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Working Paper

The entrepreneurial context, a factor of Economic Growth in the Europe Union? A GWR analysis on the EU Regions

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THE ENTREPRENEURIAL CONTEXT, A FACTOR OF ECONOMIC GROWTH IN THE EUROPEAN UNION? A GWR ANALYSIS ON THE EU REGIONS

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Abstract: Recently the literature has paid more attention to the entrepreneurial environment, to explain the role of entrepreneurship in the economic development. However nowadays very little empirical contributions demonstrate that the entrepreneurial environment really counts (Acs et al., 2014; Szerb et al., 2015; Acs et al., 2017) in promoting quality entrepreneurship. By using the GWR, we explored the spatial heterogeneity of the role of entrepreneurial context to explain differences in levels of regional development. In our study, the entrepreneurial environment is measured by the Regional Entrepreneurship and Development Index (REDI) for the EU regions. The results show that the entrepreneurial environment on the level of regional development suggests some positive or negative impact, depending on the location of the regions.

Keywords: entrepreneurship, regional development, GWR, European Union

JEL Classification: C21, C26, R58

1- Introduction

The recent economic and financial crisis in the European Union (EU) has had an asymmetrical impact on the regions (Gorzelak, 2017) and highlighted the greater or lesser resilience of the territories (Capello et al., 2015; Dijkstra et al., 2015). The state of the European financial system remains fragile, public finances have been hit hard with debt levels exceeding 80% of GDP in 2009, budget deficits averaging 7%, industrial production falling to the levels of the 1990s and 10% of the EU's workforce is unemployed (European Commission 2010).

It is within this framework that the Commission has decided to make every effort to revive growth and meet the challenge of competitiveness and employment. In particular, the European Investment Bank has decided to revitalize the economy of the “Old Continent”. It is responsible for steering the implementation of the Juncker plan by 315 billion euros, 1/4 of which is foreseen for European SMEs and start-ups. In particular, entrepreneurs can count on the European Investment Fund (EIF), the Competitiveness of Enterprises and Small and Medium-Sized Enterprises (COSME) program and the Horizon 2020 (European Commission, 2015). This policy, inspired by the Small Business Act (2008) and reaffirmed in the "Entrepreneurship 2020 Action Plan", is all the more justified given that SMEs are considered to be the main source of employment, adapt more easily to rapid changes in domestic and foreign demand, account for a large share of innovation activity in the EU and are therefore essential for improving the competitiveness of the European economy (Urbaniec, 2015), especially in the peripheral regions of the EU (Baumgartner et al., 2013).

Emerging from an economic crisis, ensuring a regulatory, legal and financial framework conducive to entrepreneurship becomes a priority for the European Union. It is in this sense that the Europe 2020 strategy has initiated policies capable of supporting the main engines of European development, such as: industrial policy, research, innovation, energy policy and social protection policies. To these vertical policies have been added horizontal policies mainly aimed at creating employment and fostering entrepreneurship. This implies the creation of economic and social conditions and reforms specific to companies, presented by the European Commission as key players in building a smart, sustainable and inclusive economy with employment, productivity and social cohesion.

Therefore, looking at the links between economic growth and entrepreneurship seems to be relevant. This relationship raises questions about whether the European Commission should rely on companies to boost growth in Europe. This question is all the more important given the European Commission's overall objective of reducing regional disparities in Europe (Barca, 2009; Manzella and Mendez, 2009; McCann and Ortega-Argilés, 2015). Whereas

before the objective was to increase investment and employment in the backward regions, the new objective is to increase the territorial competitiveness of all regions (Capello et al, 2008; Camagni and Capello, 2010; Gordon, 2011). This place-based policy (Bachtler, 2010), drawn from theories of endogenous growth, is therefore to focus on local development potentials, in which entrepreneurship is paramount.

The entrepreneur is seen as an important driver of economic development, employment and productivity growth (Wennekers et al., 2005). According to Feldman (2001) and Audretsch and Fritsch (2002), the most appropriate dimension for studying entrepreneurship is the regional dimension. Indeed, the *Knowledge Spillover Theory of Entrepreneurship* (Acs et al., 2009) highlights the importance of the local mix of entrepreneurs and knowledge mainly disseminated by research centers and universities. Many works now incorporate an entrepreneurial variable in the orthodox regional theory of growth or consider the importance of studying entrepreneurship and its consequences at the regional level (Audrestch and Fritsch, 2002 ; Van Stel and Storey, 2004 ; Fritsch and Mueller, 2004 ; Audretsch and Keilbach, 2004 ; Audretsch and Keilbach, 2005 ; Fritsch, 2008 ; Sternberg, 2009 ; Acs, 2010 ; Cooke et al., 2011 ; Fritsch and Schroeter, 2011 ; Dejardin and Fritsch, 2011 ; Fritsch and Wyrwich, 2012 ; Fritsch, 2013 ; Van Oort et Bosma, 2013 ; Abdesselam et al., 2014 ; Aubry et al., 2015 ; Hundt and Sternberg, 2016). In this literature the environment of new-firms startups conditions the scope of the creation of value. Audretsch and Fritsch (2002) determine different “entrepreneurial regimes” more or less favorable to the creation of jobs; Fritsch (2008) and Fritsch and Schroeter (2011) suggest that the influence of business creation on job creation differs between regions ; the most productive of them are the most likely to benefit from new-firms startups: by high quality entry, (Fritsch, 2008, Fritsch and Schroeter, 2011) or by entrepreneurship oriented towards exportations (González-Pernía et Peña-Legazkue, 2015). Il est également admis que l'entrepreneuriat est un phénomène complexe qui est motivé par des individus qui s'inscrivent dans un contexte économique et sociétal plus large. Or, on recense à ce jour que très peu de contributions démontrant que l'écosystème et l'environnement entrepreneurial compte (Hall and Sobel, 2008 ; Acs et al, 2014 ; Szerb et al, 2015 ; Acs et al, 2017)

In the literature, it is often mentioned that the conditions favoring new firms and growth are linked to the institutional context and the level of development (Hall and Sobel, 2008; Stenholm et al., 2013). The premises of these conclusions can be found as early as 1994 in the works of Gnyawali and Fogel, who define the dimensions of the entrepreneurial environment. It includes socio-economic factors, institutional and governmental policies and procedures, entrepreneurial and commercial skills of the project promoters, and the level of

financial assistance. Aparicio et al. (2016) find that informal factors (attitudes towards entrepreneurship, perceived corruption, confidence in one's own capacities, etc.) have a stronger impact on entrepreneurial activity than formal factors (procedures and costs for creating a business, accessing credit, etc.). Abdesselam et al. (2017) established a typology of entrepreneurship in OECD countries. They have shown that the institutional environment linked to regulation is capable of stimulating or inhibiting not only entrepreneurial activity, but also the type of entrepreneurial activity, that is, the prevalence of opportunity reasons in entrepreneurial engagement. The Global Entrepreneurship Index (GEI) and its regional declination the Regional Development Index (REDI), are relevant indicators for assessing the entrepreneurial environment on the one hand, and entrepreneurship on the other hand. They can be considered as explanatory factors for regional development in the sense that opportunistic entrepreneurship boosts regional development (Shane, 2012).

We will therefore consider the REDI in an econometric approach linking the level of development of the region and its environment more or less favorable to entrepreneurship of opportunity. The approaches developed in spatial econometrics use for the most part so-called "global" models, that is to say estimating a regression coefficient for the whole sample for the explanatory variable. However, the work of the New Geographical Economy in particular showed the presence of multiple equilibria and spatial heterogeneity of regional development. In this framework, we propose a local variation of the "classical" spatial econometric models via the geographically weighted regression (GWR) to deal with the problem of non-stationarity of regional development. The choice of this method is also motivated by the fact that, to date, we have identified less than a dozen studies using this technique, even though the research opting for this method is promising (Breitenecker and Harms, 2010). In this context, the contributions of our article are as follows. First, we will address the impact of the entrepreneurial environment on economic development at the regional level across the European Union. Then, applying GWR techniques, we answer the question of the spatial heterogeneity of the impact of the entrepreneurial context on the level of regional development. Finally, through our analysis, we propose recommendations concerning the importance of the entrepreneurial environment in order to promote entrepreneurship of opportunity, factor of regional development.

In a first section we present the theoretical and empirical foundations of the entrepreneurial environment in relation to regional growth. A second section is devoted to empirical strategy. The third section will present the main results, finally the last section will

propose a conclusion and a discussion in terms of recommendations for future European policies.

2- Theoretical and empirical foundations of the entrepreneurial environment on regional growth

2.1 Entrepreneurial motivations at the crossroads of regional development

Entrepreneurship is the result of an individual decision-making process and constitutes an important channel for the implementation of useful and valuable information in the commercialization of new ideas, products and processes (Aubry et al., 2015). According to Audretsch (2007), the most appropriate dimension for studying entrepreneurship is the regional dimension. Indeed, Acs et al. (2013) highlight the importance of the local mix of entrepreneurs and knowledge mainly disseminated by research centers and universities. "The ability to transform knowledge into economic knowledge involves not only a set of skills and insights, but also local proximity to the source of the knowledge". Indeed, many works now incorporate an entrepreneurial variable into the orthodox regional theory (Audrestch and Fritsch, 2002; Fritsch and Mueller, 2004; Fritsch, 2008; Audretsch and Keilbach, 2004; Audretsch and Keilbach, 2005; Abdesselam et al, 2014; Aubry et al., 2015).

Although business creation can always be considered "good news" in relation to the human capital of the individual, motivations have an important influence on the survival and development prospects of the firm (Bhattacharjee et al., 2006). When motivations are linked to the reduction in the opportunity cost of doing business - when the individual is in a bad position in the labor market - on average, firms have a shorter lifespan and prospects for development are less important. Oxenfeldt (1943) was the first to recognize that unemployed individuals or individuals with low wage prospects can become entrepreneurs simply to earn a living. A whole literature exists on the distinction between motivations between Push entrepreneurs who are constrained to entrepreneurship and Pull entrepreneurs who are motivated by new innovative ideas (e.g. Evans and Leighton, 1989; Storey, 1991; Acs et al., 1994) and the regional level (Tervo and Niittykangas, 1994) for Finland, Audrestch and Keilbach (2005) for the German regions, Sterlacchini (2006) for the European regions, Abdesselam et al, (2014) and Aubry et al, (2015) for the French regions.

Similar findings are found in GEM reports (2002, 2006, 2009, and 2014), which also highlight a high level of Push entrepreneurship in countries with relatively low levels of economic development. The importance of the primary sector and the functioning of the

informal economy explain the high level of entrepreneurial activity in developing countries (Szerb et al., 2013). Wennekers et al. (2010) explain that the re-emergence of independent entrepreneurship is based on at least two revolutions: autonomous self-employment (Bögenhold and Fachinger, 2008; Bögenhold et al., 2017; Fachinger and Frankus, 2017), which is important for societal reasons and flexibility, and ambitious and/or innovative entrepreneurs (Acs et al., 1999; Van Stel and Carree, 2004; Audretsch, 2007). Simon-Moya et al. (2014) argue that entrepreneurship for reasons of necessity plays a more important role in countries whose economic development is relatively weak and where inequality prevails. Conversely, in more developed countries with relatively low income inequality and low unemployment rates, entrepreneurial activity rates are lower, but firms are created more often for reasons of expediency.

2.2 The entrepreneurial environment to promote opportunities

The business creation environment takes part in the magnitude of expected value creation. Fritsch (2008) or Fritsch and Schroeter (2011) indicate that the influence of business creation on job creation differs between regions. Not only regions show entrepreneurial persistence (Fritsch and Wyrwich, 2012), but the most productive of them are the most likely to benefit most from the creation of new firms (Fritsch, 2008). Audretsch and Keilbach (2007) has defined a region's capacity to create new firms start-ups as the region's entrepreneurship capital. In the German context, they concluded that entrepreneurship capital is driven by different types of business opportunities and at the same time is locally embedded.

Consequently, the importance of the overall environment of entrepreneurship as a factor favoring regional growth is essential in the work dealing with the regional economy. Venkataraman (2004) synthesized this in what can be called the virtuous scheme of an innovation economy that opposes the vicious scheme of a managerial economy. A well-known illustration of the virtuous scheme is that of the Silicon valley. The success of this area is mainly due to the proximity of Stanford University and the communication between individuals that facilitates the transmission of knowledge among individuals, firms and localized industry (Saxenian, 2004). Gilson (1999) notes that unconstraining noncontracting clauses in California have developed an active labor market between firms in the territory according to the open innovation system (Chersbourg, 2003). The opportunities to change jobs are many and it is easy to highlight its specific experience in other companies in the territory. In an unfavorable environment, entrepreneurs are driven to rather than drawn into entrepreneurship. This is particularly evident when we look at the low entrepreneurial

intensity and the very high proportion of the unemployed among entrepreneurs in France compared to the US (Bhattacharjee et al., 2010). Only the Ile-de-France region, with a strong research presence, had a Schumpeter effect - a greater number of new businesses resulting in a lower unemployment rate - which prevailed in the long term (Aubry et al. Al., 2015).

This complex environment where multiple variables intervene reflects an entrepreneurial system more or less favorable to innovative entrepreneurship: "Although entrepreneurial action is ultimately undertaken by individuals, these individuals are always embedded in a given regional context." (REDI report, Szerb et al., 2013, p.2). We hypothesize that a favorable entrepreneurial context will lead to greater regional economic growth. As part of the Europe 2020 Economic Growth Strategy, the European Commission highlights the role of regional policy in ensuring the complementarity of EU member states at a national and regional level for research and development, innovation and entrepreneurship (REDI report, Szerb et al., 2013). With the aim of taking into account the complexity of an environment conducive to the creation of innovative enterprises in the regional context, an index - called the Regional Entrepreneurship and Development Index (hereinafter REDI) - was created to take into account the complexity of an environment conducive to the creation of innovative enterprises and to strengthen the portfolio of entrepreneurs at regional level throughout the EU. REDI is also used to identify the strengths and weaknesses of an area in order to address them. Based on a complex calculation of normalization, identical marginal effects according to the pillars and penalization of bottlenecks (i.e. the weakest pillar constrains the overall level of REDI), this global index reflects a region's ability to promote quality entrepreneurship, which is a factor of growth and job creation.

Indeed, for the promoters of REDI, an entrepreneur is a person who has the Kirznerian capacity of "alertness" in the sense that he sees an opportunity for innovation and seizes it, in other words that he leads it to the market. With this definition, many self-employed or self-entrepreneurs are not entrepreneurs in the sense that they do not bring changes in the market. According to Stam (2008), certain conditions are necessary for entrepreneurial activity: (i) the existence of entrepreneurial opportunities that may be more or less important, (ii) the existence of individuals capable of grasping them and, above all, (iii) the opportunity must be exercised in an organization and must represent a real recombination which involves a change in the market. It is therefore seen that the REDI indicator is meant to measure the conditions under which the highest quality entrepreneurial activity is possible: "A system of entrepreneurship is the dynamic, institutionally embedded interaction between entrepreneurial attitudes, ability, and aspirations, by individuals, which drives the allocation of resources through the creation and operation of new ventures. (REDI report, Szerb et al., 2013, p.12). In

their definition the authors clearly take into account the institutionalist approach. It refers to a set of political, social and legal rules that establish a basis for production, exchange and distribution in a system or society (North, 1990; Bruton and Ahlstrom, 2003). Scott (1995) distinguishes three institutional categories: regulation, normative and cognitive. North (1990) proposes to separate formal and informal institutions. Formal and informal institutions favor the creation of a business by opportunity, or constrain it (Thornton et al., 2011; Alvarez and Urbano, 2011 and 2012).

The most formal institutions are regulatory institutions, representing standards defined by laws and other sanctions (Bruton and Ahlstrom, 2003). Normative institutions are less formal and less codified and define the roles or actions that are expected by individuals. Cognitive institutions refer more to the culture, behavior and role model shared in society. For the construction of the 14 pillars, REDI uses both an individual variable (derived from the EME surveys) and an institutional variable in the same domain from various sources (see appendix).

3- Empirical strategy

3.1 Exploratory analysis: Geographically weighted regression (GWR)

When constructing a model, it is important to consider spatial heterogeneity. It is assumed that the relationships modeled vary in space. This spatial non-stationarity implies that some variables may have a positive effect in some regions, while negative effects are observable in others.

In the case of our study, we chose an essentially exploratory methodology to identify the nature and patterns of spatial heterogeneity over the entire study area. The GWR technique allows local estimation of regional development levels and a test of their spatial variability. This method is based on locally linear regressions in order to obtain estimators at each point in space. It uses sub-samples of data, made up of neighboring observations. The choice of sub-samples refers to the distances between the observations of each regression point, in this case the European regions. The estimation procedure is based on a Gaussian principle where the observations closest to the regression point have weights greater than the closest observations.

To date, studies that use this technique in research on the role of entrepreneurship in regional economic development are emerging and promising (Breitenecker and Harms, 2010). We thus find recent work using the GWR to show the spatial variations (i) of the determinants of entrepreneurship (Cheng and Li, 2011; Breitenecker, 2017), (ii) the relationship between

entrepreneurship and job creation (Shearmur, 2007) or (iii) the role of entrepreneurship in regional development (Deller, 2010; Xu and Lambert, 2011; Pijnenburg, 2013). Deller (2010) analyzes the role of microenterprises on regional growth in US counties and explains that there is spatial heterogeneity of this relationship depending on the type of industry and their size. Cravo (2010) or Xu and Lambert (2011) highlight the heterogeneous effects of business creation on economic growth in developing regions. Finally, Pijnenburg (2013) studies the effect of self-entrepreneurship on regional development at the NUTS 2 region level using this method. It shows that in European regions where the effect is positive and significant, self-entrepreneurship is lower than in regions where the effect is significantly negative.

The GWR model is formalized as follows:

$$\mathbf{y}_i = \sum_j \mathbf{x}_{ij} \mathbf{a}_j(\mathbf{u}_i, \mathbf{v}_i) + \boldsymbol{\varepsilon}_i \quad (1)$$

Where $(\mathbf{u}_i, \mathbf{v}_i)$ is the location in a geographical space of the i th observation. In the calibration of the GWR model, it is assumed that the observed data close to an " i " point have more influence in estimating the values of $\mathbf{a}_j(\mathbf{u}_i, \mathbf{v}_i)$ than the data located away from " i ". The choice of the weighting regime is an important step in the spatial model estimation procedure. The logic behind this choice is that the observations closest to the localization exert more influence on the parameters estimated at this location than the closest observations. Thus, the weight can be considered as a continuous and strictly decreasing function of the distance that separates the housing from the location. The family of Kernel functions has these properties. Several variants of these functions have been proposed in literature to construct the matrix. The most used is the Gaussian function as proposed by Brundson et al. (1998). It produces an exponential decrease in weights and is defined as follows:

$$\mathbf{w}_i = \left[1 - \left(\frac{\mathbf{d}_{ij}}{\mathbf{b}} \right)^2 \right]^2 \quad (2)$$

Where $\mathbf{b} > 0$ and is defined as the range of the function, in other words the radius of the zone of influence of the point i .

Fixed-window spatial kernels can give exaggerated variability in locations where observations are scattered. Similarly, they can mask variability in locations where observations are dense. This is the case for European regions at NUTS level 2 because their size varies. To overcome this problem, spatially adaptive weighting functions are incorporated into the GWR model. These functions have the advantage of adapting the weighting window as a function of the density of the observations around each regression point. According to Fortheringham et al. (2002), the best window to be retained is obtained according to the

criterion of minimization of the "cross validation", analogous to the minimization of the sum of the squares of the residues.

3.2 The data

The level of GDP/hab is the model dependent variable. The data collected is from the ESPON database and Eurostat for 2011. The sample comprises 246 regions of the European Union. For statistical reasons related to island or enclave problems, Cyprus, Malta, the Canary Islands, the Azores, Madeira and the Overseas Territories were excluded. Le Sage (2004) explains that the presence of such aberrant observations can influence GWR estimates. In addition, Romania, Bulgaria and Croatia were excluded from our analysis due to lack of data.

In an entrepreneurial economy, growth and newly created jobs are mainly driven by new firms. The entrepreneurial environment - measured here by the REDI - would therefore contribute to the explanation of the different levels of development between the European regions, all the more so as the variables favorable to quality entrepreneurship are also favorable variables for development of existing companies.

In our model, we have chosen to integrate population density as a proxy for agglomeration economies. Numerous works in regional economics have shown the links between metropolitan regions and regional economic performance (Dunford, 1994; Petrakos et al., 2005; Geppert and Stephan, 2008; Camagni and Capello, 2013). Population density refers to the greater ease of individuals to exchange, to take advantage of infrastructure in dense environments and in an information economy, thus tracing the privileged growth of urban agglomerations. In addition, Bosma and Sternberg (2014) showed that the size of the urban area was positively correlated with the quantitative and qualitative potential of the entrepreneurial opportunities for economic growth.

We added the long-term unemployment variable because it highlights the effects of the labor market (more or less flexible) that penalize job creation, especially in some European Union countries because of different regulations of the labor market at a national level but also of different levels of development or even of structural crisis situations. This rigidity in the labor market and the presence of individuals whose ability to find work is limited because of their inadequate skills (Gordon, 2001) explains the inclusion of this variable in our model. As Rodríguez-Pose and Crescenzi (2008) have shown, long-term unemployment limits the ability of regions to assimilate the benefits of knowledge and thus to achieve a high level of regional competitiveness (Dijkstra et al., 2011). Finally, a high proportion of unemployed individuals may indicate low levels of local demand and unfavorable conditions for start-ups that produce mainly for the local market (Fritsch and Schroeter, 2011)

Table 1: Descriptive variables

<i>Variable</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Relative Std. Dev.</i>
<i>Dev2013</i>	10400	148400	26742	11884	0,44
<i>LTUnempl</i>	0,8	20,7	4,9	4,4	0,89
<i>Dens</i>	3,4	10589,2	403	1138,6	2,82
<i>REDI</i>	19,5	82,2	48	14,5	0,302

The dev2013 variable represents the level of GDP per capita in the European regions in 2013. The variable LTUnempl represents the long-term unemployment rate, the Dens variable measures population density and REDI is our indicator of entrepreneurship. The coefficient of variation is the highest for the population density, then the long-term unemployment rate, the level of development and finally the REDI.

4. The spatial heterogeneity of the influence of the entrepreneurial context on regional development

The level of regional economic development was modeled as a function of a set of parameters described in Table 2. In order to study the spatial heterogeneity of the developmental gaps, we developed a model from the GWR. The test of the presence of spatial autocorrelation in the residuals of the GWR model using the Moran statistic I makes it possible to evaluate the degree of dependence between the close observations. The results (Table 2) confirm that the chosen model is not biased since no spatial autocorrelation is observed in the model residuals. On the other hand, as the literature has already amply demonstrated, the Moran index of Y_i , t ($I = 0.71$) indicates that the level of development of a region is influenced by that of neighboring regions.

Table 2: Results of GWR

Variable	Mean	Min	Max	Range	Lwr Quartile	Median	Upr Quartile
Intercept	8,665 (0,005)	7,969	9,968	1,999	8,254	8,553	8,980
LTunemp	-0,181 (0,004)	-0,256	-0,106	0,150	-0,220	-0,185	-0,140
dens	0,129 (0,003)	0,080	0,182	0,102	0,107	0,129	0,150
REDI	0,254 (0,006)	-0,132	0,454	0,585	0,170	0,299	0,380
Control var. FDI	0,003604 (0,001)						
AICc	-65,703						
R ²	0,670						
Ajusted R ²	0,648						
I Moran of the standardized residuals	0,093						

The results first show that the different parameters of the model are all statistically significant and positively influence regional growth, with the exception of long-term unemployment. Local parameter statistics show a sign change for a predictive variable. The comparison of the minima and maxima of the REDI local parameter estimates (min = -0.132; max = 0.454) indicates that the direction of the relationship with regional development varies in the EU. In the case of population density and long-term unemployment, we did not detect any sign changes, but we found significant regional variations in the strength of the relationship with regional development (see maps below). The results confirm that neglecting spatial heterogeneity in a global model leads to erroneous results.

In general, the level of regional development appears to be higher as the entrepreneurial environment is favorable. This is understandable by identifying the refugee/Schumpeter effects (Thurik et al., 2008; Abdesselam et al., 2014). The Schumpeter effect reflects the fact that new enterprises launched for reasons of opportunity can contribute to the reduction of unemployment (Thurik et al., 2008; Koellinger and Thurik, 2012). In fact, the reasons for the creation of companies are reflected in different potentialities in terms of growth and jobs. For example, at the national level and using snapshot data from 37 GEM countries in 2002, Wong et al. (2005) show that among the different types of entrepreneurial activity, only the creation of companies with high growth potential has a significant impact on economic growth.

In addition, the "metropolitan" effect for which densely populated regions are those with the highest levels of economic development is identified. We find here what has been widely shown on the economies of agglomeration in the literature of the New Geographical Economy.

Finally, long-term unemployment appears to have a negative influence on the level of economic development of the regions as described in the literature (Fagerberg et al., 1997; Cappelen et al., 2003; Rodríguez-Pose and Crescenzi, 2008; Crescenzi And Rodríguez-Pose, 2012; Marelli et al., 2012).

The coefficients of determination show a regular spatial trend across European regions (Map 1). The explanatory power of the characteristics retained in the analysis varies across European regions and tends to grow towards the East. This spatial trend suggests that other factors may be important determinants of the regional development level in the Northwest regions. There is a greater explanatory power for low levels of development and a lower explanatory power for high levels of development. In other words, a low REDI better explains a low level of development (Map 2). A strong REDI undermines a high level of development (except for some regions such as Northern Europe where the correlation is strong).

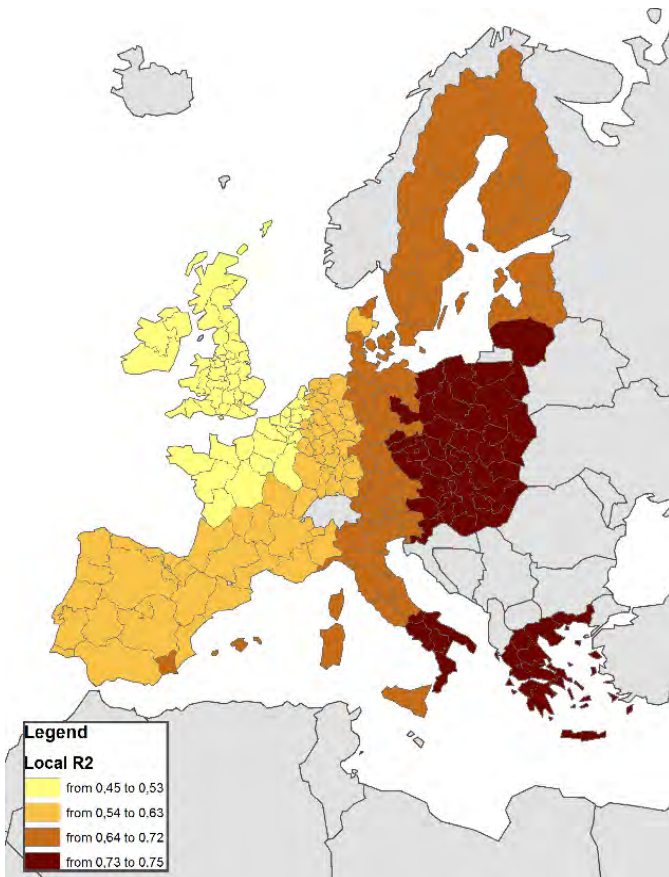


Figure 1: GWR- local R2

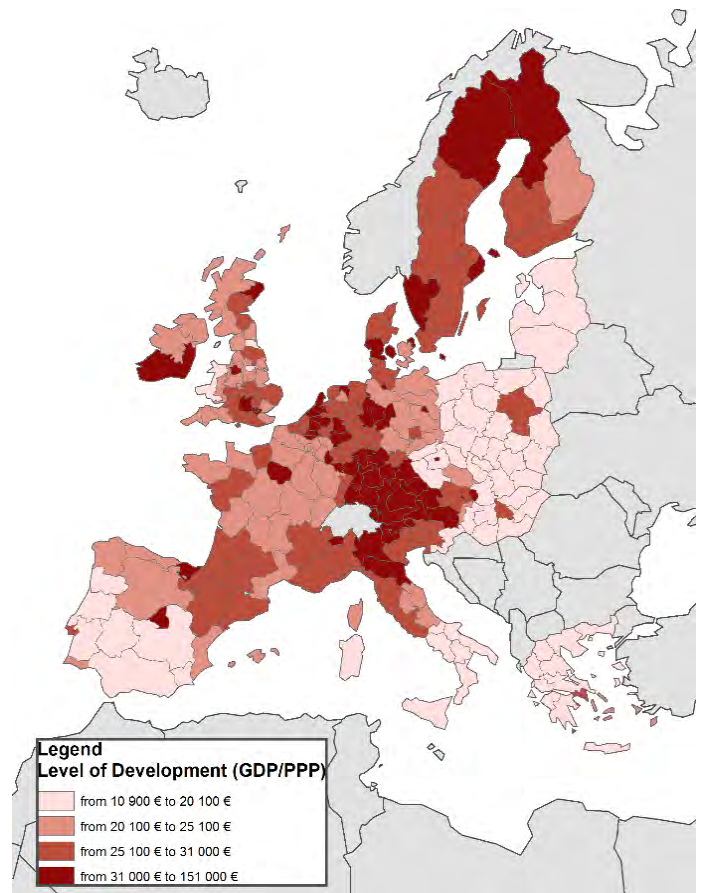


Figure 2: Local estimate of level of development variable

The GWR makes it possible to locally approach the significant variation in regional economic development between regions and the magnitude of the gaps. The visualization of the coefficients of the GWR model allowed by this method highlights the spatial variations of the parameters (maps 4 and 6). The advantage of mapping t-values in addition to local parameters is that the t-values capture both the direction (sign) and the force (quantity) of the local relationships between the independent variables and the level of regional development.

The mapping of the t-values of the model synthesizes the relationship between the level of regional development and the REDI (Map 4). The estimated coefficients vary significantly in space in direction and magnitude. The map of the effects of the entrepreneurial environment on the level of regional development suggests a positive impact in Scandinavia, Greece and the CEECs. This confirms that the entrepreneurial context counts (Welter, 2011; Autio et al., 2014; Szerb et al., 2015). For the latter, the entrepreneurial environment is unfavorable and thus seems to have a significant influence on the low levels of development observed.

The measure of entrepreneurship of opportunity suggests that its conditions are important elements of the development of the less developed countries. As several authors have recently shown, the institutional context counts in the level of regional development (Kaufmann and Kraay, 2003; Glaeser et al., 2004; Arbia et al., 2010; Rodriguez-Pose, 2011; Farole et al., 2013; Rodríguez-Pose and Di Cataldo, 2014) and business creation (Aidis, 2005; Aidis et al., 2008; Dreher and Gassebner, 2013). If one can observe the creation of companies in these countries, too often they are for reasons of necessity. Not only is the survival of this type of business low, but it contributes little or no to regional growth. This is what Manolova et al. (2008) showed in constant low levels of entrepreneurship in some CEECs due to low confidence in institutions and insufficient capacity to create new businesses. The authors argue that this low confidence could be explained by the fact that they are countries in economic, social and political transition. This explains the strong influence of REDI in these countries and the explanation for the low level of regional development. To this end, Szerb et al. (2017) explain that the entrepreneurial performance of these countries is lower than for the countries of Mediterranean and Western Europe. The authors also showed that, in general, the regions of Central and Eastern Europe have a low score in the pillars of REDI concerning entrepreneurial attitudes but relatively strong in the pillars focused on entrepreneurial aspirations. Thus, we find here both the lack of a favorable entrepreneurial environment but also the effect of entrepreneurship by necessity.

Conversely, in a part of the northern French regions and in Hanseatic Europe, the REDI score obtained by these regions seems to have a negative impact on the level of regional development, which is high to very high for these regions. In another study (Abdesselam et al., 2017) the authors show that there are different entrepreneurial regimes in Europe. In particular, the *“Non-entrepreneurial advanced knowledge and service economies with opportunity Entrepreneurship”* group, which includes France and Benelux. In these countries (the most developed in terms of GDP/inhabitant), the mortality of new firms is rather low, the survival rate of new firms at 5 years is good and there are few creations per

necessity, unemployment rates (current and long-term) are rather low and the share of the self-employed is also low. These countries are also relatively less entrepreneurial than some less developed countries, so they are characterized by more wage-based economies in which much of the development is also based on existing firms.

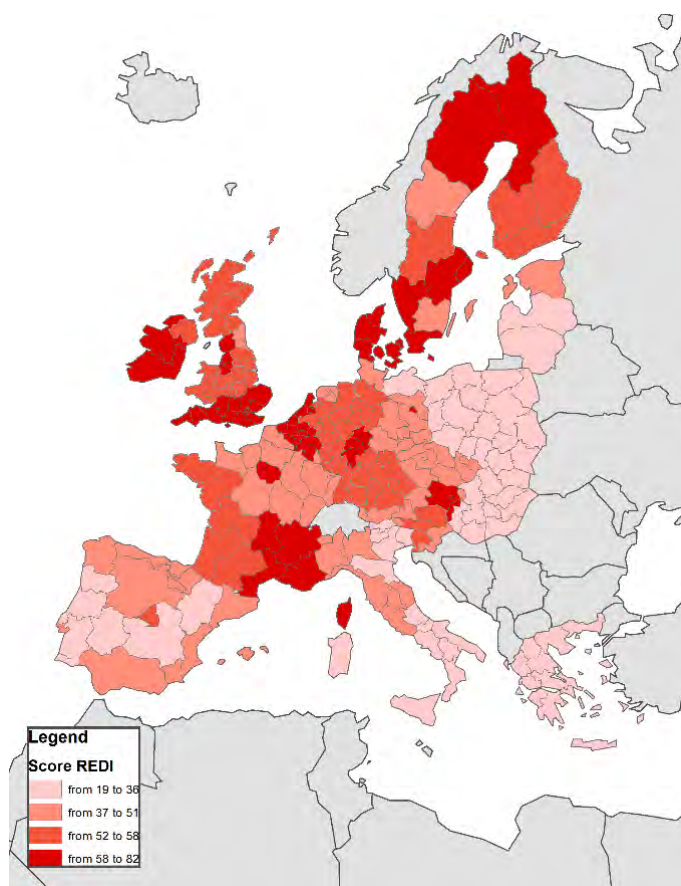


Figure 3: Local estimate of REDI variable

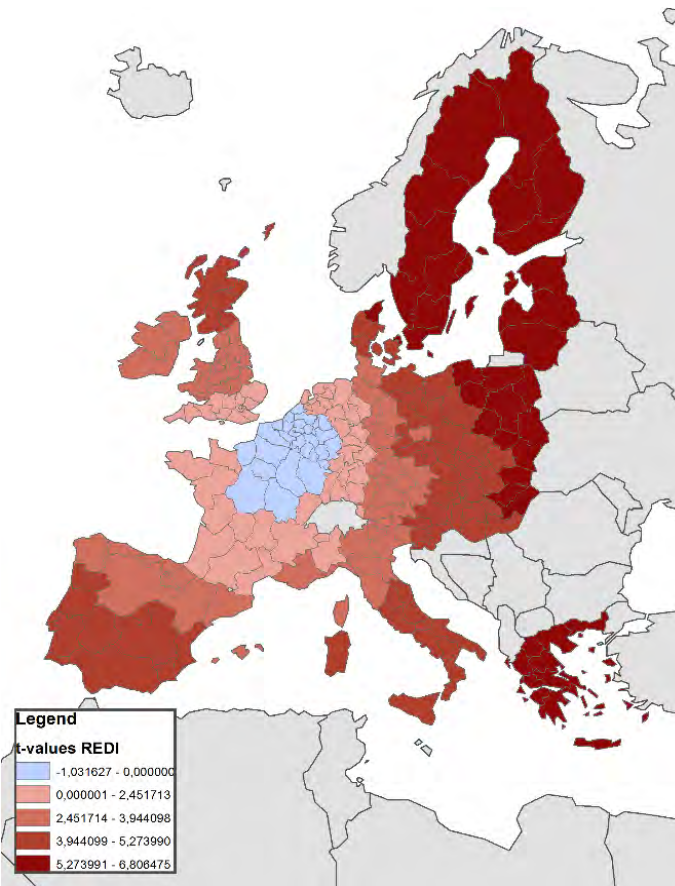


Figure 4: Local t-value of REDI variable

Long-term unemployment appears to have a stronger and negative influence on regional development in Central Europe, Scandinavia and the Baltic countries (Figure 5). For the regions of Central Europe and the Baltic countries, it can be assumed that the very important influence of the long-term unemployment rate on their level of regional development is more due to the persistence of structural and historical conditions linked to their communist past. These "entrepreneurial laggards" (Vaillant and Lafuente, 2007) thus have much to do to improve their entrepreneurial context. It is also understandable why in these countries business start-ups are created more by necessity (because of long-term unemployment) than by opportunity (low favorable entrepreneurial environment). Conversely, for the United Kingdom, where the long-term unemployment rate has little influence on the level of development, an explanation can be found for the fact that the labor market is very flexible (Barbieri, 2009).

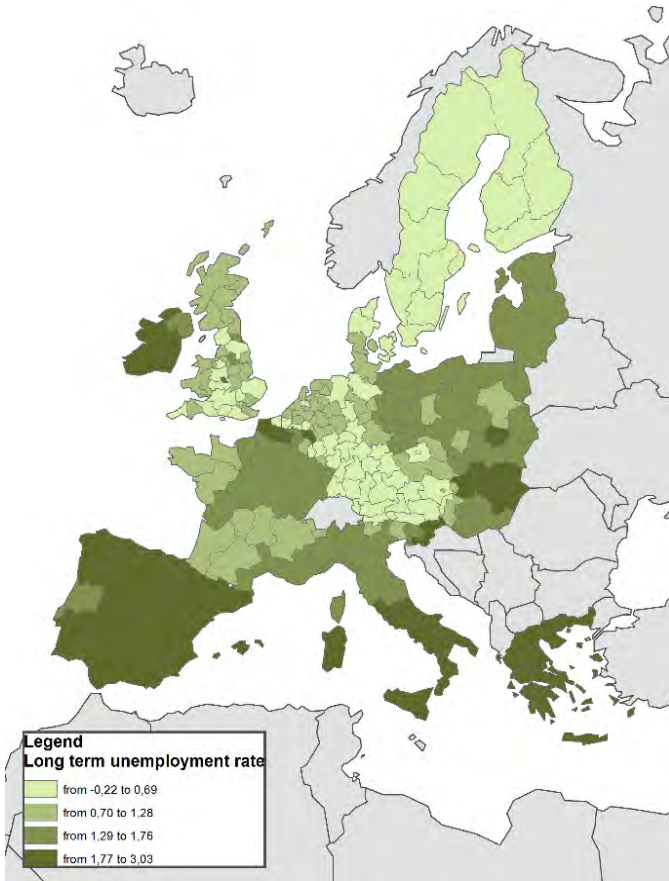


Figure 5: Local estimate of Long term unemployment rate variable

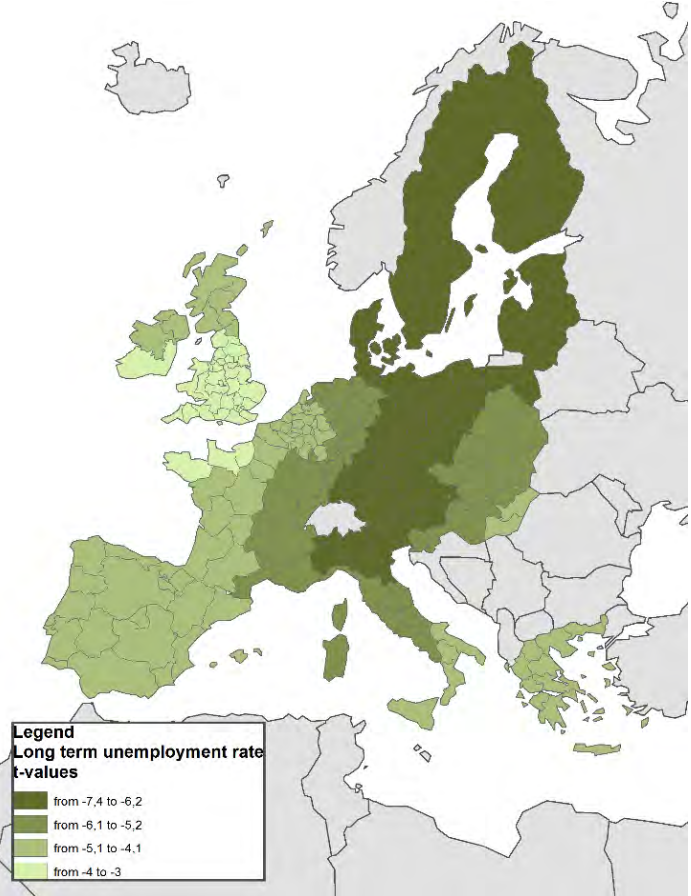


Figure 6: Local t-value of Long term unemployment rate

5. Conclusion and discussion

The evidence presented here suggests that differences in the level of the entrepreneurial environment contribute in part to explaining the differences in the level of regional development. By combining the results of other research showing that opportunistic entrepreneurship leads to higher levels of economic development, we argue that the context in which the entrepreneur creates his business counts. In this sense, encouraging the creation of enterprises is not enough, it is also necessary and above all to create favorable conditions for the creation of companies with high sustainability and job creation rates. The quality of enterprises created is more important than quantity (Szerb et al., 2014) and therefore calls for an institutional system of entrepreneurship that is institutionalized between entrepreneurial attitudes, capacities and aspirations of individuals (Ács et al., 2012).

We find interesting spatial variations which show that if the index of REDI is linked to the level of development, it is all the more so as the level of the index is low. For high index levels, which in fact correspond to high levels of development, REDI does not record the highest impacts on the level of development. In fact, if in the more developed regions, opportunistic entrepreneurship is a characteristic due in particular to the high opportunity cost of undertaking, the favorable environment is also favorable for existing firms. The most

developed regions are not entrepreneurial regions, but rather wage regions where there are business start-ups.

In this context, promoting quality entrepreneurship in the less developed regions of the EU is a necessity. It is not only a question of improving the human capital (skills and education) of entrepreneurs and of fostering entrepreneurship towards innovation, but rather of implementing the conditions for a favorable entrepreneurial environment for the creation of enterprises. Reducing need-based entrepreneurship in favor of opportunistic entrepreneurship requires profound institutional and socio-economic changes, especially in the CEECs. Referring to the literature on endogenous growth, this article explains that, in addition to the traditional factors of growth (human capital formation, R & D spending, infrastructure levels among others), institutional conditions and good governance count (Rodríguez-Pose, 2011; Farole et al., 2013; Rodríguez-Pose and Di Cataldo, 2014) to promote quality entrepreneurship as a factor in economic development. Given the spatially differentiated impact of opportunistic entrepreneurship on regional development, it seems necessary to put in place public policies for economic growth and entrepreneurship accompaniment specific to each region, and more “one size-fits-all” approaches.

Thus, European policy-makers must continue their active reorientations of the Cohesion Policy and of European policies for the development of entrepreneurial activity towards “place-based approaches”. They must support entrepreneurial capacities (technological absorption capacity, human capital formation, competition regulation), promote entrepreneurial aspirations (product and process innovation, internationalization, venture capital) and generate entrepreneurial attitudes (networking, Entrepreneurial skills, perception of opportunities, support for start-ups). This is all the more important given that in the CEECs with a high long-term unemployment rate and a developed informal economy, fostering a greater entrepreneurial opportunity and entrepreneurship is an important mechanism to reduce these two phenomena. Like Baumgartner et al. (2013), we support the idea of a more territorialised approach to entrepreneurship and identify the conditions under which entrepreneurial potential will be maximized by a favorable entrepreneurial environment.

In another study on “entrepreneurial regimes”, the authors (Abdesselam et al., 2017) show that it is only a certain level of development that allows the prevalence of entrepreneurial opportunity. In less developed countries, politicians must then alleviate certain constraints on entrepreneurship and the functioning of the labor market, but only if they are in a good governance environment, otherwise the risk of “revolving door effect” exists. More specifically, a certain degree of efficiency in public services, the function of competitive

markets both in the product market but also in the labor market, and an opening up of the country are required.

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Appendix

The REDI is a complex indicator that is the average of three sub-indexes, an index of attitudes to entrepreneurship that traces how the country sees entrepreneurial activity, an index of entrepreneurial skills that traces how the country and individuals in the country are in relation to the implementation of the entrepreneurial project (do they have the capacities? can they do it?) and an index of entrepreneurial aspiration which traces the ambition of the country and individuals by comparison to the companies created (for example, do you envisage creating a start-up that will raise millions of dollars?). These three sub-indexes are based on 14 pillars, each corresponding to a microeconomic aspect and a macroeconomic aspect of entrepreneurship. Unlike other indexes that incorporate only institutional or individual variables, the pillars of the REDI include both at the same time ... These pillars are an attempt to capture the open nature of entrepreneurship.

Opportunity Perception	Opportunity Perception refers to the entrepreneurial opportunity perception potential of the population and weights this against the freedom of the country and property rights
Start-up Skills	Start-up Skill captures the perception of start-up skills in the population and weights this aspect with the quality of education
Risk Acceptance	Risk Acceptance captures the inhibiting effect of fear of failure of the population on entrepreneurial action combined with a measure of the country's risk.
Networking	This pillar combines two aspects of Networking: (1) a proxy of the ability of potential and active entrepreneurs to access and mobilize opportunities and resources and (2) the ease of access to reach each other.
Cultural Support	The Cultural Support pillar combines how positively a given country's inhabitants view entrepreneurs in terms of status and career choice and how the level of corruption in that country affects this view.

The 14 pillars of entrepreneurship are: For entrepreneurial attitudes: Perception of opportunity, entrepreneurial skills, risk acceptance, networking and cultural support.

For entrepreneurial capacities: Creation by opportunity, Technological absorption capacity, human capital, competition

Opportunity Startup	The Opportunity Startup pillar captures the prevalence of individuals who pursue potentially better quality opportunity-driven start-ups (as opposed to necessity-driven start-ups) weighted with the combined effect of taxation and government quality of services.
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Technology Absorption	The Technology Absorption pillar reflects the technology-intensity of a country's start-up activity combined with a country's capacity for firm-level technology absorption.
Human Capital	The Human Capital pillar captures the quality of entrepreneurs as weighing the percentage of start-ups founded by individuals with higher than secondary education with a qualitative measure of the propensity of firms in a given country to train their staff combined with the freedom of the labor market.
Competition	The Competition pillar measures the level of the product or market uniqueness of start-ups combined with the market power of existing businesses and business groups as well as with the effectiveness of competitive regulation.

For entrepreneurial aspirations: product innovation, process innovation, high growth expectancy, internationalization, risky capital.

Product Innovation	The Product Innovation pillar captures the tendency of entrepreneurial firms to create new products weighted by the technology transfer capacity of a country.
Process Innovation	The Process Innovation pillar captures the use of new technologies by start-ups combined with the Gross Domestic Expenditure on Research and Development (GERD) and the potential of a country to conduct applied research.
High Growth	The High Growth pillar is a combined measure of (1) the percentage of high-growth businesses that intend to employ at least ten people and plan to grow more than 50 percent in five years (2) the availability of venture capital and (3) business strategy sophistication.
Internationalization	The Internationalization pillar captures the degree to which a country's entrepreneurs are internationalized, as measured by businesses' exporting potential weighted by the level of economic complexity of the country.
Risk Capital	The Risk Capital pillar combines two measures of finance: informal investment in start-ups and a measure of the depth of the capital market. Availability of risk capital is to fulfill growth aspirations.

Institutional variables are themselves often complex variables produced from other variables. For more information on the calculation of REDI which is a complex calculation, please refer to the report by Szerb et al., 2013.