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ABSTRACT

The objective of this work is to study employment growth and its determinants in Spain at a high degree of spatial disaggregation. The impossibility of accessing data on GDP at local scale makes this a particularly interesting issue, as employment growth can be used as a proxy of local economic growth and can therefore be expected to provide some insights into the factors determining local economic development. Using the 2001 Census database, we have information on several economic variables at local level (municipalities) which we then aggregate into Local Labour Market Areas (LLMs), as we believe these functional regions may be the ideal level of disaggregation to study employment or economic growth. Based on the ideas of New Economic Geography (NEG), we first analyze the influence of size and geographical position of the LLM on employment growth. As well as considering the Euclidean distance from the LLM to the main metropolitan areas we also use a novel approach based on the notion of incremental distances. Once the importance of the NEG approach is confirmed, we also examine the traditional determinants of economic growth used in macroeconomic studies, but in this occasion applied at local level, such as education, diversification and sectoral structure. Finally, to confirm the relevance of location, spatial auto-regressive models are estimated. Our results show that employment growth is mainly driven by geo-economic variables such as size and distance instead of the economic policy variables in the hands of the central or regional governments.

Keywords: local employment growth, local labour markets, NEG, incremental distances, local and regional policies, Spain.
JEL classification: R1, R12

1.- INTRODUCTION

What places grow faster? How relevant are geographical factors to local employment growth and how effective can political action be? How important is city size and how important is the distance to the largest cities? Do the same factors affect growth in the same way in urban and rural areas? How relevant is the regional economic environment to the local growth?

We have these questions and many others in mind for this research. Our main objective is to make a contribution to the understanding of Spanish local growth using an empirical approach.

There is a considerable amount of theoretical literature on economic growth and even more empirical papers that study this issue, including the Spanish case. However, most of the empirical analyses are proposed at national or regional level using the politico-administrative regions (Autonomous Communities or Provinces, in the Spanish case). Studies involving a local scale are much less common, and for the specific case of Spain there are hardly any papers. This lack of studies of local growth is due to several reasons.

First, local growth analysis suffers from data limitations for most countries, and this limitation is particularly relevant in the official Spanish statistical system. Information on GDP or other variables with which to measure economic growth is not available at a local level in Spain. The maximum level of spatial disaggregation of GDP available in this country is the provincial level (NUTS III). If we are interested in studying local growth we must assume the need for some type of approximation or proxy of GDP at local level. In the literature the use of employment growth is quite accepted as an approximation to economic growth. This variable is commonly available at a higher degree of spatial disaggregation, though we must be aware of the different behaviours these two variables (GDP and employment) may have and the limitations due to the lack of more suitable local data.

A second problem which might explain the small amount of published empirical research about local growth is the inconsistencies usually found in this type of studies. Previous studies for other economies find contrasting evidence about the performance of economic growth theories when using very local data and considering the entire geographical territory. It has been suggested that identical factors may exert their influence in different ways depending on the period analysed (Massey, 1995; Shearmur

and Polèse, 2007; Strambach, 2001). In their study of Canada, Shearmur and Polèse (2007) show that although local employment growth can be quite well modelled over three decades, the influence of specific factors differs across time. For instance, education levels, strongly associated with employment growth in the 1980s, were not associated with employment growth in the 1970s and 1990s. Blien, Suedekum, and Wolf (2005), who analyse the effect of diversity and industrial concentration on growth in Germany, show that industrial structure only tends to have a short-term effect, while Strambach (2001), writing about Stuttgart in the early 1990s, states that "during global changes, a given top position in technological fields is no guarantee of the future competitiveness of a region." One may thus conclude that industrial structure does or does not have an impact on growth depending on the period analysed. These three studies demonstrate that the effect of any particular factor on local employment growth may depend on time, but more importantly, also on the *location* within a country.

With these issues in mind and adopting an empirical approach, in this research we explore local growth for the Spanish case and aim to provide a better understanding of its determinants and how local characteristics can affect the outcome. First, however, we have to choose the *local* unit of analysis and justify the use of such units in this research. Thus, a brief discussion on the concept of functional areas, specifically *local labour market areas* (LLMs), is offered in Section Two. In this section we also summarize the main factors that may determine employment growth on a local scale. In Section Three, a general empirical model is proposed and adapted to the characteristics and existing information for the Spanish economy. The need to have data at very disaggregated level (municipalities) means we are restricted to using the Spanish Census from 2001 (the last one published) and detailed data from the National Centre for Geographical Research (CNIG) on geographical characteristics related to location and distance to the main metropolises. Using the concept of *incremental distances* (Partridge *et a*l., 2008 and 2009), results from the simple linear model shown in Section Four conclude that employment growth seems to have a strong location component. Hence, in Section Four we also estimate spatial auto-regressive models (Anselin, 1988; Anselin, Florax, and Rey, 2004). Each of the econometric models provides insights from a different angle and allows us to refine our conclusions. The final section summarizes the main contributions of this analysis and proposes future lines of research.

2.- UNDERSTANDING THE DETERMINANTS OF EMPLOYMENT GROWTH AT A *LOCAL LEVEL* AND PROPOSING AN EMPIRICAL APPROACH

A starting point: a proper definition of local level

What do we understand by *local level?* A number of researchers, initially in the United States from the 1960s (Fox and Kumar, 1965), and then in Europe from the 1970s (Smart, 1974), have devised quantitative techniques for the identification of local units or local areas that were consistent with the theoretical framework of *Regional Economics*. We can find different delimitations of areas that exceed the administrative boundaries based on different criteria, such as spatial uniformity, homogeneity between its basic units or even differentiation between them, in this last case with an urban centre surrounded by a fringe (Meyer, 1963) such as *functional economic areas or analytical areas.* We are going to focus on one of the many regionalisation schemes - the *Local Labour Market Areas* - which are areas or regions that internalize the home-to-work daily journeys of its residents. Sforzi et al. (1997) defined these functional regions for Italy and called them *Sistemi Locali del Lavoro* (in English, *Local Labour Market Areas or LLMs*). After that, *LLMs* were updated on the basis of the data collected by the Censuses of 1991 and 2001. A complete explanation of the procedure is presented in Sforzi and Lorenzini (2002) and Sforzi (2012). The regionalization method developed for the ISTAT by Sforzi was applied for the Spanish territory by Boix and Galleto (2006), identifying 806 LLMs.

These travel-to-work areas show very interesting characteristics for the purposes of our analysis. Recognizing that labour plays a basic role in people's life and guides their territorial behaviour with regard to the election of the municipality where they live and also work, LLMs has the advantage of including in the same area both locations. This is a very important quality, because when using databases at a very high level of disaggregation, and due to confidentiality issues, some information on the place of work can be censored for small municipalities. However, this is not usually the case for information on employed population living in small municipalities, guarateeing that we are comprising almost the total employment growth in the area regardless of the place of residence. (Sforzi, 2012; Rubiera and Viñuela, 2012). Moreover, an LLM describes a place that corresponds to the area where the local population develops most of its economic and social relationships; it is a place where the common interest of the local population can be identified as a whole and therefore an appropriate level for implementing policies at regional level (Parr, 2008).

Delimitating the factors of employment growth at a local level

Local employment growth, and indeed local development, can be affected by several factors that can be classified in three groups. The first type of factors deals with the local institutional context (Cooke, Heidenreich, and Braczyk, 2004), the specific actors (Galaway and Hudson, 1994), and the inter-firm dynamics and knowledge spillover (Malecki and Oinas, 1999; Porter, 1990). In particular, researchers in the field of innovation studies describe how certain regions have managed to develop local innovative systems by combining these factors in particular ways (Cooke *et al*., 2004). However, such factors are difficult to measure and include substantial qualitative components, making their effects difficult to capture using a statistical approach (Doloreux, Shearmur, and Filion, 2001). Numerous case studies have described how such factors can induce employment growth at a local level, but despite these cases, it is difficult to draw general conclusions (Markusen, 1999). Rather, a set of best practices are determined and can serve as a basis for implementing policies in other regions.

The second type of factors that can affect local employment growth are also local in nature, but can more easily be measured. An area's endowment of human capital (Florida, 2002; Romer, 1989), its industrial structure (Porter, 1998), its local costs (Weber, 1929), and level of diversity (Jacobs, 1984; Porter, 1990) are all put forward as growth factors. The effect of such factors on employment growth is verified by statistical analysis of various sorts: usually a large group of regions or cities is considered, and the effect of each factor on growth is then determined using techniques such as regression analysis (Beckstead and Brown, 2003; Florida, 2002; Shearmur and Polèse, 2007). Similar techniques are also used to identify growth factors for nations (Barro and Sala-i-Martin, 1995). Some general conclusions can be drawn from this type of analysis. Florida (2002), for instance, suggests that a highly educated local workforce is conducive to local growth (of employment and income). Henderson (2003) shows that local specialisation in certain industries tends to lead to employment growth in the industry; while Quigley (1998) shows that for a region, a diverse economy tends to be associated with higher growth. These conclusions are not always generally accepted and can be contradictory. For instance, as Blien, Suedekum, and Wolf (2005) point out, there is an ongoing debate between researchers who defend that a diverse economy leads to growth (Jacobs, 1984; Markusen, 1996; Quigley, 1998) and those who defend that specialisation is conducive to growth (Porter, 1996). Florida's (2002) contention

that for regions an educated workforce is conducive to growth, while to some extent compatible with human capital theory, is not supported by evidence in the Canadian case after controlling for other growth factors (Shearmur and Polèse, 2007). Thus, despite the theoretical possibility of deriving general conclusions about the effect of certain measurable local factors on growth, a general model has so far proven elusive.

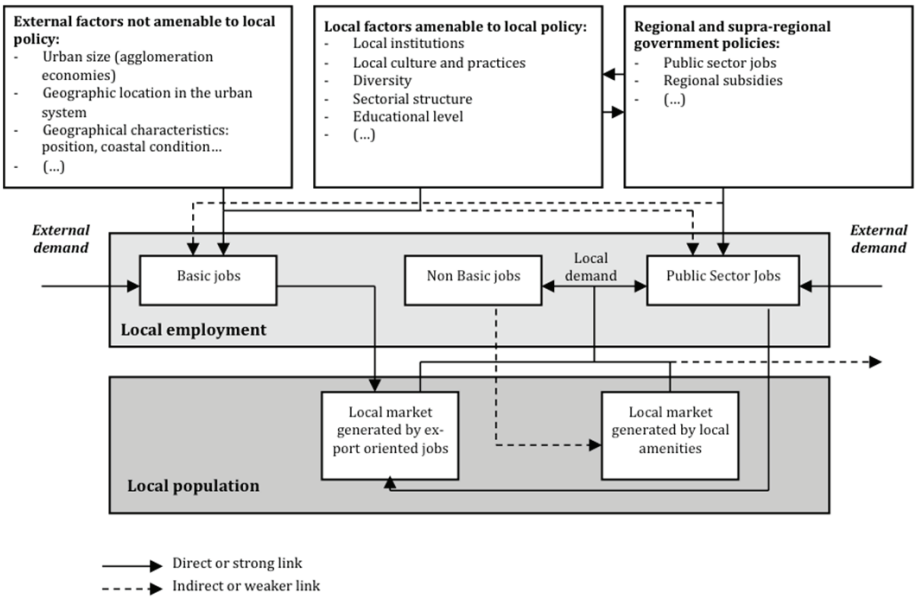
The third type of factors to be considered when analyzing local employment growth are structural. By *structural* we do not mean the industrial structure (which we consider to be a local factor of the second type), but the geographical and historical structures. Geographical location and, particularly, the proximity to markets (Krugman, 1995; Partridge *et al*., 2006), the historical trends or accidents (Krugman, 1995; Davis and Weinstein, 2002), and the centre–periphery and urban–rural divide (Parr, 2001) have been suggested to have an effect on employment growth outcomes.

To the extent that there has been greater emphasis on local development over the last twenty years (Martin and Sunley, 1998; Parr, 2001), policy makers have tended to show less interest in these wider structures (Eisinger, 1988; Keating, 1993). This can partly be attributed to the failure of top-down policies implemented in the 1960s and 1970s, which were aimed at balancing growth across wide geographical areas, and partly to the fact that statistical models, which are used to describe geo-structural effects, fell out of fashion over this period (Philo, Mitchell, and More, 1998). They were often seen as too simplistic - unable to deal with the qualitative factors that are also important for understanding development - and as tending to make grandiose claims about development factors that did not bear out in practice.

Employment local growth: empirical proposal

The general ideas summarized above may be synthesized and schematised in the diagram shown in Figure 1. On the basis of the relationships between local factors that can be affected by economic policies, geographical or structural factors (fixed in the short and medium run) and regional/supra-regional factors (depending on the national or regional policy adopted) a model can be proposed to estimate the causal mechanism of employment growth at local level.

FIGURE 1. A SCHEMATIC REPRESENTATION OF LOCAL EMPLOYMENT (AND POPULATION) GROWTH FACTORS AND PROCESSES



Source: Rubiera (2005).

Our objective is to translate these ideas on factors affecting the local process of employment creation into an empirical approach.

In line with the idea that population and employment in a local area have a bivariate causal relationship (Freeman, 2001) for this case, the dependent variable will be the total local employment growth in each region (G_{emp}), while the total local population will be used as an explanatory term. This G_{emp} variable is measured as the logarithmic growth rate between 1991 and 2001. The first year of the period is used as base year.

Despite the severe limitations on statistical information at high levels of disaggregation in Spain, we can include some quantitative variables representing *local* factors intrinsic to the area under study and which are susceptible to modification by economic policies.

First, a variable to measure the effect of the educational level (E) is introduced. This variable is defined as the percentage of the total population living in that LLM in the base year with a university degree.

The degree of specialisation/diversity of the territory (*S*) in the base year is the next local variable considered. In accordance with Shearmur and Polèse (2005), we propose the following specialisation index:

$$S_r = \ln\left(\frac{1}{\sum_{i=1}^{n} e_i} \sqrt{\sum_{i=1}^{n} \left(e_i \left(lq_i - 100\right)\right)^2} \right) \qquad [1]$$

where S_r is the specialisation index for area *r*; lq_i is the location quotient of sector *i* for area *r*; and e_i is the employment in sector *i* for area *r*. Accordingly, values tend to -∞ when the profile in the LLM is identical to the specialization calculated for the whole economy and all location quotients are equal to 100; and values tends to +∞ as the profile diverges from the average specialization of the Spanish territory (the LLM is more specialized in one or more of the *n* sectors analysed). To include possible non-linear effects, this variable is also considered as a quadratic term.

Apart from the *S* index, we introduced location quotients as separate terms that provide information about the specific sectors in which a local area is specialized. This could be relevant specially referring to some strategic sectors like knowledge intensive business or services. As location quotients (*LQ*) we use the most common formulation, comparing the employment share on one sector in an LLM with the equivalent share at national level. Thus,

$$LQi = \frac{e_i / e}{E_i / E} \qquad [2]$$

where LQ_i is the location quotient of sector *i* applied to one LLM, e_i is the employment in sector *i* in that LLM, *e* is the total employment in the LLM considered, E_x is the total sector *i* employment in Spain, and *E* is the total employment in Spain.

As a *political* factor, we decided to include in the model a dummy variable *C* which takes a value 1 if the *LLM* contains an administrative capital of a province, and a value of 0 otherwise. This variable shows the influence of being named the administrative centre of the province, thereby concentrating a large part of the public sector jobs and offering public services. One might argue that the areas including the capital city are usually the larger ones in terms of population. However, this criticism vanishes immediately when including such as important geo-structural factor as size.

The *geo-structural* factors that cannot be modified in the short and middle term provide information on the characteristics of the LLMs. According to Parr (2002), in the *geo-structural* approach there are two basic dimensions that must be taken into consideration: size and location.

In Regional Economics, the *size* of a country or region is commonly quantified in terms of population. Some researchers suggest that the flows of economic activity tend to favour more urbanized areas, and others state that flows *within* urban areas tend to favour larger cities. Ross Mackay (2003) conducted a study on employment growth in Britain adopting both approaches. In Canada, Coffey and Polèse (1988), Coffey and Shearmur (1996) and Polèse and Shearmur (2004) described the distribution of employment growth *across* the urban system and *between* central and peripheral areas. For the analysis of the Spanish case, Polèse, Shearmur and Rubiera (2006) applied a classification of the local units based on the degree of urbanization (metropolitan area, urban or rural area) and also the proximity to a big metropolitan area (central or peripheral). All these studies show a strong trend for employment growth, particularly in strategic economic sectors such as high order services, to concentrate in and around cities, and more specifically, in and around large metropolitan areas. Nevertheless, the possibility of existence of *agglomeration diseconomies* must be taken into account. To evaluate these ideas we incorporate the population size of each locality to this analysis by means of a variable *P,* introduced as the logarithm of the population of each spatial unit.

Second, as important as the *size* of each locality is their position in the context of the urban structure of the country. Following Polèse (2009), we consider a number of essential facts: (i) *location* matters, because industries (and therefore economic activity and employment) are always drawn to places best suited for commerce and interaction with markets; and (ii) *size* matters, because dynamic industries, or the most advanced in each epoch, are naturally drawn to large cities and places within easy reach regarding the relevant market. A corollary can be deduced from (i) and (ii), namely: (iii) proximity to size also matters. Another basic idea of Regional Economics is: (iv) *cost* matters, because without adequate *size* or a propitious *location*, places will grow if they have a clear labour cost advantage or, alternatively, an exceptional resource endowment. Having defined the basic spatial unit (*LLM* areas), in order to include the importance of *agglomeration/urbanization* and *distance* to the major population concentrations, the next step is to introduce some way of measuring such ideas.

Following Coffey and Polèse (1988) and Polèse and Champagne (1999), among others papers, we propose a classification of the space by *size* and *distance* levels. To illustrate this approach, Figure 2 shows a schematic representation for an idealized national space economy. Each cell is a municipality (administrative local unit) which are aggregated into *LLMs* (blue line). The reader will undoubtedly note the resemblance with the classic idealized economic landscapes of Christaller (1935), Lösch (1938), and Von Thünen (1826); all of which posit one metropolis or marketplace at the centre. Thus, Figure 2 represents a big, in terms of population, *LLM* at the centre (the main metropolis, containing different municipalities), but also some smaller urban *LLMs* of different population sizes around it. The rest of them are considered *rural* according to population *size*. First we just could classify this idealized space by *size* in, by instance,

(i) *Metropolitan areas*: *local labour markets* with more than certain population size.

(ii) *Urban areas: LLMs* not big enough to be considered a *metropolitan area itself*.

(iii) *Rural areas: LLMs* of small size.

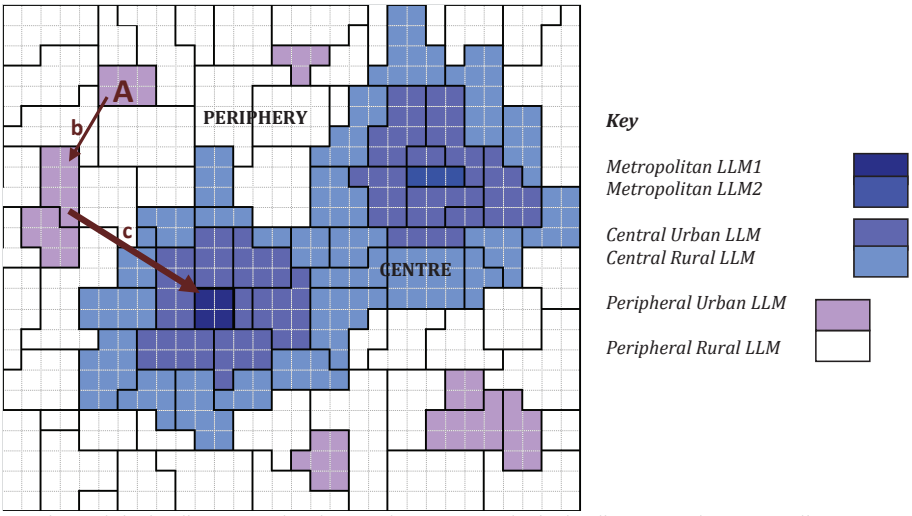
A parallel distinction, based on proximity to the major metropolis, is applied to all non-metropolitan LLMs:

(i) *Central: LLMs "*close" to the big *metropolitan area.*

(ii) *Peripheral: LLMs* located "far" from *the metropolitan area.*

The problem, as the reader could imagine, is how we can define being located "close" or "far" from a big *Metropolitan area*. An ingenious way of solving this was recently proposed by Partridge *et al*. (2008 and 2009) based on Christaller's ideas (1935) on the hierarchy of places and the connection between urban *size* and the *position* in the hierarchy of each city from Zipf (1949). We know that only large cities are able to offer a full range of goods and services. If we only consider the linear distance to the main central place, the one ranking highest in Christaller's hierarchy, we somehow make a mistake by forgetting that certain goods and services are also offered in smaller and nearer urban places. One way of solving this problem is to define a set of *incremental distances* to each tier (*size* level) of urban areas. We first quantify the distance to the next tier, where some additional higher-order goods and services are produced, and then the *incremental distance* to the next higher urban tier, maybe a metropolitan area, where more higher-order services and urban amenities are provided. This idea is illustrated also on Figure 2.

FIGURE 2. SCHEMATIC REPRESENTATION OF THE CLASSIFICATION OF SPATIAL UNITS



From point A, b is the distance to the closer Urban LLM, and c is the distance to the Metropolitan LLM (the distance to the Metropolitan *LLM* is b+c, but –b, which is the distance already computed from A to the nearest Urban Area).
Source: Rubiera and Viñuela (2012) based on Partridge et al. (2008 and 2009).

The concept of *incremental distances*, suggested by Partridge et al. (2008 and 2009), brings together the effects of *distance* and large agglomerations: individuals and businesses need access to the higher-order services, urban amenities, higher qualified jobs and lower cost products that are only present in highly populated places due to the presence of strong agglomeration economies. Thus, we can measure the *distance* to a large agglomeration as a "penalty" to access the goods and services offered there.

Consequently, the mathematical way of introducing the *incremental distances* from LLM_i in the model considered would be: $\delta_{i-1}ID_{LLMi-1} + \delta_{i-2}ID_{LLMi-2} + \cdots + \delta_2 ID_{LLM2} + \delta_1 ID_{LLM1}$; were *ID* is the incremental distance from an *LLM* in tier *i* to the nearer *LLM* in each one of the higher tiers: LLM_1 for the biggest metropolitan areas; and LLM_2, LLM_3, … LLM_{i-1} for the rest or urban areas organized by *sizes*. These *incremental distances* discount the effect of being near an intermediate *LLM* that may offer some higher-order goods and services: inhabitants of the *LLM* considered do not have to travel necessarily to the further highest ranked *LLMs*, reducing the aforementioned penalty.

Although urbanization and centrality with regard to large metropolises may be the main *geo-structural* factor, other variables should be considered.

As Polèse (2009) said, *location* just by itself matters. This could be especially important if we take into consideration the influence of international markets. The position of a local area must be considered not only with regard to the national urban system, but also to the international connections. Proximity to some borders with important trade flows could be relevant. In order to capture this effect we propose, apart from the system of incremental distances, including the spatial position of each *LLM* using its longitude (*X*) and latitude (*Y*) coordinates.

In relation to the previous idea, proximity to the coast (*C*) gives a better position in terms of international trade because, as Hummels (1999) pointed out, it allows *door-to-door* shipping transportation, thus reducing costs. This is reinforced by the fact that airports in coastal cities are normally the most important gateways to international air connections. The coast also includes spaces with a greater propensity to develop a standard type of "sun and beach" tourism. Rappaport and Sachs (2003) studied the relevance of the coast in the US economy, finding clear correlations, not only with density, but also with productivity and growth.

A final equation proposed for estimation

All these variables may be synthesized into an expression such as the following:

$$G_{emp} = \alpha + [\beta_1 P] + \left[\gamma_1 Ed + \gamma_2 S + \gamma_3 S^2 + \gamma_3 I + \sum_{i=1}^{n} \gamma_4^i LQ_i\right] + +\delta_k C_k + [\rho_1 X + \rho_2 Y] + \left[\sum_{j=1}^{n} \varphi_1^j ID_{ij}\right] + \varepsilon_i \quad [3]$$

where *P* is the logarithm of the population, *E* is the percentage of population with university education in each *LLM*, *S* is the specialisation index obtained by applying expression (1) and *I* is a dummy variable that takes value 1 when the area is the capital city of a province or autonomous community. LQ_i are the location quotients calculated in all the areas for the selected sectors as presented in equation (2). *ID* is the *incremental distance* to the different tiers of *LLMs* considered (alternatively, we will use the linear distance to the nearest LLM1, allowing for comparison). *C* is a dummy variable that takes the value 1 when the *LLM* includes a coastal municipality, distinguishing between two different coastlines: Atlantic and Mediterranean. *X* and *Y* are the longitude and latitude coordinates. *Incremental distances* and coordinates use the centroid of each area (most important municipality of an *LLM* in terms of population) as the reference point.

3. TRANSLATING THE GENERAL APPROACH TO THE SPECIFIC CASE OF THE SPANISH ECONOMY

Delimitation and classification of the llms in spain

Administratively, Spain is divided into 8,106 municipalities that are aggregated into 50 provinces (NUTS III level), excluding Ceuta and Melilla; and seventeen Autonomous Communities or NUTS II regions (Figure 3 - Maps 2 and 3). The number of municipalities within each province ranges from 34 (Las Palmas) to 371 municipalities (Burgos). Furthermore, only for comparative purposes with other European member-states, the seventeen Autonomous Communities can be aggregated into seven statistical regions or NUTS I level (Figure 3, map 1), which have no real internal, political or administrative meaning.

FIGURE 3. SPANISH ADMINISTRATIVE DIVISION OF THE TERRITORY INTO NUTS I, AUTONOMOUS COMMUNITIES (NUTS II) AND PROVINCES (NUTS III)

Map 1: NUTS I regions | Map 2: Autonomous Communities or NUTS II regions | Map 3: Provinces or NUTS III regions

Using the 8,108 Spanish municipalities as base blocks, Boix and Galleto (2006) apply an algorithm of five stages. This process allows pointing out candidates to be the centre of an *LLM*, and gradually adding other municipalities it generates the 806 spatial conglomerates used in this study. There are two principles underlying the algorithm which make possible to talk about functional regions with economic sense: labour self-containment (a minimum of 75%) and commuting (a maximum of 25%). Therefore, Local Labour Markets integrate in the same unit the vast majority of labour and income movements, being regions with high internal homogeneity and, at the same time, high external heterogeneity (Rubiera and Viñuela, 2012). Figure 4 shows the 806 *LLMs* defined by Boix and Galleto (2006) for the Spanish case.

FIGURE 4. DIVISION OF SPANISH TERRITORY INTO LOCAL LABOUR MARKETS

Source: Boix et al.(2012).

After defining the local labour systems we can classify these basic spatial units, first according to *size* and then to *distance to size* as have been proposed in the previous section. Table 1 shows the distribution of Spanish *LLMs* by population *size* in Spain, where six tiers or levels are defined. The two first tiers, LLM_1 and LLM_2, correspond to the metropolitan areas or centre, to follow Christaller's nomenclature. Given the big gap in size between Madrid and Barcelona metropolitan areas and those classified as LLM_2 (with more than 500,000 but less than 2,500,000 inhabitants), we considered it appropriate to distinguish between these two levels. The next levels of lower urban areas; LLM_3, LLM_4 and LLM_5; basically include cities of more than 50,000 inhabitants but less than 500,000. Finally, those *LLMs* with less than 50.000 inhabitants are considered rural areas (LLM_6).

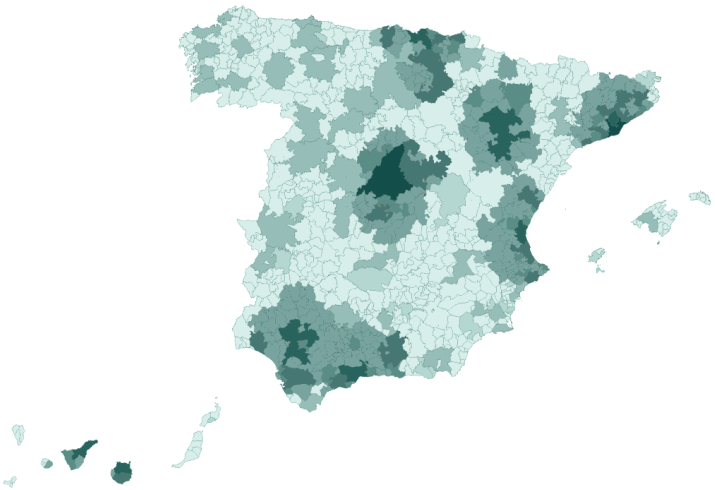
Incremental distances proposed by Partridge *et al.* could be applied to the *LLMs* of Table 1. Figure 5 shows central and peripheral *LLMs* according with a linear distance criterion. Nevertheless this is only an illustration of *distances*, for the empirical analysis a more precise matrix of *incremental distances* was built for each one the 806 *LLMs*.

TABLE 1. DISTRIBUTION OF LLMS BY POPULATION SIZE (1991)

	Number of LLM	*Number of municipalities*	*% of total population*
LLM1 > 2,500,000 inhabitants	*Madrid* *Barcelona*	*152* *51*	*20.58%*
2,500,000 inhabitants > ***LLM2*** > 500,000 inhabitants	*Valencia* *Sevilla* *Bilbao* *Zaragoza* *Malaga* *Palmas de Gran Canaria* *Sta. Cruz Tenerife*	*52* *39* *59* *95* *20* *15* *17*	*15.15%*
500,000 inhabitants > ***LLM3*** >250,000	*15 LLMs*	*377 municipalities*	*13.96%*
250,000 inhabitants > ***LLM4*** >100,000	*46 LLMs*	*1,741 municipalities*	*18.16%*
100,000 inhabitants > ***LLM5*** > 50,000 inhabitants	*43 LLMs*	*793 municipalities*	*7.23%*
LLM6 < 50,000 inhabitants	*693 LLMs*	*4,697 municipalities*	*24.92%*
TOTAL	***806 LLM***	***8,108 municipalities***	***38,871,359 inhabitants***

Source: Own elaboration with data from 1991 Spanish Census, published by INE (2007), and Boix and Galleto (2006)

FIGURE 5. SPANISH TERRITORY DIVISION BASED ON *LLMS*, *SIZE* AND *DISTANCE TO SIZE* (2001)



Source: Own elaboration with data from 2001 Spanish Census, published by INE (2007)

Databases: the spanish census and geographical references

One of the main problems in the application of this approach, represented by expression (3), is the major difficulty in obtaining suitable data for each variable. The data employed is summarised in Table 2.

TABLE 2. VARIABLES AND DATA USED IN THE EMPIRICAL APPROACH

Variables		Database
G_{emp}	Employment growth	Logarithmic growth rate of employment and population between 1991 and 2001 calculated using Spanish Census (1991 and 2001; data supplied by the Spanish National Institute of Statistics, INE).
P	Population logarithm	Logarithm of the population, taken from the 1991 Census (Spanish National Institute of Statistics, INE).
Ed	Educational level	Percentage of population with a university degree. Taken from the 1991 Census (Spanish National Institute of Statistics, INE).
I	Capital of province or Autonomous Community	Dummy variable that takes value 1 if the LLM contains a municipality that is capital of province or capital of Autonomous Community, and 0 otherwise.
S S^2	Specialisation index	Calculated using Equation (1) with data from the 1991 Spanish Census (Spanish National Institute of Statistics, INE).
LQ	Location quotient	Calculated using Equation (2) with data from the 1991 Spanish Census (Spanish National Institute of Statistics, INE).
AC MC	Cantabrian and North-Atlantic Coast Mediterranean and South-Atlantic Coast (including the islands)	Dummy variables that take value 1 if the LLM contains a coastal municipality, and 0 otherwise. This information was provided by the CNIG (Spanish National Centre for Geographical Research).
X	Longitude coordinate	Provided by the CNIG (Spanish National Centre for Geographical Research).
Y	Latitude coordinate	Provided by the CNIG (Spanish National Centre for Geographical Research).
LD_{LLM1} ---------- ID_{LLM1} ID_{LLM2} ID_{LLM3}	Linear distance, or alternatively, incremental distances	Linear distance to the highest-ranked LLM. Incremental Distances from a LLM to the nearer LLM in each higher tier according with classification of table 1. All the distances are calculated using the CNIG database (Spanish National Centre for Geographical Research). Digital maps of the Spanish territory.
Spatial unit of the analysis: Spanish Local Labour Markets		

The main database for the application of the empirical formulation proposed above is the Spanish Census, administered by the INE (National Statistics Institute of Spain). Although there are partial updates every three years, a comprehensive database is only available every ten years. The last two available Spanish censuses are for 1991 and 2001. We shall use the data from 1991 as the base year and compare it with the data from 2001.

The Census provides information about population, employment – divided into sixteen industrial classes (to calculate the dependent variable G_{emp} and the independent variables S and LQ) – and level of qualification of the workers in each area (to construct the variable E). To calculate the incremental distances (ID) we use data from the digital maps of the CNIG (Spanish National Centre for Geographical Research), which provide all the longitude (X) and latitude (Y) co-ordinates for Spanish municipalities, and information about the coastal condition of each municipality. All this information is aggregated using the LLM areas defined by Boix and Galleto (2006).

Estimation procedure: a proposal of a set of models

As the spatial units, concepts, distance measures and a set of real variables (subject to data availability) are delimited, the last issue is to decide on an estimate procedure to apply equation [3] to the Spanish case. Instead of using just one approach, we propose to estimate a set of different models that become increasingly more complex, from the simplest linear regressions to different approaches considering spatial auto-regressive processes. By these means we are able to measure and understand the contribution of separate sets of variables, which may help us to provide answers to the questions raised at the beginning of this study while bringing us closer to a final model that identifies the areas that grow faster in our framework.

We propose ten different models. The first two (A and B) aim to evaluate separately the local and policy-susceptible factors and the geographical factors, applying a simple linear estimation method. Comparing these two models, an evaluation of the extent of policies' influence can be obtained. The third model (C) is a combination of the previous ones, still using simple linear regression estimation. In the two following models (D and E) we incorporate the distance effect maintaining the same variables as before. *Model E* is the most complete in terms of variables included, so using this specification we introduce some changes in order to answer some other questions. First, we are interested in knowing whether growth in urban and rural areas can be explained

by the same factors or not. To that end, we divided the sample into two subsamples according to whether the LLMs were urban or rural. This is done in the two following models that are estimated by means of linear regression.

The following list pursues to make this succession of specifications clearer:

(i) *Model A:* local and policy-susceptible factors of Table 2 are considered.

(ii) *Model B:* geographical factors referred in Table 2.

(iii) *Model C:* aggregation of both sets of variables, local and policy-susceptible and geographical ones.

(iv) *Model D:* distance is introduced simply as linear distance to a *LLM1* (main metropolitan areas).

(v) *Model E:* more complex way of measuring distances, namely by *incremental distances* to *LLM1*, *LLM2* and *LLM3,* the three higher ranked regions in Spanish urban system in terms of population size.

(vi) *Model* E_U*:* same variables of *model E,* but only for the sample of places with more than 50.000 inhabitants (urban places).

(vii) *Model* E_R*:* same idea for rural areas with less than 50.000 inhabitants.

Finally, none of these models consider any spatial dependence in their specification. Anselin, (1988), Cliff and Ord (1981), Griffith (1988, 2003), Haining (1990) and Anselin *et al.* (2004) are some seminal works that proposed a way to consider and introduce the spatial auto-regressive processes. We apply three of these methods in our analysis using a proximity matrix *W,* calculated under the rule of "K neighbours contiguity" (for this analysis, we selected an order of 10):

(viii) *Model G* or *spatial lag* method, including the same variables of *Model E* but considering the influence of neighbours' employment growth and measuring its effect through a *Rho* parameter. We estimate equation [3] as in *model E*, but with WG_{emp} as a new explanatory variable.

(ix) In *Model F*, we introduce the spatial auto-regressive component in *model E* through a *spatial error* method, which allows the existence of spatial dependence in the error term of equation [3], split out from the "white noise" error through a *Lambda* parameter in the estimation.

(x) *Model H*, the spatial Durbin model, is a combination of the two previous ones, allowing for spatial dependence in the dependent and the independent variables at the same time, adding them as spatial lags in the specification.

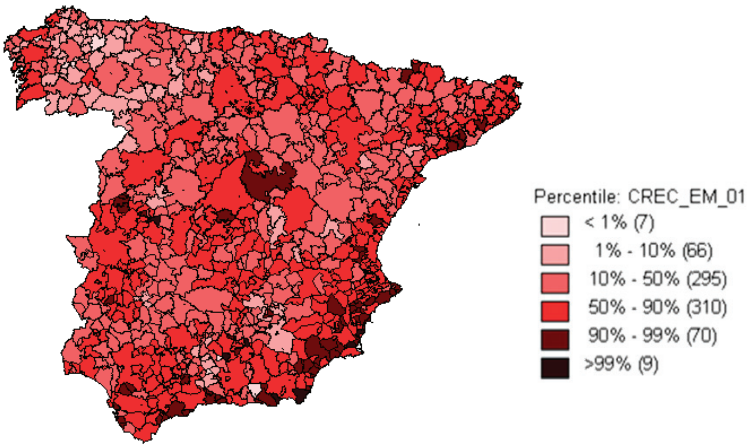
Analysing separately and comparing the results of the different estimations should give us some answers to the questions that motivate this research, and may lead us to create an profile of the regions that grow faster, which is our final goal.

4. MAIN RESULTS: GIVING SOME ANSWERS TO UNDERSTAND LOCAL EMPLOYMENT GROWTH IN THE SPANISH ECONOMY

First approach: basic models

Checking the available data on employment growth, some interesting patterns arise. Figure 6 shows the spatial distribution of employment growth in the Spanish LLMs separated by percentiles, and some trends can be already recognized in this basic information. The Mediterranean coast comprises many regions above the middle of the distribution, confirming its performance as a growth pole. Around Madrid and Barcelona there are also some growing areas. Other groups also appear in the North, West and South.

FIGURE 6. SPATIAL DISTRIBUTION OF LOGARITHMIC EMPLOYMENT GROWTH RATES (1991-2001) FOR SPANISH *LLMS*. PERCENTILE DIVISION



Source: Own elaboration with data from 2001 Spanish Census, published by INE (2007)

In sum, the location of faster growing areas does not seem to be arbitrary. Our aim is to uncover regularities that could characterize those areas, such as common features (political and geographical attributes) or certain relationships between them (spatial dependence). If the following regressions give robust results, it will be possible to

describe a growing area and to highlight the factors improving employment growth. Given the different attributes of the factors included, this can shed light on policy implications and the margin for maneuver.

In this section we estimate the ten models proposed at the end of the previous section, all referring to equation [3] that was discussed and explained in section 2. Tables 3, 4 and 5 present the results of these estimations.

TABLE 3. LOCAL EMPLOYMENT GROWTH ANALYSIS FOR THE SPANISH ECONOMY: GEOGRAPHICAL AND LOCAL FACTORS, WITH NO SPATIAL DEPENDENCE

Dependent variable: Logarithmic growth rate of employment (G_{emp})

		A Local	*B* Geography	*C* A+B	*D* C + Linear distance	*E* C+ Incremental distance
Constant		-0.065	0.184***	-0.140	-0.142	0.015
***P* (LOG Population)**		-0.017**		-0.018**	-0.019**	-0.007***
***Ed* (Education level)**		-5.492***		-1.297	-1.348	-1.432 *
***I* (Capital)**	**(1/0)**	0.006		0.026	0.027	0.030
***S* (Specialisation index)**		0.104**		0.085**	0.084**	0.086**
***S*² (sqr Specialisation index)**		-0.014***		-0.011***	-0.011***	-0.011***
LQ values						
LQ Manufacturing		0.001***		0.001***	0.001***	0.001***
LQ Construction		0.001***		0.001***	0.001***	0.001***
LQ Gov. related services		0.002***		0.001***	0.001***	0.001***
LQ Transport and storing		0.000		0.000**	0.000**	0.001**
LQ RS and business services		0.003***		0.001***	0.001***	0.001***
LQ Financial services		0.000		0.000	0.000	0.000
***AC* (Atlantic coastal)**	**(1/0)**		0.176***	0.125***	0.112***	0.133***
***MC* (Mediterranean c.)**	**(1/0)**		0.149***	0.117***	0.110***	0.099***
***X* (Longitude)**			-0.025***	-0.012***	-0.015***	-0.010***
***Y* (Latitude)**			0.039***	0.035***	0.034***	0.033***
LD_{LLM1}					0.011	
ID_{LLM1}						-0.006
ID_{LLM2}						-0.009
ID_{LLM3}						-0.028**
I-Moran						7.387***
Adjusted R²		0.318	0.342	0.458	0.459	0.486
F-Snedecor		32.989***	98.923***	43.512***	41.049***	36.756***

Note: local and spatially lagged variables are for 1991. The dependent variable, logarithm of the growth in employed population, is calculated over 1991-2001.

*/**/*** Significance at 10 / 5 /1% level. In F-Snedecor case is the global significance of the regression at the same levels.

Source: own from data summarized on table 2.

How relevant are geographical factors to local employment growth and how effective could political action be?

As can be observed by comparing models *A* and *B*, geographical variables without any additional information have almost the same explanatory capability as all the policy-susceptible variables. This shows that geographical characteristics are clearly relevant for understanding local employment growth. *Model C* includes all the variables from models *A* and *B*, and we focus our attention on the results obtained in this more complete estimation.

All the geographical variables are significant. As expected, the coast is clearly relevant: coastal *LLMs* grow faster than inland *LLMs*. Distinguishing between Mediterranean and Atlantic coastlines is also relevant: the *LLMs* of the Mediterranean coast grow faster than the *LLMs* of the Atlantic one, which can be explained by taking into account a climatology in the former which is more favourable towards the tourism industry. Longitude (*X)* and Latitude (*Y)* coordinates indicate that the territories located in the north-east of the country grow faster than the rest. This is the most developed urbanized area of the country, located close to the French and European border (commercial corridor).

Regarding the political variables, it can be seen that local economic structure is crucial to understand local employment growth as the level of specialization of the territory has a positive influence: the more specialized the territory, the faster the growth. Nevertheless, this effect tends to stabilize as shown by its decreasing growth rate. The coefficient of the *LQ* variables gives us some clues about which sectors are the best to specialize in. Manufacturing and Construction have a positive influence, as do Public Services and Business Services. Being a province or Autonomous Community capital city is not significant, but this effect may be being captured by Public Services *Location Quotient*.

Population (*P*) and Education (*E*) deserve a careful interpretation. In the case of Population the result is significant but negative, which indicates the presence of agglomeration diseconomies: the bigger the *LLM,* the higher the expulsion of employment. According to this result centrifugal forces are superior to centripetal ones, at least at a very local level. Concerning the Educational level, the estimation shows that it does not have a significant effect on local employment growth, or it is negative (as in the last model), which represents an unexpected result as this factor is one of the main

policy-susceptible variables and is usually related to a positive impact on growth. Some explanations for this phenomenon were given by Pritchett (2001), who states that the negative and significant effect of higher education may be due to (i) the creation of ill-directed cognitive skills, (ii) stronger growth of the supply than that of the demand of educated workers, or (iii) failure in the creation and transfer of knowledge. It is important to note that these effects vary greatly across countries, and even within the same country depending on the timeframe (Shearmur and Polèse, 2005).

Summarizing the results of this part of the study, it can be said that the profile of a successful local area in terms of growth corresponds with the territories located in the north-east of the country, especially along the coast, specialized in certain sectors like manufacturing, public or business services with high degrees of urbanization, but not especially the largest cities. These basic conclusions are maintained in the rest of the models, including those with spatial auto-regressive processes.

How important is the city size and how important is the distance to the largest cities?

The conclusions of *model C* about the population effect show that city size is not relevant to employment growth, having even a negative effect that may indicate some kind of crowding-out effect. This result is somewhat counterintuitive and deserves a deeper analysis.

Own size is probably not as important as being close to at least a minimum size city. We can check this using *models D* and *E*, which maintain all the variables of *C* while introducing linear distances (*model D*) and *incremental distances* (*model E*). The linear distance to LLM_1 is not significant, but using the *incremental distances* approach we can observe how relevant it is to be close to a minimum size area, at least an LLM_3 which facilitates access to basic goods and services.

These facts indicate that higher employment growth is found relatively close to a large urban area, but it is not necessary for the area under consideration to be itself a big city. Small or medium sized cities well located in relation to the main metropolis show a stronger tendency of grow faster.

TABLE 4. LOCAL EMPLOYMENT GROWTH ANALYSIS FOR THE SPANISH ECONOMY DISTINGUISHING BETWEEN RURAL AND URBAN AREAS

Dependent variable: Logarithmic growth rate of employment (G_{emp})

		E_R *Model E* with rural areas only	E_U *Model E* with urban areas only
Constant		-0.078	0.655**
***P* (LOG Population)**		-0.022**	-0.048**
***Ed* (Education level)**		-2.080**	-0.290
***I* (Capital)**	(1/0)		0.073*
***S* (Specialisation index)**		0.088*	0.042
***S²* (sqr Specialisation index)**		-0.012**	-0.006
LQ values			
LQ Manufacturing		0.001***	0.000
LQ Construction		0.001***	0.000
LQ Gov. related services		0.001***	-0.001
LQ Transport and storing		0.001***	-0.001
LQ RS and business services		0.001***	0.001**
LQ Financial services		0.001	0.001
***AC* (Atlantic coastal)**	(1/0)	0.128***	0.055
***MC* (Mediterranean c.)**	(1/0)	0.153***	0.054*
***X* (Longitude)**		-0.010***	-0.002
***Y* (Latitude)**		0.033***	0.031***
ID_{LLM1}		0.001	-0.017*
ID_{LLM2}		-0.013	0.004
ID_{LLM3}		-0.017***	-0.044
I-Moran		7.140***	1.794**
Adjusted R^2		0.454	0.398
F-Snedecor		32.831	4.818

Note: local and spatially lagged variables are for 1991. The dependent variable, logarithm of the growth in employed population, is calculated over 1991-2001.
*/**/*** Significance at 10 / 5 /1% level. In F-Snedecor case is the global significance of the regression at the same levels.
Source: own from data summarized on table 2.

Do the same factors have the same influence on the growth of urban and rural areas?

Another possible explanation of some counterintuitive effects observed in *Model E* is that our sample of places includes rural and urban areas. It is possible that different factors may be explaining employment growth in two environments that are so different. Therefore, in Table 4 the sample is split out into two groups, applying the same model for each one: *Model* E_U, for the sample of places with more than 50.000 inhabitants, and *Model* E_R, for the sample of places with less than 50.000 in inhabitants. The results are interesting and clarify the conclusions.

In urban areas, the model and the variables considered are less capable of explaining the employment growth process. This probably happens because these areas undergo

processes of endogenous growth and are thus less affected by the geographical and economic environment. The fact of being a capital city has a significant and positive effect on the dependant variable. The coastal condition- though only in the Mediterranean case - also appears relevant but with less significance. Finally, being near an LLM_1 raises the growth rate as it translates into complementarities with a bigger city that provides more diverse and higher quality goods and services.

Employment growth in rural areas, on the other hand, can be much more clearly explained with the selected variables. Employment growth relies strongly on specialization in different low level sectors such as Manufacturing, Construction, etc. All the geographical aspects have a strong impact: being on the Coast and located in the North favours employment growth, while being located in the West lessens it. Interestingly, for these small size areas it is enough to be located near medium-sized *LLMs* and not necessarily to a large city as occurs with the urban sample.

Some circumstances that deserve special attention are the roles of education and distance. With respect to the university education, our intuition is that its effect on general employment growth is biased by the effect on rural *LLMs* as it shows a highly negative and significant impact. With regard to distance, the differing criteria for urban and rural regions show that the effect of distance to size can vary depending on the size of the region under consideration.

Under these circumstances we may say that patterns of employment growth in rural Spain are different from those of urban Spain. A high level of qualification is relevant for rural areas, but it has a negative impact on employment growth. The effect of higher education does not seem to be relevant for urban areas. Geographical factors are crucial for rural or small places, but not that important for urban areas. An interesting finding is that the size reference changes: in rural areas it is enough to be close to a small-medium region, while the successful urban areas in terms of employment growth are close to a large metropolis.

TABLE 5. LOCAL EMPLOYMENT GROWTH ANALYSIS FOR THE SPANISH ECONOMY: GEOGRAPHICAL AND LOCAL FACTORS, WITH SPATIAL DEPENDENCE

Dependent variable: Logarithmic growth rate of employment (Gemp)

		F	*G*	*H*	
		Spatial Lag Model	Spatial Error Model	Spatial Durbin Model	
				Factor	Spatial Lag
Constant		-0.106	-0.055	0.298	-
Rho		0.508***	-	0.530***	-
Lambda		-	0.573***	-	-
***P* (LOG Population)**		-0.015**	-0.013*	-0.014	-0.025
***Ed* (Education level)**		-1.456**	-1.927**	-2.061**	1.031
***I* (Capital)**	(1/0)	0.040	0.035	0.039	-0.039
***S* (Specialisation index)**		0.072**	0.076**	0.068**	-0.071
***S*² (sqr Specialisation index)**		-0.009**	-0.009***	-0.009**	0.005
LQ values					
LQ Manufacturing		0.001***	0.001***	0.001***	0.000
LQ Construction		0.001***	0.001***	0.001***	0.001**
LQ Gov. related services		0.001**	0.001***	0.001***	0.001
LQ Transport and storing		0.000**	0.001**	0.001**	0.000
LQ RS and business services		0.001***	0.001***	0.001***	0.001
LQ Financial services		0.000	0.000	0.000	0.000
***AC* (Atlantic coastal)**	(1/0)	0.096***	0.124***	0.131***	-0.045
***MC* (Mediterranean c.)**	(1/0)	0.082***	0.102***	0.075***	-0.025
***X* (Longitude)**		-0.003	-0.016***	0.017	-0.015
***Y* (Latitude)**		0.016***	0.035***	0.145***	-0.125**
ID_{LLM1}		-0.007	-0.008	-0.012	0.010
ID_{LLM2}		-0.002	-0.002	0.003	-0.002
ID_{LLM3}		-0.025*	-0.046**	-0.059	0.057
Lagrange Multiplier		155.840***	164.825***		
Robust Lagrange Multiplier		10.233***	19.218***		
Likelihood Ratio Test		98.197***	99.101***	80.493***	
AIC		-781.13	-782.04	-764.97	

Note: local and spatially lagged variables are for 1991. The dependent variable, logarithm of the growth in employed population, is calculated over 1991-2001.
The W contiguity matrix was calculated using the K-neighbours proximity rule (order 10).
Source: own from data summarized in Table 2.

How relevant is the regional economic environment to local growth?

This last question is partly answered in terms of geographical position. To be more precise, the question that we are interested in answering is how important is the employment growth and the evolution of the characteristics of the neighbouring regions to the local behaviour. Or, in econometric terms, how relevant are the spatial auto-regressive processes.

Models G and *F* reproduce *Model E*, using the complete sample (urban and rural) but with a spatial lag approach in *Model G*, spatial error method in *Model F*, and spatial Durbin method in *Model H*. The application of these methods is justified by the values obtained in the I-Moran test in the previous regressions that reject the null hypothesis of

random spatial distribution of the dependant variable and corroborate the existence of spatial autocorrelation. Furthermore, the significance of the Lagrange Multipliers and their robust versions justify the estimation of the Durbin model. As expected, the results show the relevance of the behaviour of the neighbours.

In the *spatial lag* model the dependent variable is introduced also as an explanatory term weighted by the *W* "k-neighbours" contiguity matrix of order 10. Its effect is significant and positive, leading to the conclusion that the employment growth of surrounding regions enhance own employment growth. In the *spatial error* model, the Lambda parameter which informs about the neighbouring independent variables also has a significant and positive value. This means that the omission of relevant variables, namely spatial lags of the explanatory factors, results in a spatially autocorrelated error term. This effect highlights the connection between employment growth and the features of neighbouring areas. The remaining variables maintain their significance in the same terms as the preceding models. In the spatial Durbin model both of the previous effects are included: on the one hand there is the spatially lagged dependent variable, and on the other hand there are the lags of the explanatory factors. The significance is almost the same for the variables shared with the other spatial models. If we have to choose one of these three models, the Spatial Error model seems to explain better the territorial dependence according to the likelihood ratio test (highest value), the Akaike information criterion (lowest value) and the Lagrange multipliers (highest value).

Thus, apart from the different factors considered throughout this chapter, we can clearly conclude that local area employment growth strongly depends on neighbours' employment growth and features.

5. SO, WHAT PLACES GROW FASTER IN SPAIN? MAIN CONCLUSIONS.

The aim of the analysis developed here was to shed some light on the processes underlying local employment growth in Spain. As there is no GDP data for the territorial level considered, the study of employment growth was proposed as a means of obtaining some clues concerning local growth as a whole. Spanish Local Labour Markets served as basic spatial units, and data from the Spanish Censuses of 1991 and 2001, and from the Spanish National Centre for Geographical Research were used to estimate of the empirical model proposed. The specification has a logarithmic employment growth rate as the dependent variable, including a compendium of policy-

susceptible and geographical variables as explanatory terms. To account for the distance to bigger regions, we used incremental distances as an alternative to the traditional linear approach. We estimated ten models of increasing complexity: the first five consisted of simple linear regressions (gradually adding variables), the following two are versions of the most complete of the previous specifications for rural and urban subsamples, and the last three are estimated using spatial econometric methods which account for the impact of the surrounding areas.

When considered separately, policy-susceptible variables and geographical factors have similar explanatory power. It shows that policies may be effective in stimulating employment growth to some extent, but a comparable part of the growth comes from features that cannot be affected by political decisions, namely, the geographical characteristics of an area. The geographical terms are significant, highlighting the importance of being located near the European commercial corridor (north-east) and on the coasts (especially the Mediterranean). Regarding policy-susceptible variables, our results point to the importance of the industrial structure: being a specialized economy has a positive effect on employment growth, and sectors such as Manufacturing, Construction, Public Services and Business Services enhance this effect. The negative effect of the educational level is unexpected, but it can be explained when the sample is divided into urban and rural regions.

Population has a negative impact that may be due to agglomeration diseconomies, leading to possible employment expulsion favouring medium size regions. It means that size by itself does not translate into employment growth. The key role in this case is played by the size of the neighbours and the distance to the different size tiers defined, which is captured by incremental distances. The results show that it is important for employment growth to be near minimum size regions (LLM_3) where some higher level goods and services of are provided.

When the estimation is carried out separately for urban and rural areas, it is shown that the model proposed fits the rural case better. It seems that urban areas follow a path of endogenous growth affected only by its own size and the capital condition of the city. Real Estate and Business Services sectors enhance employment growth in these regions, as happens by being located north or in the Mediterranean littoral. For the rural areas, all the policy-susceptible and geographical variables have a significant impact. The negative effect of the educational level in the rural case is noteworthy and may be biasing the results of the estimations for the complete sample, and may serve as an

explanation for the unexpected previous outcome. These two kinds of area also differ in terms of the effect of distance-to-size: urban areas benefit from being located near the biggest cities, while rural ones are better near medium size regions in terms of employment growth.

Spatial dependence tests confirm our thoughts about the significance of location since the territorial distribution of employment growth does not seem to be random. The Spatial Lag estimation asserts the positive relationship between own employment growth and the employment growth of neighbouring regions, while the Spatial Error estimation highlights the relevance of the characteristics of neighbours. In the Spatial Durbin estimation some of these ideas are supported, especially those related to the Spatial Lag specification, as very few lagged explanatory variables turn out to be relevant.

In light of the results obtained from this analysis, answers can be formulated for the question that motivates our research, namely *What places grow faster?* The profile of a successful region in terms of employment growth would be represented by an area located in the north-east, preferably on the coast, with a specialized economy and located near actively growing areas. For urban areas, specialization in Real Estate and Business Services sectors and being near a big region intensifies employment growth. Rural areas perform better when specializing in basic sectors and located near medium-small size regions. Own population and high educational level do not seem to improve employment growth.

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