

The young self-employed tertiary graduates in Europe^[1]

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The transition of European tertiary graduates to labour market is increasingly difficult. In order to promote job creation, European Union recommends self-employment and entrepreneurship (Eurobarometer, 2012). Based on the responses of 214674 individuals, from the 28 EU member states, to “European Labour Force Survey” (EU-LFS) 2013, we investigate to what extent country of residence, education level, field of study, and gender, influence the self-employment rate of young tertiary graduates. Our findings suggest that self-employment rate cannot be explained by academic level, nor by field of study, contrary to country of

residence, that assumes a huge importance on this issue: Italy and Greece feature the highest likelihood of being self-employed within the Union. Focusing on self-employment of managers, once more the results show the importance of country of residence: France and United Kingdom have the lowest probabilities, while Italy and, specially, Greece have the highest ones. Finally being a woman decreases the likelihood of a manager turns into an entrepreneur.

Keywords

Self-employment, Tertiary graduates; European youth labour market

1. INTRODUCTION

The transition from university to labour market is increasingly difficult, and show clear North–South differences in Europe. The greatest obstacles arise in Spain, Portugal and Poland, and the lowest in Anglo-Saxon and Nordic countries (Green & Livanos, 2015). Improving university-to-work transitions and ensuring better career opportunities for youth, after labour market entrance, are goals to raise the productive potential of the economy and to increase social cohesion (Quintini & Martin, 2014).

As it is well known, the great advantage of being employee is job security, so when it does not exist, other options should be considered. The flexicurity legitimated, by economies dynamics, led insecurity, precariousness and vulnerability to transition to labour market (Kovács, 2013).

The flexicurity stimulates and supports the creation of jobs, but at the same time promotes self-employment and entrepreneurship, because security of a “non term contract” disappears, and the chance to increase incomes, can compensate the risk of the creation of own job. In order to promote job creation, European Union recommended self-employment and entrepreneurship (EU, 2015).

In this paper we are mainly interested in understanding how country of residence, education level, field of study and gender affects the likelihood of self-employment on young tertiary graduates, and on managers with tertiary education.

The paper starts with a theoretical analysis of entrepreneurship as a labour option to young tertiary graduates (section 2), and proceeds with data and methodology (section 3). On section 4 we estimate the probit models of self-employment, to young tertiary graduates, and to managers with tertiary graduation, and we discuss the results. Finally we conclude on section 5 with a synthesis of the findings.

Self-employment as a labour option to young graduates

One of the main reasons to enrol university is to obtain a good job (Monte & Schoier, 2015). Tertiary education requires an investment of capital, usually assumed by the state and families, and individual and personal investment of time. Through education, individuals get skills to help them realize their talents (Ilie, 2014). Young people show high expectation when concluding a tertiary graduation level (Figueiredo, Biscaia, Rocha, & Teixeira, 2015), but when the transition from university-to-work fails, or does not satisfy the expectations, graduates look for alternative professional paths.

Europe recommends entrepreneurship and supports the creation and growth of small enterprises to boost employment (EU, 2015), specially wishing high-tech entrepreneurship to make regions attractive (Ciriaci & Muscio, 2014) and to promote economic development (Naudé, 2013). At the same time OECD points self-employment as a survival strategy, for those who could not find other means of earning (OECD, 2016, page 125). From the combination of the two ideas emerged some questions: “Could self-employment / entrepreneurship” save tertiary graduates from unemployment?”, “Is self-employment / entrepreneurship yet saving tertiary European graduates from unemployment?”.

The first reflection should focus on concepts: self-employment and entrepreneurship. Entrepreneurship appeared with Schumpeter in the sixties of XX century, as creative destruction, able to destabilize the markets and bring innovation to business (Swedberg, 2007). Nowadays entrepreneurial activity encompasses all phases of the business process, from business creation till discontinuation (Amorós & Bosma, 2013; Park, Razak, & Herrington, 2015; Singer, Amorós, & Moska, 2014), which means that the self-employed is considered an entrepreneur.

Literature distinguishes two kinds of self-employed persons: the opportunity-based, in line with Schumpeter concept, who came across opportunities and transform them into business, and the necessity-based, who could not find a job, and need a source of incomes (Baptista, Karaöz, & Mendonça, 2014; Baptista & Karaöz, 2006; Block & Wagner, 2010).

To succeed, the opportunity-base entrepreneurs use cognitive abilities (Hartog, van Praag, & van Der Sluis, 2010), personality traits (Caliendo, Fossen, & Kritikos, 2014) and human capital (Crum, Michael D; Sherony, Bruce; Rayome, 2015; De Cleyn, Braet, & Klofsten, 2014; Garcia Aracil, Mora, & Vila, 2004; Millán, Congregado, & Román, 2014). Part of human capital is obtained through formal education, namely higher education and, the other, comes from previous work experiences, social entrepreneurial environments (Cruz, Justo, & Castro, 2008), role models (Bosma, Hessels, Schutjens, van Praag, & Verheul, 2012), and culture (Minola, Criaco, & Obschonka, 2015).

The necessity-based entrepreneurs usually have low education, run smaller firms, with less pronounced growth (Poschke, 2010). They work alone and use a cost leadership strategy on business (Block, Kohn, Miller, & Ullrich, 2015).

Some literature distinguishes the solo-self-employed and the self-employed with employees (van Stel, Wennekers, & Scholman, 2014), the first in line with necessity entrepreneurs, and the second with opportunity entrepreneurs, however, despite Eurostat use this distinction, it does not discriminate the two forms on the microdata dissemination. For this motive we use, in our study, a single category of “self-employed with or without employees”.

According to the main objectives of the research, some hypotheses have been established:

H1: Country of residence affects the likelihood of self-employment on young tertiary graduates.

Prior literature suggested that self-employment is affected by cultural descriptive norms of a region (Minola et al., 2015; Stephan & Uhlaner, 2010; Stuetzer, Obschonka, Brixy, Sternberg, & Cantner, 2013), and by national cultural entrepreneurial values (Suddle, Sjoerd, & Wennekers, 2007). Some authors found evidences that country of residence can to be relevant on decision to be entrepreneur (Martínez, Mora, & Vila, 2007). Combining country of residence with its own culture, it seems important to check whether the first can affect graduates' decision to become self-employed.

H2: The education level affects the probability of self-employment on young tertiary graduates

As already been said, entrepreneurship is a European Union strategy to reduce young unemployment (EU, 2015), and when associated with high levels of human capital can assume characteristics of opportunity entrepreneurship and thus contribute positively to economic development of regions and member states. Assuming that the human capital can be provided by formal education, it seems important to analyse the impact of tertiary education level on self-employment rate.

H3: Field of study affects the likelihood of self-employment on young tertiary graduates.

Not all fields of study have the same likelihood of success. The investigation carried out by Allen et al. (2001) shows that health, engineering, business and justice, dominate the elite positions, while education, humanities, and agriculture take less emphasis and provide lower incomes. Other study suggest that health, information and technology, architecture and business are the areas with the fastest transitions to the first job (Salas-Velasco, 2007). The aim of this hypothesis is to evaluate if field of study has some effect on the likelihood of self-employment, and if so, to seek to identify the knowledge areas that privilege it.

H4: Gender affects the likelihood of self-employment on young tertiary graduates.

One issue discussed about self-employment were differences found between male and female (Ahl, 2006; Minniti & Nardone, 2007; Shinnar, Giacomini, & Janssen, 2012). With this hypothesis it is intended to confirm or disagree with this theory.

Data and Methodology

1.1. Database

This paper uses microdata provided by Eurostat, "European Labour Force Survey" (EU-LFS) 2013. The study was developed with a sample of 214674 tertiary graduates, from the 28 EU member states, aged between 20 and 34 years. General sample description is presented on Table 1.

Table 1. General sample description (age, sex, country of residence)

	N=214674	Percentage
Age		
20-24	36792	17.1%
25-29	84877	39.6%
30-34	93005	43.3%
Sex		
Male	88677	41.3%
Female	125997	58.7%
Country of residence		
Austria (AT)	5486	2.6%
Belgium (BE)	6571	3.1%
Bulgari (BG)	932	0.4%

	N=214674	Percentage
Check Republic (CZ)	1579	0.7%
Croatia (HR)	10678	5.0%
Cyprus (CY)	3956	1.8%
Denmark (DK)	5681	2.6%
Finland (FI)	6345	3.0%
France (FR)	2243	1.0%
Germany (DE)	18621	8.7%
Greece (GR)	27082	12.6%
Hungary (HU)	1086	0.5%
Ireland (IE)	8644	4.0%
Italy (IT)	16364	7.6%
Latvia (LV)	922	0.4%
Lithuania (LT)	14822	6.9%
Luxemburg (LU)	3123	1.5%
Malta (MT)	1725	0.8%
Netherland (NL)	1282	0.6%
Poland (PL)	4845	2.3%
Portugal (PT)	23791	11.1%
Romania (RO)	5552	2.6%
Slovakia (SK)	3214	1.5%
Slovenia (SI)	21611	10.1%
Spain (ES)	1358	0.6%
Sweden (SE)	7376	3.4%
United Kingdom (UK)	4565	2.1%

Source: EUROSTAT – LFS 2013. Own elaboration

The education sample description (see Table 2) includes the highest level of education or training successfully completed, according to International Standard Classification of Education (ISCED) codes from 1998, as well as field of study, defined by 1st digit code of ISCED Fields of Education and Training (ISCED-F 2013). Most respondents (75.7%) have a 5a level of tertiary education, while less than 2% concluded level 6. Level 5b has 22.6% of the sample. Social sciences business and law highlights in field of study (34.3%), followed by engineering 15.2%, and by health and welfare (12.5%).

Table 2. Education sample description (degree, field of study)

	N=214674	Percentage
Level		
5b	48515	22.6%
5a	162604	75.7%
6	3555	1.7%
Field of study		
General	333	0.2%

	N=214674	Percentage
Education	18928	8.8%
Arts and Humanities	20552	9.6%
Social Sciences Business and Law	73561	34.3%
Sciences	19686	9.2%
Engineering	32569	15.2%
Agriculture Veterinary	4312	2.0%
Health and welfare	26876	12.5%
Services	12119	5.6%
Unknown	2730	1.3%
No answer	3008	1.4%

Source: EUROSTAT – LFS 2013. Own elaboration

The work sample description (see Table 3) includes the work status defined by International Labour Organization (ILO), and occupation described by major groups of International Standard Classification of Occupations, 2008 (ISCO-08). The sample has 6.2% of self-employed (with or without employees), and 68.9% of employees. The main occupation is professional (34.4%) and the second (15.8%) is technician. Only 4.0% of the individuals are managers.

Table 3. Work sample description (work status, occupation)

	N=214674	Percentage
Work Status		
self-employed	13351	6.2%
Employee	147888	68.9%
family worker	882	0.4%
Unemployed	19875	9.3%
Inactive	32659	15.2%
military service	8	0.0%
no answer	11	0.0%
Occupation		
Armed Forces	1177	0.5%
Managers	8591	4.0%
Professionals	73923	34.4%
Technicians	33857	15.8%
Clerical Support	15236	7.1%
Services & Sales	17398	8.1%
Agriculture Fishery Forestry	1622	0.8%
Craft	3904	1.8%
Operators	2363	1.1%
Elementary occupations	2932	1.4%
No answer	53671	25.0%

Source: EUROSTAT – LFS 2013. Own elaboration

1.2. Methodology

The data were analysed with SPSS version 23. The self-employment models were developed by binary logistic regression, which estimates the probability of having a success, based on values of explanatory variables (Marôco, 2010).

$$P (y_i=1 | x_1, x_2, x_3, x_4, \dots, x_k) = \hat{\pi} (\beta_0 + \beta_1 x_1 + \dots + \beta_k x_k)$$

$\hat{\pi}$ is a function that takes on any value in the range [0, 1]. The logit function to k independent variables can be obtained by:

$$\hat{\pi}_i = \exp (i) / [1 + \exp (i)] = \frac{e^{\beta_0 + \beta_1 x_{1i} + \dots + \beta_k x_{ki}}}{1 + e^{\beta_0 + \beta_1 x_{1i} + \dots + \beta_k x_{ki}}}$$

Representing the same expression in its matrix form:

$$\hat{\pi} = \frac{e^{X\beta}}{1 + e^{X\beta}}$$

$\hat{\pi}$ is the vector of estimated probabilities, X is the matrix of independent variables and β are logistic regression coefficients.

Linearizing function:

$$\text{Logit} (\hat{\pi}_i) = \text{Ln} \left(\frac{\hat{\pi}}{1 - \hat{\pi}} \right) = \beta_0 + \beta_1 x_{1i} + \dots + \beta_k x_{ki}$$

Each β corresponds to a logistic regression coefficient of an independent variable "x". Odds Ratio $\left(\frac{\hat{\pi}}{1 - \hat{\pi}} \right)$, called, reflects the chances of success against the odds of failure. The models fitting is measured by Hosmer and Lemeshow test (Marôco, 2010).

2. RESULTS

This section provides the most relevant results obtained by estimating the probability of being self-employed to young tertiary graduates, and to young tertiary graduation managers.

2.1. Model 1

Self-employment rate = f (country, education level, field of study, gender)

The model with the four dependent variables did not fit to data ($\chi^2 (8) = 98,833$; p-value=0,000), which, itself is an important result, as it reveals that the self-employment rate of young graduates cannot be explained by tertiary education level, nor by field of study chosen. In the specific case of the tertiary education level, the outcome points that choosing a 5a or a 6 level, relatively to reference 5b level, does not affect the rate of self-employment. This suggests that policy incentives to obtain a higher tertiary level (5a or 6) will not promote the growth of self-employment.

The second finding is that self-employment does not depend of specific fields of study nor knowledge areas, i.e. encourage the choice of "engineering" or "social sciences, business and

justice”, will not increase self-employment, as supporting “arts and humanities” will not contribute to its decrease.

As the model with the four dependent variables did not fit to data, we tried a new one, with a single dependent variable: country of residence.

Self-employment rate = f (country)

The coefficients of the adjusted model 1 are shown in Table 4.

Table 4. Coefficients of Model 1

Variables	B	Std Error	χ^2 Wald	Sig	Exp B
Country (UK)			4561.415	0.000	
Country (AT)	0.215	0.079	7.468	0.006	1.240
Country (BE)	0.369	0.076	23.764	0.000	1.446
Country (BG)	-0.359	0.181	3.933	0.047	0.699
Country (CY)	0.564	0.110	26.111	0.000	1.758
Country (CZ)	0.362	0.086	17.749	0.000	1.436
Country (DE)	.	.	.	.	.
Country (DK)	-0.906	0.104	75.278	0.000	0.404
Country (EE)	.	.	.	.	.
Country (ES)	.	.	.	.	.
Country (FI)	-0.270	0.119	5.166	0.023	0.764
Country (FR)	.	.	.	.	.
Country (GR)	1.096	0.068	263.662	0.000	2.993
Country (HR)	.	.	.	.	.
Country (HU)	-0.237	0.080	8.759	0.003	0.789
Country (IE)	-0.331	0.071	21.716	0.000	0.718
Country (IT)	1.493	0.064	539.871	0.000	4.450
Country (LT)	-0.258	0.103	6.244	0.012	0.773
Country (LU)	.	.	.	.	.
Country (LV)	.	.	.	.	.
Country (MT)	-0.314	0.146	4.612	0.032	0.731
Country (NL)	.	.	.	.	.
Country (PL)	0.431	0.064	45.261	0.000	1.539
Country (PT)	.	.	.	.	.
Country (RO)	-0.441	0.087	25.415	0.000	0.644
Country (SE)	-0.673	0.071	89.846	0.000	0.510
Country (SI)	0.217	0.094	5.345	0.021	1.242
Country (SK)	0.486	0.083	34.023	0.000	1.626
Constant	-2.578	0.059	1909.208	0.000	0.076

Source: EUROSTAT – LFS 2013. Own elaboration

According to Hosmer and Lemeshow test (Marôco, 2010) this new model fit to data ($\chi^2(7) = 0,000$; $p\text{-value}=1,000$), however “country of residence” shows a weak discriminant power, with an area under ROC curve of 0,652 (CI 95%: [0,647; 0,657]), a specificity of 100%, but a sensibility of 0% (Marôco, 2010), which means that the model does not contribute to the identification of the self-employed individuals.

Nonetheless B values give valuable information. Using UK as reference, the outcomes suggest that some countries of residence do not produce any effect on the likelihood of self-employment: Germany, Estonia, Spain, France, Croatia, Luxembourg, Latvia, Netherlands and Portugal. On the other hand, the likelihood is reduced for those who live in Hungary (21.1%), Lithuania (22.7%), Finland (23.6%), Malta (26.9%), Ireland (28.2%), Bulgaria (30.1%), Romania (35.6%), Sweden (49%) and Denmark (59.6%), and rises for those who live in Austria (24.0%), Slovenia (24.2%), Czech Republic (43.6%), Belgium (44.6%), Poland (53.9%), Slovakia (62.6%), Cyprus (75.8%), Greece (199.3%) and Italy (345.0%).

The highlight goes to Greece and Italy, both with values above 100.0%, showing the huge importance of self-employment to young tertiary graduates who live on these countries. The differences found among member states are in line with prior literature that suggests that national culture is an important regulator of self-employment motivation and entrepreneurship (Autio, Pathak, & Wennberg, 2013; Minola et al., 2015).

2.2. Model 2

Model 2 is developed exclusively to managers, who, according to previous literature, are directed to opportunity entrepreneurship, due to their individual initiative (Wennekers et al., 2010).

Self-employment rate (managers) = $f(\text{country, gender})$

The coefficients of the adjusted model 2 are shown in *Table 5*

Table 5. Coefficients of Model 2

Variable	B	Std Error	χ^2 Wald	Sig	Exp(B)
Country (UK)	.	.	742.381	0.000	.
Country (AT)	.	.	.	.	.
Country (BE)	0.522	0.225	5.373	0.020	1.686
Country (BG)	.	.	.	.	.
Country (CY)	.	.	.	.	.
Country (CZ)	.	.	.	.	.
Country (DE)	.	.	.	.	.
Country (DK)	.	.	.	.	.
Country (EE)	1.437	0.283	25.819	0.000	4.209
Country (ES)	1.267	0.285	19.709	0.000	3.549
Country (FI)	.	.	.	.	.
Country (FR)	-0.566	0.210	7.284	0.007	0.568

Variable	B	Std Error	χ^2 Wald	Sig	Exp(B)
Country (GR)	3.095	0.237	171.221	0.000	22.085
Country (HR)	2.188	0.508	18.541	0.000	8.917
Country (HU)	.	.	.	.	.
Country (IE)	0.419	0.210	4.000	0.045	1.521
Country (IT)	2.843	0.263	116.491	0.000	17.165
Country (LT)	.	.	.	.	.
Country (LU)	.	.	.	.	.
Country (LV)	1.470	0.246	35.636	0.000	4.351
Country (MT)	.	.	.	.	.
Country (NL)	.	.	.	.	.
Country (PL)	0.607	0.197	9.504	0.002	1.834
Country (PT)	1.041	0.249	17.441	0.000	2.832
Country (RO)	1.103	0.232	22.662	0.000	3.014
Country (SE)	.	.	.	.	.
Country (SI)	1.319	0.243	29.375	0.000	3.741
Country (SK)	0.678	0.247	7.560	0.006	1.970
Gender (Fem)	-0.482	0.067	52.295	0.000	0.617
Constant	-2.001	0.183	119.907	0.000	0.135

Source: EUROSTAT – LFS 2013. Own elaboration

The adjusted model has showed an acceptable discriminating power with a ROC=0,724 (CI 95%: [0,709; 0,739]), a specificity of 98.5% and a sensitivity of 17.7% (Marôco, 2010), i.e. the model facilitates the identification of some, although few, self-employed managers.

As happened in model 1, we found differences among member states, with Italy and Greece showing the highest values of self-employed managers and, once more, suggesting that entrepreneurial culture is very pronounced in these countries. The values of United Kingdom, Austria, Bulgaria, Czech Republic, Cyprus, Germany, Denmark, Finland, Hungary, Lithuania, Luxembourg, Malta, Netherlands and Sweden are very close to each other. France is the only to show a reduced likelihood.

We have also found an important distinction among gender: comparing to male, to be a female decreases the likelihood of a manager be entrepreneur in about 40%. The outcomes are in line with other studies (Cruz, Justo, & Castro, 2008; Justo, Cruz, Castro, & Coduras, 2006; Justo & De Tienne, 2008; Noseleit, 2014; Sevä, Vinberg, Nordenmark, & Strandh, 2016) and are a consequence of being mums and need to support their child (Noseleit, 2014; OECD, 2016).

3. CONCLUSION

The aim of this study was to shed light on the influence that country of residence, level of education, field of study and sex, can have on self-employment of young tertiary graduates, and of managers with tertiary education. This is important because European Union

recommends entrepreneurship and supports the creation and growth of small enterprises to boost employment (EU, 2015).

Several important conclusions emerged from this study. First, the likelihood of self-employment of young tertiary graduates, cannot be explained by academic level, nor by field of study, which suggests that policy incentives to reach a higher tertiary education level (5a or 6) will not contribute neither to self-employment nor to entrepreneurship promotion. This finding may have two explanations: individuals who reach a master or a PhD, can be more able, or willing, to embrace a research career or an academic career, and they do not think embark in self-employment; or the self-employed are focus on business opportunities, and don't have researcher's souls.

According to some authors, self-employment can be a feasible option for those with lower levels of human capital (Crum, Michael D; Sherony, Bruce; Rayome, 2015) and cannot be an alternative to boost employment of tertiary graduates. Therefore it could contribute to job growth, but not to economic development (Naudé, 2013).

Second, the likelihood of self-employment is not affected by field of study chosen by undergraduate, which means that all knowledge areas allow independent work. In our opinion this information is helpful but not as much as it could be if data from "Social sciences, business and law" were divided in three categories. I fact is was very important to dedicate a special attention to business.

Third, there are significant differences in self-employment among member states, which is in line with previous studies (Martínez et al., 2007). It was found that living in Italy and Greece increases strongly the likelihood of being self-employed, and moderately in Cyprus, Slovakia and Poland. In contrast, living in Denmark, Sweden, Romania and Bulgari affects negatively the likelihood of being self-employed. As the effect of country in the rate of self-employment, results from the contribution of formal institutions and culture (Stephan & Uhlaner, 2010), and all member states are subject to the same policies and programmes inside the union, it is very likely that the high rates in Greece and Italy may result from the tradition of autonomy and independence of its citizens (Wennekers et al., 2010).

Fourth, with respect to self-employment of managers, almost an half of the countries, have a probability close to the United Kingdom: Austria, Bulgaria, Czech Republic, Cyprus, Germany, Denmark, Finland, Hungary, Lithuania, Luxembourg, Malta, Netherlands and Sweden. France is the only to suggest a lower probability. The highest likelihoods are Italy and, specially, Greece.

Fifth, being a female decreases the likelihood of a manager be entrepreneur in about 40%, when compared to a male. Our finding is consistent with previous studies which showed that male are more likely to be self-employed (Cruz, Justo, & Castro, 2008; Justo, Cruz, Castro, & Coduras, 2006; Justo & De Tienne, 2008; Noseleit, 2014; Sevä, Vinberg, Nordenmark, & Strandh, 2016).

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