MASTER IN
FINANCE

MASTER´S FINAL WORK
DISSERTATION

THE DETERMINANTS OF REGIONAL ENTREPRENEURSHIP

LUÍS EMÍLIO NOGUEIRA RAPOSO DE MAGALHÃES

OCTOBER - 2020

MASTER IN
FINANCE

MASTER´S FINAL WORK
DISSERTATION

THE DETERMINANTS OF REGIONAL ENTREPRENEURSHIP

LUÍS EMÍLIO NOGUEIRA RAPOSO DE MAGALHÃES

SUPERVISION:
PROFESSORA DOUTORA ANA ISABEL ORTEGA VENÂNCIO

OCTOBER-2020

CDS – Partido Central Democrático e Social

INE – Statistics Portugal

Km^2 – Squared Kilometers

MFW – Master's Final Work

OLS – Ordinary Least Squares

PSD – Partido Social Democrata

TOE – Tonne of Oil Equivalent

VIF – Variance Inflation Factor

ABSTRACT

This study aims to analyse the factors contributing to the regional entrepreneurship. We consider the entrepreneurial supply factors, entrepreneurial demand factors and, political and policy factors in our analysis. The data used is from Statistics Portugal (INE) and PORDATA and we considered economic and demographic characteristics for all 278 Portuguese mainland counties for the 2012-2018 period. We developed a multiple linear regression analysis to perform our empirical procedures.

We find that regions where the population is higher, composed by a younger and high school educated people and with greater proportions of male individuals combined with an economic frame composed by smaller proportions of micro firms, have a higher firm entry rate. We have also found that regions with a lower derrama tax rate tend to have higher entrepreneurial activity. However, we found no statistical significance on a set of variables including the population density, average monthly income, unemployment rates or even the political party in control that are components of the three vectors used in our models. We also conclude that the variables do not have statistical significance when explaining the firm exit rates, even though they suggest similar direction and lower magnitude in terms of impact on the dependent variable. The results hold when analysing the net firm entry rate.

KEYWORDS: Entrepreneurship; Determinants; Regional Entrepreneurship.

JEL CODES: L26; M13; O40; R11; R12.

RESUMO

Esta dissertação procura analisar os fatores que contribuem para o empreendedorismo regional. Para tal, consideramos os fatores de oferta de empreendedores, os fatores de procura de empreendedores e os fatores políticos e institucionais. Os dados utilizados são provenientes do Instituto Nacional de Estatística (INE) e PORDATA, nos quais consideramos características económicas e demográficas de cada um dos 278 municípios de Portugal continental, durante o período de 2012-2018. Desenvolvemos três regressões multilineares para proceder à nossa análise empírica.

Determinámos que regiões com maior população, composta por indivíduos jovens e com educação, e com proporções maiores de população masculina em combinação com um tecido empresarial com uma taxa mais baixa de microempresas, têm taxas de entrada de empresas maiores. Verificámos também que, municípios com taxas de derrama mais reduzidas tem tendência a ter mais atividade empreendedora. Contudo não verificámos significância estatística num conjunto de variáveis no qual se incluí a densidade populacional, ganho médio mensal, taxa de desemprego ou partido político no poder, componentes dos três vetores dos nossos modelos. Concluímos ainda que as variáveis não apresentam significância estatística ao explicar as taxas de saída de empresas apesar de sugerirem relações na mesma direção e menor magnitude em termos de impacto na variável dependente. Os resultados mantêm-se ao analisar a taxa líquida de entrada de empresas.

PALAVRAS-CHAVE: Empreendedorismo; Determinantes; Empreendedorismo Regional.

CLASSIFICAÇÃO JEL: L26; M13; O40; R11; R12.

TABLE OF CONTENTS

LIST OF TABLES

1. Introduction

An entrepreneur is someone willing to take a monetary risk by creating a new firm to try and develop an innovative idea, product, service, or technology (Kreft & Sobel, 2003).

Entrepreneurship, as the creation of new businesses and jobs, has been seen as one of the drivers to strive economic growth (Ardagna & Lusardi, 2008) due to Entrepreneurs being recognized as one of the vectors for economic growth, thru their ability of bringing new ideas and innovation to the market (Karadeniz, 2006). This happens at a national level but also at a regional level by evolving several economic factors such as employment creation or technological development (Thurik & Carree, 2010). Moreover, entrepreneurship is one of the key determinants for present and future employment and income, and since there are so many differences at an entrepreneurial and economic level between countries and regions it is vital for policy makers to better understand the causes and consequeces of this phenomenon so they can act accordingly, and develop the local economy (GEM, 2019). Entrepreneurship has been a subject of research for a few decades now, but those studies tend to focus mainly on economic effect behind it instead of capturing the reasons associated with it. Nonetheless, there are some previous studies on the causes of entrepreneurial activity and on the importance of entrepreneurship on the economic development (Urbano et al., 2018) at national and regional levels, but also some studies trying to explain why the differences between regions are so steep regarding the entrepreneurship level within the same country (Bosma, 2013). Although some progress has been made regarding these subjects, there are still a considerable number of questions that promote researchers to work in this area.

Following what was said above, our research question is which factors determine the difference on entrepreneurship levels across counties. We took into account previous studies determining factors (Armington & Acs, 2002; Masuda,

2006; Rogalska, 2018), and used it to address the difference in entrepreneurial activity within Portugal for the time frame of 2012 to 2018.

We can distinguish between three type of determinants: the demand factors, where we evaluate how much the region looks for products, services or even technologies, i.e., how hard a region demands and promotes entrepreneurship or attracts entrepreneurs; the supply factors, analysing the amount of people available to become entrepreneurs, accepting the inherent risk of doing so; and lastly, the political and institutional factors where we try to determine whether the institutional environment and political issues promote or diminish entrepreneurial activity.

For this purpose, we are going to use data from Statistics Portugal (INE) and PORDATA on the Portuguese counties, excluding Madeira and Azores, due to the fact of being small islands with a different economical and entrepreneurial behaviour. Focusing on mainland Portugal, we will include 278 counties, defining several proxies for what has been considered the major variables influencing entrepreneurship.

We find that regions where the population is higher, composed by a younger and educated people and with greater proportions of male individuals combined with an economic frame composed by smaller proportions of micro firms, have a higher firm entry rate. We have also found that regions with a lower derrama tax rate tend to have higher entrepreneurial activity. However, we found no statistical significance on a set of variables including the population density, average monthly income, unemployment rates or even the political party in control. We also conclude that the variables do not have statistical significance when explaining the firm exit rates, even though they suggest similar direction and lower magnitude in terms of impact on the dependent variable. The results hold when analysing the net firm entry rate, evidencing that there is little, or none influence from the firms exiting.

The empirical results mirror the importance of the availability of individuals with a set of characteristics associated with entrepreneurial activity but also the economic condition and size of the firms already operating in a given region. We have also concluded that institutional factors are of major importance, since the local politicians in control have the ability and responsibility of implementing such policies that will foment the entry of new firms in the market.

The development of this study and other research in this area is of growing interest since with globalization has changed the competitive environment and therefore, it is of extreme importance to understand the needs of the economies, in terms of resource allocation, firm strategy, investment priorities and government's role in this shift (Porter et al., 2001). The changes previously mentioned combined with the constant developments in the research field, are critical in better guiding the policy makers into what needs to be done in order to achieve greater economic performances (Armington & Acs, 2002).

Our study is divided in five sections. In section two, we review the literature review, where we summarize the main conclusions, regarding the effects of entrepreneurship on the economies' development and regarding the factors that affect the entrepreneurial activities. Additionally, we will also address our theory about the research question by setting our expectations about the results. In section three we detail our data, describe our sample by sharing the characteristics of our dataset, present our variables and what effects we were trying to capture by using it and, lastly, we interpret the descriptive statistics of our data for better understand the characterization of the counties and years we are examining throughout our study. Section four reports the methodological approach, explaining the model we adopted and its composition, after this, we detail the results obtained comparing them to the previous studies. Section five concludes, presenting a reflection on the results and main conclusions taken from the study, ending with some advice for future research on similar topics.

2. Literature Review and Theory

Entrepreneurship has been a widely discussed and studied subject and there has been a considerable amount of studies on the issue, mostly focused either on the role of institutions on promoting entrepreneurship (Busenitz et al., 2000; Urbano & Alvarez, 2014) or on the effects of entrepreneurship on the economies (Wennekers & Thurik, 1999). Alongside with these two approaches a sum of publications focus on entrepreneurship across regions or countries (Armington & Acs, 2002; Masuda, 2006; Mendonça & Grimpe, 2016; Rogalska, 2018), even though, with different goals and questions at stake.

In this section we will address the importance of entrepreneurship on economies and the determinants of entrepreneurship.

2.1. The Importance of Entrepreneurship in Economies

It is unarguable that entrepreneurship plays a very important role in the economies and economic growth (Audretsch & Keilbach, 2004; Naudé, 2010; Wennekers & Thurik, 1999), but there are many differences across different countries or even regions when talking about entrepreneurship.

With increasing globalization and technological development, there has been a need for structural changes and adaptions and consequent resource relocation with entrepreneurship being one of the vehicles to do so (Wennekers & Thurik, 1999). Thus this subject has been broadly studied when it comes to developed countries, it has been less appreciated when addressing developing economies, therefore the importance and role of entrepreneurship in the economic development process is still poorly explained (Naudé, 2010).

Entrepreneurship is known by having risk associated, meaning the need for an investment with a very uncertain outcome (Acs & Armington, 2004). While the policy makers can create good entrepreneurship conditions in order to attract entrepreneurs, those condition will also provide enhancements such as

technological improvements that will have a positive impact in economic growth (Acs et al., 2007; Leitão & Rasekhi, 2013).

Moreover, keeping the focus on promoting entrepreneurship might be one of the best strategies to allow economic growth in developing countries. Besides knowledge spill overs, attracting entrepreneurs by creating the conditions to do so, entrepreneurship should help to allocate resources in a more efficient way, develop the private sector and allow the public capital to be invested in areas like education or innovation that should have a positive effect on the entrepreneurial and economic development (Acs & Virgill, 2009).

2.2. Determinants of Regional Entrepreneurship

The importance of entrepreneurial activity has been recognized by most of the policy makers, there is still a lack of understanding on one hand, how it can be promoted and on the other hand, what will be the consequences of doing so (GEM, 2019). Nonetheless, those in charge of decision making have tried to implement policies that foster firm creation but mostly focused on the financial side as lowering taxes or better conditions for new businesses to get a bank loan.

There are several factors which scholars argue that affect the creation of start-ups. Among the different determinants of entrepreneurship, e.g., Unemployment, Tax System, Interest Rate, Profitability, Demand Growth, Level of Education, Parent's Occupation, Gender, Personal Wealth, although there is not a consensus about the direction and magnitude of the effect(Masuda, 2006).

To analyse how a variable influences entrepreneurship we should consider the spatial variation of the determinants, by looking at how it differs across economies or regions (Cueto et al., 2015). It is possible to split these variables in three categories, for the sake of simplification: the demand side for the ones which influence the local economy's demand for people willing to create a new business, the supply side that refers to the factors related to the availability of entrepreneurs

in the region and, conclusively, the institutional and political environment, as the way the policy makers try to promote entrepreneurship in a given region (Johnson & Parker, 1996).

On the demand side, a higher concentration of people means more local opportunities by more demand, creating a more attractive environment for new firm births, even though, this might also be related to the supply-side because, with higher concentration of population, there should be more entrepreneurs concentrated and more and better employment opportunities should be available, according to the region's economic situation, increasing the cost of opportunity of creating a firm to an entrepreneur (Johnson & Parker, 1996; Tödtling & Wanzenböck, 2003). Moreover, urban areas tend to be where most new firms are born, since there are more customers and suppliers available (Brixy & Grotz, 2007; Tödtling & Wanzenböck, 2003).

The economic potential and growth should also drive the demand side, which allows to assess the population's demand for new services/products (Bosma & Schutjens, 2011).

In terms of supply side, unemployment has had an enormous emphasis and is said to have an impact with regional entrepreneurship because unemployed people are more open to the opportunity of starting their own business since the available job opportunity cost will be lower (Armington & Acs, 2002). Despite of this, some studies have concluded that the effect of unemployment on entrepreneurship and vice-versa, might be related to the economic cycle and that it will vary accordingly (Carmona et al., 2012; Congregado et al., 2012). Additionally, regions characterized by smaller firms and specialized on fewer goods, should have a higher ability to adapt to the demand, showing more flexibility and growth potential (Reynolds et al., 1994). Furthermore, demographic characteristics have also to be accounted in the supply side, middle aged and more educated male individuals have historically had more inclination to become self-employed and new firms will look for higher education populations (Acs & Armington, 2004;

Evans & Leighton, 1989; Tamásy, 2006). Lastly, individuals with greater wealth have higher availability of capital or even lower costs associated with debt, seen as subject of major importance, since there are costs associated with creating firms and developing innovative products or services (Reynolds et al., 1994).

Finally, regarding institutional and political environment, local authorities can promote the necessary conditions to start and develop new firms in the region (Johnson & Parker, 1996). These conditions will be an attractiveness driver for entrepreneurs since factors like bureaucracy, corruption or even employment laws and policy factors like taxation, regulatory framework and property rights will be determinant when choosing where so setup a new firm (Christy et al., 2018; Kreft & Sobel, 2003).

Thus, we expect to find a higher entrepreneurial activity across regions with a higher concentration of people while we have mentioned there is not a consensus about it. We also expect to find higher entrepreneurial activity in regions with a higher economic potential combined with an entrepreneurial fabric mainly composed by small firms. Higher unemployment rates should also be present, although previous studies have had ambiguous results since higher unemployment rate could mean weaker market opportunities (Johnson & Parker, 1996). When addressing the regional demographic characteristics, we expect to find a positive relation with regions composed by younger male people with higher education, combined with a higher availability of personal wealth. On the other hand, we expect to find policies promoting job creation such as lower tax rate, to influence firm births by generating a better environment for the firm to grow and develop and we also expect that the political environment will have an influence on our study.

3. DATA AND DESCRIPTIVE STATISTICS

3.1. Data

Our data comes from Statistics Portugal (INE) and PORDATA datasets.

INE is the entity responsible for the Portuguese statistics framed according to the guidelines of the National Statistical System and the European Statistical System and collects periodical data for several different ranges.

PORDATA is a database, developed by Fundação Francisco Manuel dos Santos the collects, organizes and shares data on the Portuguese society, using only official and certified sources for its purpose.

Both the entities named above, produce, collect, and make available for consumption data from distinct regions of the Portuguese economy and society. The datasets may contain national, regional, or county level information, made available periodically, with a differentiated set of constraints according to the subject.

3.2. Sample

From INE, we gathered the data on total and new firms established in each county on a yearly basis from 2011-2018, and we computed the rate of new firm entry. We also collected the data regarding firm's size, unemployment rates, fuel consumption, population density, total population and all the demographic data regarding the 2012-2018 period for each county.

From PORDATA we gathered data on the political and institutional variables.

We have a total of 1,946 observations for each variable, for the 7-year period at stake and for the 278 municipalities in mainland Portugal.

3.3. Descriptive Statistics

Table 1 presents the variables used in this study and Table 2 introduces our sample's descriptive statistics.

Table 1: Variables Description

VARIABLES	DESCRIPTION
FirmEntryRate	The firm entry rate is computed dividing the number of new firms during the year over the total number of firms in the previous year.
FirmExitRate	The firm exit rate is computed dividing the number of firms that exited the market during the year over the total number of firms in the previous year.
NetEntryRate	The firm net entry rate is computed by dividing the number of new firms net of the firm that exited the market over the total number of firms in the previous year
Population Density	*Population Density* is computed by the natural logarithm of the total population over the area in squared kilometers.
Population	*Population* is the natural logarithm of the total population in the county during the year.
Monthly Income	*Monthly Income* is natural logarithm of the average monthly income during the year for the county.
Unemployment	*Unemployment* is the unemployment rate for the county and year, computed by dividing the number of people registered in the job search center over the total amount of people with age between 15-64.
Micro Firms	*Micro Firms* refers to the proportion of firms in a county during the year with less than 10 employees, less than 2 million euros in sales and less than 2 million euros in total balance sheet, all three combined.

Fuel Consumption	*Fuel Consumption* is the natural logarithm of the average fuel consumption per capita of the county in during the year, measured in TOE.
High School	*High School* is the high school frequency rate in the county and year.
Colleges	*Colleges* is the natural logarithm of the number of colleges available in the county during the year.
Gender	*Gender* is the proportion of men per 100 women in the county during the year.
Age	*Age* is value of the ageing index for the county during the year. It is computed dividing the number of people with more than 65 years of age over the number of people with ages between 0-14.
Political Party	*Political Party* is a dummy variable that takes value 1 if the county is controlled by PSD or CDS political parties or 0 otherwise.
Derrama	*Derrama* is the Derrama Tax rate applied, a complementary tax applied to the profits of the firms in the county during the year. The tax rate is reviewed yearly and takes values between 0% and 1.5%.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FirmEntryRate	1946	.16	.114	.046	1.674
FirmExitRate	1946	.125	.023	.046	.263
NetEntryRate	1946	.035	.107	-.136	1.437
Population Density	1946	305.762	839.943	4	7565.4
Monthly Income	1946	895.008	163.464	673.1	2331.2
Population	1946	35579.29	57134.361	1669	542440
Unemployment	1946	.08	.025	.027	.187
Micro Firms	1946	.968	.015	.902	1
Fuel Consumption	1946	.539	1.003	0	16.54
High School	1795	.657	.213	.009	1
Colleges	1946	1.026	5.147	0	72
Gender	1946	91.428	3.428	78	112.1
Age	1946	210.659	104.705	59.7	820.5
Derrama	1946	.009	.007	0	.015

During the period in study, 2012-2018, there was, an average firm entry rate of 16% and an exit rate of 12,5% which means a net firm entry rate of 3,5% in each one of the 278 counties:
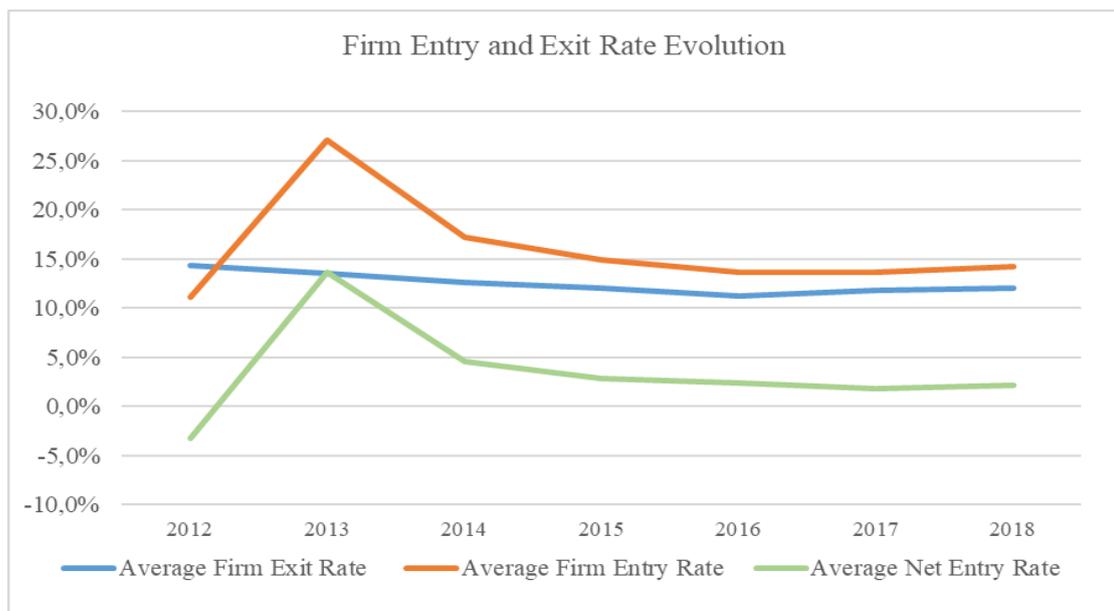
Figure 1 – Firm entry and exit rate evolution

The average population was 35579 inhabitants per county with a density of 305 people per Km^2 that earned about 895€ of monthly income. There were 91 men per 100 women amongst the population with the average age index with values of around 210. Regarding education we observe a high school frequency rate of 65.7% and about 1 college per county on average. People consumed 0.539 TOE of fuel per capita yearly and the unemployment rate was, on average, 8%:
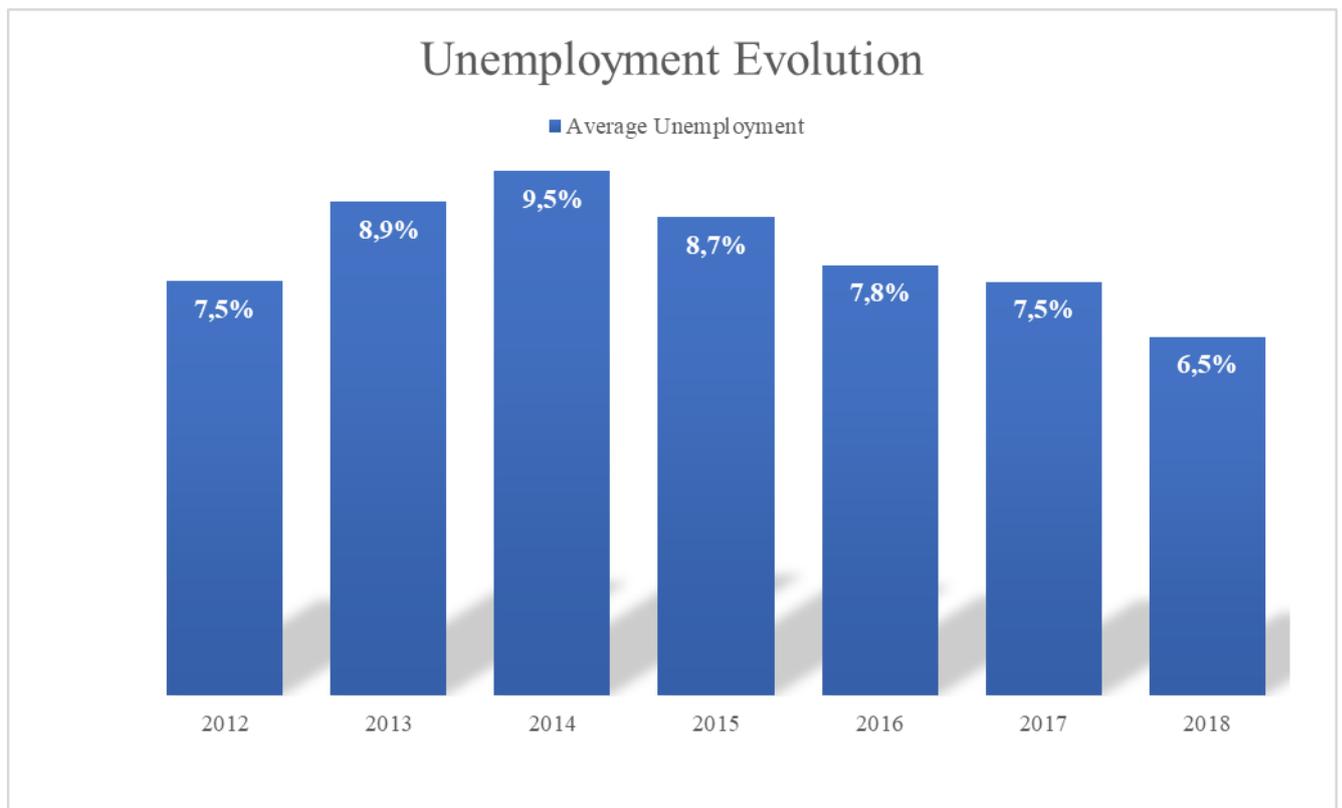
Figure 2 – Unemployment Evolution

Moreover, the firms with less than 10 employees compose, 96,8% of the total firms and counties charged an average 0,9% derrama tax, ranging from 0% to 1,5%.

4. Methodological Approach and Results

In this section we evaluate the determinants of regional entrepreneurship. To do so, we assess the influence of the demand, supply, and political and institutional factors on firm entry and on firm exit rates to determine if the factors affecting firm creation will also affect firm deaths. To exclude the effect of the firms created for temporary purposes we also analyze the net firm entry rate to see if the results hold. To conclude about the effects of the variables, we used a Multiple Linear Regression with OLS estimation method since we needed to compute the relationship between the dependent and several explanatory variables. We established the following equations:

$$E_{yc} = \beta_0 + \alpha_y + \gamma_c + \beta_1 X_{d(y-1)c} + \beta_3 Y_{s(y-1)c} + \beta_3 Z_{p(y-1)c} + \varepsilon_{yc} \qquad (1)$$

$$Ex_{yc} = \beta_0 + \alpha_y + \gamma_c + \beta_1 X_{d(y-1)c} + \beta_3 Y_{s(y-1)c} + \beta_3 Z_{p(y-1)c} + \varepsilon_{yc} \qquad (2)$$

$$NE_{yc} = \beta_0 + \alpha_y + \gamma_c + \beta_1 X_{d(y-1)c} + \beta_3 Y_{s(y-1)c} + \beta_3 Z_{p(y-1)c} + \varepsilon_{yc} \qquad (3)$$

where y denotes the year, c represents the counties analyzed, d is the demand, s the supply and p is for political and institutional factors.

Our dependent variable for model (1) is the firm entry rate during that year in each county, in model (2) use the firm exit rate, during the year in each county and in model (3) we address the net firm entry rate, to see if the results on (1) stand.

X_d is a vector that represents the demand for entrepreneurs where, according to the previous literature, we included *Population Density* to measure the concentration of people in a county, *Monthly Income,* the natural logarithm of the average monthly income of the region to account for economic development potential and we also include *Population*, the natural logarithm of the population living in the county.

Y_s represent the combination of variables included on the supply side of entrepreneurs where *Unemployment* stands for the unemployment rate on each county and year at stake, *Micro Firms* is the percentage of firms that have less than 10 employees, less than 2 million euros in sales volume and less and 2 million euros in terms of balance sheet, all three combined and, finally, *fuel consumption* which is the natural logarithm of the amount of fuel consumption per capita and will work as proxy for personal wealth, as wealthier people will, more likely, present higher consumptions. We also include the demographic characteristics of each region on the supply side, by considering education level, gender, and age. The education level was considered through *High School*, that measures the high school frequency rate and by *Colleges* that accounts for the natural logarithm of the number of colleges available in the county and works as a proxy for the amount of college educated people available. Gender is measured by the number of male individuals for 100 female individuals. Finally, age was considered by *Age*, which is the ageing index of the county.

The political and institutional factors are represented by the vector Z_p, where we have comprised *Political Party*, a dummy variable that takes value 1 if a right-wing party (PSD or CDS) is in control of the county and 0 otherwise and *Derrama*, that measures the derrama rate, a tax applied at a county level to the firm's profits.

The model also accounts for 278 counties fixed effects, γ_c, and yearly effects for the period from 2012 to 2018 to consider the macro-economic factors, α_y. All the other independent variables are all lagged by one year to control for reverse causality and the standard errors are clustered at county level.

Table 3 presents the Variance Inflation Factor (VIF), and Table 4 columns (1), (2) and (3), present the results of our multiple linear regression on the models (1), (2) and (3), respectively.

14

Table 3: Variance Inflation Factor

Variance inflation factor

	VIF
Population	2.881
Age	2.112
Monthly Income	1.879
Population Density	1.756
Colleges	1.677
Micro Firms	1.583
Gender	1.445
Derrama	1.307
Fuel Consumption	1.281
High School	1.27
Unemployment	1.145
Political Party	1.091
Mean VIF	1.619

We conducted the Variance Inflation Factor analysis to check for multicollinearity within our set of variables. The threshold considered for the analysis was a VIF value of 10. VIF values below 10 show no signs of multicollinearity and above 10 will indicated the presence of multicollinearity. Our average value for our variables was 1.62 with a maximum of 2.88, so we concluded no multicollinearity was present in our set of determinants.

Table 4: Results

VARIABLES	(1) FirmEntryRate	(2) FirmExitRate	(3) NetEntryRate
Population Density	-2.50e-05	-5.65e-06	-1.94e-05
	(2.36e-05)	(4.58e-06)	(2.14e-05)
Monthly Income	-0.118	0.00963	-0.128*
	(0.0824)	(0.0188)	(0.0739)
Population	0.484***	-0.0389	0.523***
	(0.155)	(0.0406)	(0.130)
Unemployment	-0.341	-0.0501	-0.291
	(0.228)	(0.0375)	(0.208)
Micro Firms	-9.272***	-1.159***	-8.113***
	(1.503)	(0.249)	(1.330)

15

Fuel Consumption	-0.0335*	-0.00268	-0.0308*
	(0.0200)	(0.00298)	(0.0181)
High School	0.120**	0.0139*	0.106**
	(0.0508)	(0.00838)	(0.0464)
Colleges	0.0310	0.00588	0.0251
	(0.0247)	(0.00432)	(0.0216)
Gender	0.0134**	0.00172	0.0117**
	(0.00564)	(0.00122)	(0.00478)
Age	-0.000977**	-1.63e-05	-0.000960**
	(0.000449)	(8.96e-05)	(0.000393)
Political Party	-0.0192	-0.00134	-0.0179
	(0.0151)	(0.00272)	(0.0130)
Derrama	-2.124**	0.181	-2.304**
	(1.074)	(0.229)	(1.066)
Constant	3.769*	1.424***	2.346
	(2.183)	(0.523)	(1.903)
Observations	1,79	1,79	1,79
R-squared	0.391	0.570	0.407

Note: The table presents the results of equation (1), (2) and (3). The county and year fixed effects are considered but not reported. Standard errors clustered at county level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Model (1) presents a R^2 of 0.391, meaning the independent variables explain 39.1% of the variance of our dependent variable, firm entry rate. Model (2) presents R^2 of 0.570 and model (3) a R^2 0.407. These results are not surprising, since firm entry and exit are conditioned by several human factors that are hard to reproduce in a model.

We have considered the 0.05 threshold in terms of p-value when evaluating the significance of the variables, meaning that, if a variable presents a p-value over 0.05, we will take it as non-statistically significant.

Analyzing model (1) results, on the demand side we find that *Monthly Income* presents a negative coefficient, evidencing the firm entry rate will increase in counties where the average monthly income is lower, as expected, but we cannot conclude about it since it shows no statistical significance. *Population Density*

suggests a negative impact on the firm entry rate contrary to our previous presumption, although it is non-statistically significant. Despite of this, *Population* presents a positive relation with the dependent variable, suggesting highly populated places will have higher firm entry rates.

Looking at the supply side, we find that *Unemployment, Fuel Consumption* and *Micro Firms* present negative coefficients, and although the first two show no statistical significance, we conclude that areas where there is a lower proportion of micro firms tend to have a lower firm birth rate. Moreover, *High School* and *Colleges* both have a positive coefficient with *High School* presenting statistical significance supporting the importance of educated people available to promote firm creation. *Gender* and *Age* are statistically significant, and we conclude that a younger population with a higher male proportion should increase the firm entry rate.

Finally, addressing the political and institutional factors, we cannot conclude about *Political Party* since there is no statistical significance although it presents a negative coefficient. On the other hand, we conclude that counties with lower Derrama Tax rates will have higher firm birth rates, as we expected, since lower tax rates mean reduced entry barriers for firms, emphasizing the importance of the political and institutional environment on entrepreneurial activity.

On Firm Exit rate, model (2) analysis, we find that all variables are not statistically significant with exception of *Micro Firms* that has a negative influence. Despite most of the relations holding when comparing to model (1) it presents a decrease in magnitude with lower coefficients. As presumable, *Monthly Income* and *Derrama* present positive influence, suggesting that higher average incomes and higher taxes will increase the firm exit rates by increasing the opportunity cost of maintaining a firm. We conclude that factors affecting firm entry rate have a less strong impact on firm exit, although the direction of such impact should be similar.

17

Model (3) intended to check if the behavior of these variables on firm entry rate would be the same with the presence of the firm exit rate effects. We find the results hold. All coefficients present the same sign, evidencing the same direction and magnitude of the effects. *Population*, *Micro Firms, High School*, *Gender*, *Age* and *Derrama* maintain the statistical significance. We confirm the results of model (1), where counties with more population, with an economical tissue with less micro firms and where there are higher proportions of educated young male individuals combined with favorable policy implementations by the political and institutional have a higher net firm entry rate.

5. CONCLUSION

The aim of our study was to increase the knowledge about the factors that conduct entrepreneurship across regions. To do so, we have considered several variables, divided in three major categories: entrepreneurial supply, entrepreneurial demand, and politics and policy characteristics.

The sample studied is composed by a total 1,946 observations of each variable, across the 278 counties that compose the Portuguese mainland for the time frame of 2012-2018.

We collected data from INE and PORDATA, two statistical entities in Portugal, and used the created dataset to develop a Multiple Linear Regression, to assess the relationship and statistical significance of the explanatory variables with firm births.

We found that counties with more population, lower age index values, with higher concentrations of high school educated male individuals with an economical tissue with fewer firms with less than 10 employees and with a lower derrama tax rate tend to have a higher firm creation rate and that these results hold for net firm entry rate, meaning the firm exit effect does not have a significant weight on the firm entry rate. Although most of the results go according to what we expected, population density, the micro firms' proportion and unemployment had an inverse relationship with firm creation, prior to what we set as expectation. Nonetheless this effect could be explained by the deterioration of the economic opportunities in regions where unemployment is higher. And so, we would suggest policy makers to adopt measures that would promote young, educated people to move to areas with higher age indexes and where education level is lower, starting with creating the proper institutional environment, to potentialize the local economy and reduce the unemployment by creating more opportunities for new firms to be born.

Summing up, micro firms' proportion, high school frequency, male proportion, ageing index and total population all presented statistical significance. On the other hand, the population density, monthly income, unemployment rate, fuel consumption per capita, number of colleges outstanding and political party in control appear to be non-statistically significant.

With the results presented on the previous paragraphs, we observed that not only the demand and supply sides presented statistical significance but also the political and institutional environment and so we determined the importance of these determinants on entrepreneurial activity.

We should consider this study also has some limitations. The time frame of the available data (2012-2018) only comprises 7 years that could not be enough to study such a complex topic and entrepreneurship is very difficult to measure and evaluate, thus, we tried to proxy it with firm creation.

For future research it would be interesting to consider other factors as possible determinants of entrepreneurship, especially on the supply side, as well as considering a more detailed entrepreneurship proxy, both for longer periods.

6. References

Acs, Z. J., & Armington, C. (2004). Employment growth and entrepreneurial activity in cities. *Regional Studies*, *38*(8), 911–927. https://doi.org/10.1080/0034340042000280938

Acs, Z. J., Brooksbank, D. J., O'Gorman, C., Pickernell, D. G., & Terjesen, S. (2007). Knowledge Spillover Theory of Entrepreneurship and FDI. *Jena Economic Research Papers*, *2007,059*.

Acs, Z. J., & Virgill, N. (2009). Handbook of Entrepreneurship Research. In *JENA ECONOMIC RESEARCH PAPERS* (Issues 2009 – 023). https://doi.org/10.1007/978-1-4419-1191-9

Ardagna, S., & Lusardi, A. (2008). Explaining International Differences in Entrepreneurship: The Role of Individual Characteristics and Regulatory Constraints. *NBER WORKING PAPER SERIES EXPLAINING*, *14012*. http://www.nber.org/papers/w14012

Armington, C., & Acs, Z. J. (2002). The determinants of regional variation in new firm formation. *Regional Studies*, *36*(1), 33–45. https://doi.org/10.1080/00343400120099843

Audretsch, D. B., & Keilbach, M. (2004). Entrepreneurship capital and economic performance. *Regional Studies*, *38*(8), 949–959. https://doi.org/10.1080/0034340042000280956

Bosma, N. (2013). The Global Entrepreneurship Monitor (GEM) and its impact on entrepreneurship research. *Foundations and Trends in Entrepreneurship*, *9*(2), 143–248. https://doi.org/10.1561/0300000033

Bosma, N., & Schutjens, V. (2011). Understanding regional variation in entrepreneurial activity and entrepreneurial attitude in Europe. *Annals of Regional Science*, *47*(3), 711–742. https://doi.org/10.1007/s00168-010-0375-7

Brixy, U., & Grotz, R. (2007). Regional patterns and determinants of birth and survival of new firms in Western Germany. *Entrepreneurship and Regional Development*, *19*(4), 293–312. https://doi.org/10.1080/08985620701275510

Busenitz, L. W., Gómez, C., & Spencer, J. W. (2000). Country Institutional Profiles: Unlocking Entrepreneurial Phenomena Author(s): *The Academy of Management Journal*, *43*(5), 994–1003.

Carmona, M., Congregado, E., & Golpe, A. A. (2012). Comovement between self-employment and macroeconomic variables: Evidence from spain. *SAGE Open*, *2*(2), 1–7. https://doi.org/10.1177/2158244012448665

Christy, Z. T., Murat, A., & Jiya, N. S. (2018). Effect of Political Environment on Entrepreneurship Development: A Small Business Perspective in Abuja, FCT. *International Journal of Operational Research in Management, Social Sciences & Education*, *4*(2).

Congregado, E., Golpe, A., & van Stel, A. (2012). The "recession-push" hypothesis reconsidered. *International Entrepreneurship and Management Journal*, *8*(3), 325–342. https://doi.org/10.1007/s11365-011-0176-1

Cueto, B., Mayor, M., & Suárez, P. (2015). Entrepreneurship and unemployment in Spain: a regional analysis. *Applied Economics Letters*, *22*(15), 1230–1235. https://doi.org/10.1080/13504851.2015.1021450

Evans, D. S., & Leighton, L. S. (1989). The determinants of changes in U.S. self-employment, 1968-1987. *Small Business Economics*, *1*(2), 111–119. https://doi.org/10.1007/BF00398629

GEM. (2019). GEM 2019/2020. In *Экономическая Социология* (Vol. 8, Issue 2).

Johnson, P., & Parker, S. (1996). Spatial variations in the determinants and effects of firm births and deaths. *Regional Studies*, *30*(7), 679–688. https://doi.org/10.1080/00343409612331349968

Karadeniz, E. (2006). *Entrepreneurship and Economic Development*.

Kreft, S. F., & Sobel, R. S. (2003). *Entrepreneurship, economic growth and public policy*. https://doi.org/10.1007/s11187-006-9012-3

Leitão, N. C., & Rasekhi, S. (2013). The impact of foreign direct investment on economic growth: the Portuguese experience. *Theoretical and Applied Economics*, *XX*(1), 51–62.

Masuda, T. (2006). The determinants of latent entrepreneurship in Japan. *Small Business Economics*, *26*(3), 227–240. https://doi.org/10.1007/s11187-005-0206-x

Mendonça, J., & Grimpe, C. (2016). Skills and regional entrepreneurship capital formation: a comparison between Germany and Portugal. *Journal of Technology Transfer*, *41*(6), 1440–1456. https://doi.org/10.1007/s10961-015-9444-5

Naudé, W. (2010). Entrepreneurship, developing countries, and development economics: New approaches and insights. *Small Business Economics*, *34*(1), 1–12. https://doi.org/10.1007/s11187-009-9198-2

Porter, M. E., Sachs, J., & McArthur, J. (2001). Executive summary: Competitiveness and stages of economic development. *The Global Competitiveness Report*, *2002*, 16–25. https://doi.org/10.1002/yd.370

Reynolds, P., Storey, D. J., & Westhead, P. (1994). Regional variations in new firm formation. *Regional Studies*, *28*(4), 343–456.

Rogalska, E. (2018). Multiple-criteria analysis of regional entrepreneurship conditions in Poland. *Equilibrium*, *13*(4), 707–723. https://doi.org/10.24136/eq.2018.034

Tamásy, C. (2006). Determinants of regional entrepreneurship dynamics in contemporary Germany: A conceptual and empirical analysis. *Regional Studies*, *40*(4), 365–384. https://doi.org/10.1080/00343400600612137

Thurik, R., & A. Carree, M. (2010). The Impact of Entrepreneurship on Economic Growth. *Handbook of Entrepreneurship Research*, *June 2010*. https://doi.org/10.1007/978-1-4419-1191-9

Tödtling, F., & Wanzenböck, H. (2003). Regional differences in structural characteristics of start-ups. *Entrepreneurship and Regional Development*, *15*(4), 351–370. https://doi.org/10.1080/0898562032000058923

Urbano, D., & Alvarez, C. (2014). Institutional dimensions and entrepreneurial activity: An international study. *Small Business Economics*, *42*(4), 703–716. https://doi.org/10.1007/s11187-013-9523-7

Urbano, D., Aparicio, S., & Audretsch, D. (2018). Twenty-five years of research on institutions, entrepreneurship, and economic growth: what has been learned? *Small*

Business Economics, *53*(1), 21–49. https://doi.org/10.1007/s11187-018-0038-0

Wennekers,   S.,   &   Thurik,   R.   (1999).   Wennekers-Thurik1999_Article_LinkingEntrepreneurshipAndEcon.   *Small   Business   Administration, Washington*, *13*, 27–55.

7. APPENDIX

Table 5: Correlation Matrix

Matrix of correlations

Variables	Population Density	Monthly Income	Population	Unemployment	Micro Firms	Fuel Consumption	High School	Colleges	Gender	Age	Political Party	Derrama
Population Density	1.000											
Monthly Income	0.438	1.000										
Population	0.543	0.501	1.000									
Unemployment	0.086	-0.146	0.050	1.000								
Micro Firms	-0.164	-0.202	-0.460	0.061	1.000							
Fuel Consumption	0.020	0.336	0.206	-0.105	-0.242	1.000						
High School	0.127	0.195	0.320	0.045	-0.128	0.161	1.000					
Colleges	0.436	0.391	0.534	0.065	-0.113	0.139	0.342	1.000				
Gender	-0.233	0.001	-0.051	0.091	-0.116	0.172	-0.233	-0.232	1.000			
Age	-0.232	-0.359	-0.581	-0.123	0.517	-0.132	-0.125	-0.172	-0.270	1.000		
Political Party	-0.073	-0.140	-0.008	-0.023	-0.078	-0.020	0.026	-0.005	-0.183	0.078	1.000	
Derrama	0.196	0.411	0.366	-0.019	-0.228	0.194	0.119	0.166	0.117	-0.347	-0.097	1.000