	0.0386** (0.025)	0.107*** (0.000)	0.0646*** (0.004)
Manufacturing and others			ref.	ref.
Knowledge Intensive Services			-0.0632*** (0.006)	-0.0899*** (0.000)
Low Knowledge Intensive Services			-0.0952*** (0.000)	-0.0869*** (0.000)
Country dummies	Yes	Yes	Yes	Yes
LL0	-24789.2	-6931.2	-3688.5	-2663.8
LL	-20605.4	-5872.1	-3352.7	-2291.1
R2	0.169	0.153	0.0911	0.140
Success	10317	6220	4478	3215
Unsuccess	36900	4097	1742	1263
Obs.	47217	10317	6220	4478

p-values in parentheses

All estimations are computed interacting immigration variable with all variables.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Average Marginal effects conditional to success in previous step

	(1) Potential	(2) Nascent	(3) New	(4) Established
Immigrant	0.0747*** (0.000)	-0.132*** (0.000)	-0.0266 (0.205)	-0.0460*** (0.007)
Primary	ref.	ref.	ref.	ref.
Lower Secondary	0.0260* (0.052)	0.00357 (0.882)	0.00961 (0.776)	-0.0240 (0.496)
Upper Secondary	0.0269** (0.020)	-0.00774 (0.858)	-0.0628* (0.077)	-0.0503** (0.019)
Post Secondary	0.0221** (0.018)	-0.0154 (0.636)	-0.0836* (0.056)	-0.112*** (0.000)
Tertiary	0.0412*** (0.000)	-0.0216 (0.514)	-0.0877** (0.031)	-0.109*** (0.002)
Knowing someone who started a business	0.115*** (0.000)	0.0935*** (0.000)	0.0328*** (0.000)	
Having knowledge and skill	0.233*** (0.000)	0.125*** (0.000)	0.0559*** (0.000)	
Fear of failure	-0.0633*** (0.000)	-0.0598*** (0.000)	-0.0221*** (0.000)	
Seeking employment	-0.0163 (0.144)	0.337*** (0.000)	0.234*** (0.002)	
Female	-0.0493*** (0.000)	-0.0510*** (0.002)	0.0229** (0.019)	0.0159 (0.181)
Age	-0.00260*** (0.000)	0.00970*** (0.000)	0.00816*** (0.000)	0.0131*** (0.000)
Lower 33%	ref.	ref.	ref.	ref.
Middle 33%	0.00243 (0.786)	0.0261** (0.015)	0.0533*** (0.000)	0.0578*** (0.000)
Upper 33%	0.00883 (0.572)	0.0368** (0.033)	0.0791*** (0.000)	0.0695*** (0.001)
Manufacturing and others			ref.	ref.
Knowledge Intensive Services			-0.0590*** (0.006)	-0.0965*** (0.000)
Low Knowledge Intensive Services			-0.0894*** (0.000)	-0.0945*** (0.000)
Country dummies	Yes	Yes	Yes	Yes
Uncensored	10317		6220	4478
Censored	636900		4097	1742
Obs.	47217		10317	6220
Rho	0.932		-0.835	-0.805
P-value Rho	0.00000498		0.00000138	0.0450

All estimations are computed interacting immigration variable with all variables. (1) based on selection equation of HeckProbit estimated on the whole population. (3) and (4) are estimated only on uncensored observations of previous steps. (2) and (4) have same covariates in selection and main equation. Therefore, structural interpretation of (2) and (4) hinges on the functional form identification. In (3) the indirect average marginal effects on the main equation of the Heckprobit are reported for: Knowing some entrepreneurs, fear of failure, skills for starting a business and unemployment.

p -values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$