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## **Enterprise creation at a local scale: determining factors in the case of municipalities in Castilla y León**

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### **Abstract**

The behaviour of enterprises in terms of their spatial distribution is increasingly drawing the attention of regional science, due to the fact that regional economic development is the result of the complex interaction of various factors, key amongst which is entrepreneurial demography. Yet, as the Organisation for Economic Co-operation and Development has recognised, few empirical studies have addressed the link between new enterprises and economic change at a local scale, despite entrepreneurs constituting one means of creating employment and increasing local community wealth.

Within this context, this paper pinpoints those factors that determine the birth of new enterprises at a local scale, focusing on towns in the Spanish Autonomous Region of Castilla y León. The information used was gathered from the approximately 15 000 companies set up between 2001 and 2003 in the 270 towns with over 1 000 inhabitants in the region, and whose creation as a company was published in the Official Journal of the Business Register Office. The approach used is based on the link between entrepreneurial capacity and regional economic growth, prior to an analysis of regional differences in the setting up of companies within the Spanish economy. Subsequently, a detailed analysis is made of the factors that influence the creation of new enterprises in towns in Castilla y León, through the use of a regression model which, amongst other conclusions, attributes the emergence of enterprises to a large extent to the presence of agglomeration economies and urban growth.

JEL: M13 (Entrepreneurship), R11 (Regional Economic Activity: Growth, Development, and Changes)

Keywords: entrepreneurship, enterprise creation, local economic development, Castilla y León, Spain

## 1. Introduction: creation of firms, economic growth and employment

Any approach to the relationship between the birth of companies and economic growth must take into account that the capacity for entrepreneurship is a multidimensional phenomena<sup>1</sup> and that the difficulty inherent in any definition or measure of the spread of entrepreneurial activities affects the analysis of its impact on economic growth. Both elements entail linking individual to other factors. We thus need to offer a clear definition of the figure of the entrepreneur.

Without going into too much detail<sup>2</sup>, as a reference point we may take the contribution of Wennekers and Thurik (1999) when they define the *entrepreneur* as “*an individual with the manifest ability and willingness to perceive and create financial opportunities (new products, new production methods, new organisational schemes and new product-market combinations, on their own or in teams, within and outside of existing organisations and to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location and use of resources and institutions*”.

From the point of view of regional analysis, the figure of the entrepreneur must be linked to the study of factors affecting both the creation of enterprises as well as their success<sup>3</sup>. Table 1 provides a summary of those determining factors which most frequently appear in economic literature and which may be split into two kinds: personal and external. In turn, within those factors which may affect success may also be distinguished: elements linked to the entrepreneur, elements linked to the business project and other external considerations.

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<sup>1</sup> McQuaid (2004), points to the existence of varying viewpoints linked to the concept of the entrepreneur. The entrepreneur as a function within the economy; the entrepreneur as creator of a new firm; the entrepreneur as the owner of a small and medium enterprise; the entrepreneur as a set of personal characteristics; and finally, the entrepreneur as a mode of conduct.

<sup>2</sup> An exhaustive review of the figure of the entrepreneur in economic literature may be found in Nijkamp (2003).

<sup>3</sup> One issue which is yet to be satisfactorily resolved is exactly how the success of a firm may be measured. By way of an example to indicate success, Veronique et al. (2000, p.149) use the growth of company activity in the three years following its birth, verifying the results with an additional indicator, namely profit levels once this three-year period is over.

**Table 1. Determining factors in company creation and success**

Factors affecting company creation	Personal factors	<ul style="list-style-type: none"> <li>• The need to achieve objectives.</li> <li>• Internal control.</li> <li>• Tolerating ambiguity and the ability to take risks.</li> <li>• Focusing on opportunity.</li> <li>• Strong commitment.</li> <li>• Lack of satisfaction as a wage earner.</li> <li>• Personal conviction.</li> <li>• Training.</li> <li>• Family and social milieu.</li> <li>• Age.</li> <li>• Setting up a management team.</li> <li>• Fear of personal failure and failure of the business.</li> <li>• Ability to raise capital.</li> </ul>
	External factors	<ul style="list-style-type: none"> <li>• Economies of location.</li> <li>• Economies of urbanisation.</li> <li>• The financial climate.</li> <li>• Intervention and economic regulation.</li> <li>• The economic climate.</li> <li>• Social capital.</li> <li>• The entrepreneurial culture of society.</li> <li>• Regional research/innovative capacity.</li> <li>• Sectorial structure of economic activity.</li> <li>• Population shift and immigration.</li> <li>• Enterprise structure by size of enterprise.</li> </ul>
Factors influencing company success	Factors linked to the entrepreneur	<ul style="list-style-type: none"> <li>• Previous experience.</li> <li>• Management skills.</li> <li>• Existence of <i>partners</i>.</li> </ul>
	Factors linked to the enterprise	<ul style="list-style-type: none"> <li>• Size of the enterprise.</li> <li>• Existence of previous preparation.</li> <li>• Support through information and guidance.</li> <li>• Nature of the sector involved.</li> </ul>
	External factors	<ul style="list-style-type: none"> <li>• Agglomeration economies.</li> <li>• Urbanisation economies.</li> <li>• Availability of space.</li> <li>• Density of infrastructure.</li> <li>• Accessibility.</li> </ul>

Source: drawn from Aguado et al (2002), Armington and Acs (2001), Audretsch and Fritsch (1994), Bade and Nerlinger (2000), Capello (2002), Davidsson et al (1994), European Commission (2003), Fernández y Junquera (2001), Georgellis and Wall (2000), Inter-American Development Bank (2002), Kangasharju (2000), Keeble and Walker (1993), OECD (2003), Putman (1993), Wagner and Sternberg (2004), Wever (1984), Van Praag (1996), Word (1997), Nerlinger (1998), Veronique et al. (2000), Stuart (1990), Storey (1994).

The effects of entrepreneurship on growth have been analysed empirically from different standpoints:

- *Effect of irregular fluctuation on economic growth.* These studies consider that the number of companies entering and leaving industry or regions may be seen as an indicator of entrepreneurial activity. Various authors have pinpointed a link between enterprise creation and macroeconomic development: Reynolds (1999) for the United States, Audrescth and Fritsch (2002) for Germany or Fölster (2000) for Sweden.

- *Effect of change in the structure of existing SMEs on economic growth.* In relative terms, a higher number of SMEs in one region than in another may be viewed as an indicator of greater entrepreneurial activity (Caree and Thurik, 1999).
- *Effect of the number of competitors involved in a sector on economic growth.* Nickell, Nicolistas and Dryden (1997) highlight the importance of the increase in the number of competitors on productivity. Any such increase may be linked to greater entrepreneurial activity.
- *Effect of self-employment on economic growth.* If we accept that many new enterprises, prior to subsequent development, tend to emerge from self-employment where no other employees are involved, in developed economies the rate of self-employment might reasonably be expected to be linked to the rate of entrepreneurial activity. However, this has yet to be fully confirmed (Blanchflower, 2000) and has even been contested (Carree et al., 2002).

With regard to the link between entrepreneurship and employment, certain studies point to a positive relation between the two variables (Reynolds, 1994; Davidson et al., 1994; Aschroft and Love, 1996). Yet, this link is by no means easy to appreciate due to the way the market works (OECD, 2003)<sup>4</sup>. What has been highlighted is the growing importance of SMEs in the creation of employment, a trend common to many countries.

Based on these initial considerations, this paper is aimed at identifying the most relevant factors which account for the birth of new enterprises in municipalities in Castilla y León, through the use of statistical techniques. Given that the creation of new enterprises is not oblivious to the milieu in which it occurs, a brief overview is firstly offered of the main features of the entrepreneurial fabric of Spain and Castilla y León, as this is where new companies will be conducting their business activity, no doubt influencing their birth and future characteristics. A detailed insight is then given of the entrepreneurial demography of the Castilla y León economy from a municipal standpoint, between 2000 and 2003. The conclusions obtained, while relevant for formulating policies which might foster entrepreneurship, should be treated with caution, due to the scarce data and limited statistical sources available at a municipal scale.

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<sup>4</sup> Among the factors highlighted by the OECD (2003) as problematic when linking entrepreneurship and employment are: that causality works in two directions; statistics may hide information due to deficiencies when reflecting microenterprises; and the sectorial nature of the creation of companies.

## 2. Entrepreneurial fabric in Spain and in Castilla y León

According to the Central Business Register (DIRCE), the number of firms active in Spain on 1st January 2004 amounted to 2 942 583 with a high concentration of activity in the service sector<sup>5</sup>, mainly in the section *Other services* (50.2%), this concentration tending to increase since 1996.

At a greater distance from the tertiary sector are industrial enterprises and *Construction*. The industrial sector, besides accounting for the lowest number of firms in 2004 (8.4%) has shown a downward trend since 1996, a trend which may be applied to all areas of industry, with the exception of *Energy and water*, which have shown a slight improvement. The bulk of the industrial sector is made up of companies involved in activities considered to be traditional and longstanding<sup>6</sup>, although none of these activities accounts for more than 1.6% of the total number of firms operational in Spain.

The geographical distribution of firms in Spain (Figure 1) reveals how Cataluña is the Autonomous Community with the greatest weight (18.5% of the national total), followed by Andalucía (15.0%), Madrid (14,8%) and la Comunidad Valenciana (10.7%). The creation and disappearance of firms in recent years has hardly affected territorial distribution.

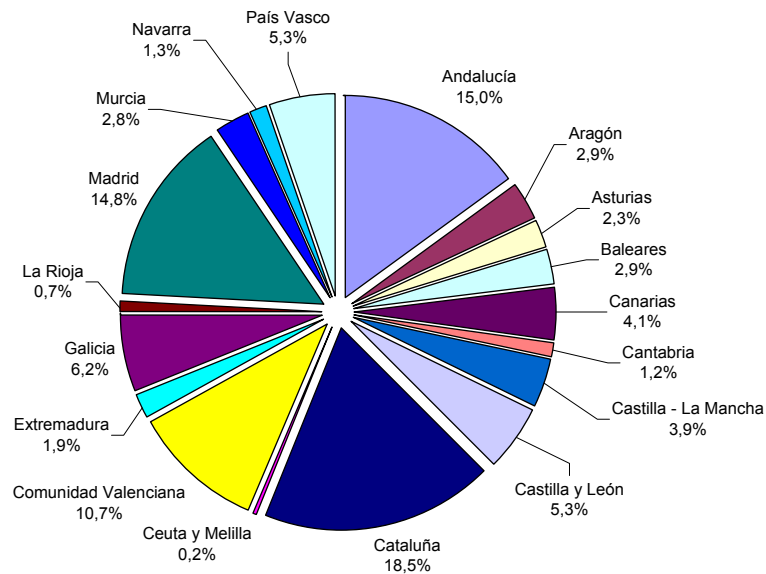
In order to establish comparisons among the various Autonomous Communities, the number of companies has been weighted with the population in each of the Spanish regions. In this case, the previous results undergo certain changes, with regions such as Baleares (80.2), Cataluña (78.4), País Vasco (73.2), Madrid (71.3) and La Rioja (69.9) prominent. Generally speaking, regions with low entrepreneurial density are those which show a lower GDP per capita, although a process of entrepreneurial convergence can be seen in these regions, as they are growing above the national average.

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<sup>5</sup> In this paper, the Service sector is analysed in two large separate groups of activities: *Shops and repairs* and *Other services*. The latter group of activities is made up of: *Hotel and catering industry; Transport, storage and communications; Financial Intermediation; Real estate and services to companies; Education, health and other services*.

<sup>6</sup> *Metallurgical industry and manufacturing of metal products, textile industry, leather and shoe industry, food, drink and tobacco, various manufacturing industries and Paper, graphic arts and reproduction of recorded material*.

**Figure 1. Territorial distribution of Spanish firms in 2004**



Source: taken from the DIRCE. INE.

The sectorial structure in the Autonomous Communities is similar, although in each area the sectors considered show a different specific weight (Table 2). The sector *Other services* accounts for over 58% of economic activities in Madrid, yet is below 41% of firms in Castilla-La Mancha. At the opposite end of the scale, *Industry*, which is the least relevant sector in the whole of the country, ranges between 13.7% of firms in La Rioja and 5.2% of those in Canarias.

**Table 2. Sectorial distribution of firms in the Autonomous Communities in 2004**

Community	Industry	Construction	Shops and repair services	Other services	Total
Andalucía	7.4%	10.7%	32.4%	49.5%	100.0%
Aragón	9.5%	15.3%	26.8%	48.4%	100.0%
Asturias	6.6%	13.1%	28.4%	52.0%	100.0%
Baleares	6.5%	16.1%	25.4%	52.1%	100.0%
Canarias	5.2%	11.7%	29.7%	53.4%	100.0%
Cantabria	6.7%	14.4%	27.1%	51.7%	100.0%
Castilla - La Mancha	11.5%	17.4%	30.1%	40.9%	100.0%
Castilla y León	8.3%	15.9%	29.1%	46.7%	100.0%
Cataluña	9.9%	13.7%	26.1%	50.3%	100.0%
Ceuta y Melilla	2.4%	7.3%	45.9%	44.4%	100.0%
Comunidad Valenciana	9.9%	13.0%	29.1%	48.0%	100.0%
Extremadura	8.7%	13.6%	34.7%	43.0%	100.0%
Galicia	8.3%	14.0%	30.3%	47.4%	100.0%
La Rioja	13.7%	14.2%	28.6%	43.4%	100.0%
Madrid	6.3%	12.0%	23.3%	58.3%	100.0%
Murcia	9.4%	14.4%	30.6%	45.6%	100.0%
Navarra	10.3%	15.2%	26.0%	48.4%	100.0%
País Vasco	9.7%	14.6%	25.5%	50.3%	100.0%
<i>Spain</i>	<i>8.4%</i>	<i>13.3%</i>	<i>28.1%</i>	<i>50.2%</i>	<i>100.0%</i>

Source: taken from the DIRCE. INE.

The link between the distribution of entrepreneurial activity by sectors in each region and that which exists in the whole of Spain<sup>7</sup>, enables us to classify Autonomous Communities in terms of entrepreneurial specialisation<sup>8</sup> into four categories:

- **Regions specialising in *Industrial* activities:** Castilla-La Mancha, Cataluña, Comunidad, Valenciana, La Rioja, Murcia, Navarra and País Vasco.
- **Regions specialising in *Construction*:** Aragón, Baleares, Cantabria and Castilla y León.
- **Regions specialising in *Commerce and repair services*:** Andalucía, Ceuta y Melilla, Extremadura and Galicia.
- **Regions specialising in *Other services*:** Asturias, Canarias and Madrid.

<sup>7</sup> Specialisation index is defined as:

$$S_{ij} = \frac{N_{i,j} / N_j}{N_{i,SP} / N_{SP}} = \frac{\% \text{ of firms in sector } i \text{ in Autonomous Community } j}{\% \text{ of firms in sector } i \text{ in Spain}}$$

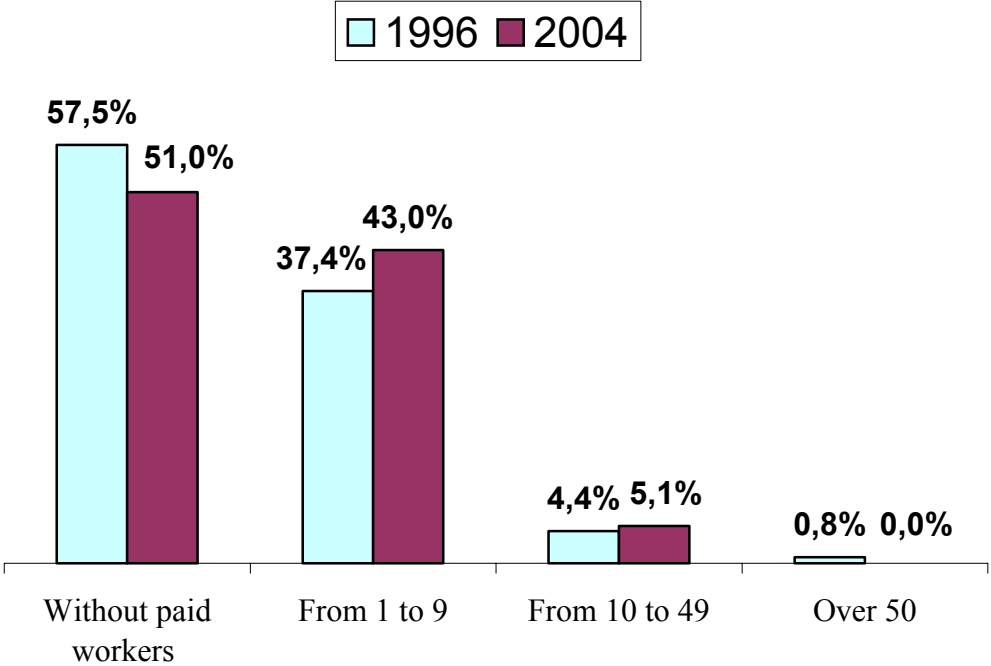
where: subscript i is the economic sector; subscript j is the Autonomous Community, SP represents the whole of Spain (SP), and N denotes the number of firms. Values above 1 indicate density of activity i in the region above the average density at a national scale, whereas values below 1 mean that the activity i has a lower presence in the region.

<sup>8</sup> No significant changes were apparent between 1996-2004. In fact the three activities showing the highest index of specialisation have not varied in the eight regions. For the remainder, only the third in order of importance has changed.



The prevalence of tertiary activities, mentioned previously, has to do with the small company size. Figure 2 shows the clear dominance of SMEs. Firms without paid workers or with fewer than nine workers accounted for 94% of the total number of firms in Spain in 2004. This figure has hardly changed since 1996. By contrast, a fall of 6.5% can be seen in the number of firms with no paid workers and an increase of 5.6% in those with fewer than nine workers.

**Figure 2. Distribution by size of Spanish firms**



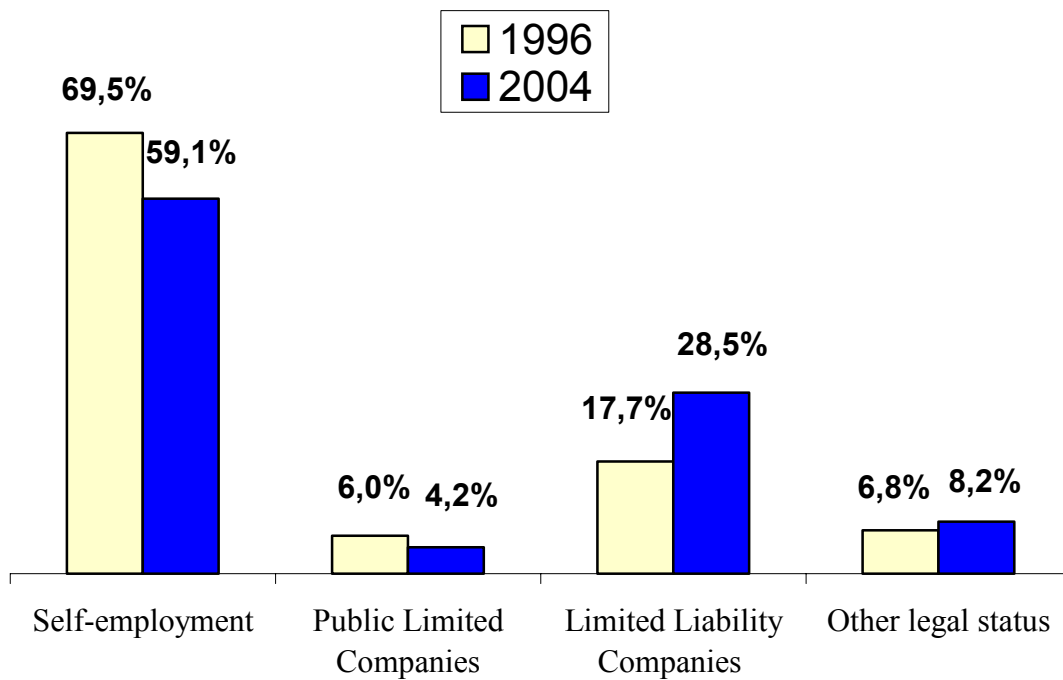
Source: taken from the DIRCE. INE.

However, an analysis of the factors determining the birth of firms reveals that in 29.2% of cases, new companies are set up with fewer than ten hired workers, and in 68.5% of cases without any. The industrial sector accounts for greatest weight in terms of the number of companies starting out with a paid worker (47.5%). By contrast, in *Other services* only 27.7% of the firms appearing on the market do so with a paid worker<sup>9</sup>.

Together with the prevalence of microenterprises in Spanish entrepreneurial fabric, the importance of Partnerships should also be highlighted, although there is a certain trend towards their disappearance in favour of Limited Liability Companies (Figure 3). In this context, of particular note is the limited weight of Public Limited Companies, which account for barely more than 4% of firms operational in 2004, even lower than the 6% figure of 1996.

<sup>9</sup> Note the contrast between *Chemical* and *Rubber and plastics* where the percentage of new firms with paid workers is 60% and *Financial Intermediation* where the percentage scarcely rises above 14%.

**Figure 3. Distribution of the number of Spanish firms by legal status**



Source: taken from the DIRCE. INE.

With regard to this point, the close link between the size of a company and its legal status cannot be neglected: 68% of *partnerships* have no paid workers (single entrepreneurs), 65% of *limited liability companies* employ between one and nine people and 39% of *public limited companies* are firms employing over nine workers<sup>10</sup>.

Focusing the analysis on the Autonomous Community of Castilla y León, it should be borne in mind that only 5.3% of Spanish firms in 2004 set up their business in this Community, a high territorial concentration also being evident. In fact, 40% of these 155 004 companies conduct their business activity in only two of its nine provinces: Valladolid and León. In general terms, firms in Castilla y León display the following characteristics:

- The sectorial structure of firms is similar to the country as a whole (Table 1), with a notable prevalence of the *Service* sector (75.8%), followed by *Construction* (15.9%) and *Industry* (8.3%). In this latter sector, the importance of traditional and longstanding activities is worthy of note, above all in, *food, drink and tobacco* and the *automotive*

<sup>10</sup> There is also a link between the sector of activity in which the company is involved and its legal status: in *Industry* limited liability companies stand out (43%) as do partnerships (37%); in *Construction*, partnerships form the main group (41%) together with public limited companies (34%); in *Commerce and repairs* public limited companies form the main group (53%) with limited liability companies (40%); finally, in *Other services*, limited liability companies are prominent (41%) together with other legal statuses (46%).

*industry*. Whatever the case, what is significant is the high level of heterogeneity in firms' productive specialisation at a provincial scale.

- Density of firms (61 firms per one thousand inhabitants) is slightly lower than the national average, although a sharp increase has been recorded in recent years, partially due to the region's loss of population.
- A more noticeable presence of microenterprises than in the rest of Spain: 52.2% employ no paid workers, 43% employ between one and nine workers and only 4.8% employ over nine workers, although a slow reduction has been seen in the first of the groups.
- In line with what has just been mentioned, there is a prevalence of Self-employment (sole-trade or partnership) (64.8%), although a loss in their relative importance can be observed between 1996-2004 in favour of *limited liability companies (llcs)* and *public limited companies (pcls)*. Companies without any partnership involvement are more common in those provinces in which entrepreneurial activity is lowest (Ávila and Zamora), whereas *public limited companies* and *limited liability companies* are mainly to be found in Valladolid and León.

### **3. The birth of new firms in municipalities in Castilla y León**

The 15 740 firms created between 2000 and 2003 in Castilla y León were located in 1 087 municipalities. In other words, in 51.7% of the region's municipalities no companies involving partners were created during the period analysed (Figure 4)<sup>11</sup>. Moreover, there is a high geographic concentration since in only 32 towns and cities were over 50 new businesses set up and in only seven did the number of firms born exceed 500. In more specific terms, we were also able to detect:

- The importance of provincial capitals as focal points for the creation of new enterprises. For instance, in Valladolid and Palencia the capital accounted for 66.2% and 63.7%, respectively of the total for the province.

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<sup>11</sup> This fact is particularly striking in the provinces of Soria and Palencia, where the percentage of municipalities bereft of the birth of any company reached 66.3% and 60.7%, respectively. These results should not be put down to the large number of municipalities, as in fact these provinces have the lowest number of towns and villages in the Community. At the other end of the scale, only 24.5% of towns in the province of León failed to witness the birth of any new enterprise.

- A significant correlation between the size of the population in the municipalities and the birth of businesses.
- A positive relation between the companies set up in each municipality and disposable family income per inhabitant in the town and, particularly, purchasing power in the towns.

In an effort to gain a greater understanding of the creation of companies at a local scale we analysed the possible link between the birth of firms and the characteristics of the municipalities in which they were set up in the four-year period 2000-2003. This analysis was hindered by the total lack of data relative to the birth of all kinds of new companies at a local level. As a result we were forced to resort to the original data published in the Official Journal of the Business Register (BORME)<sup>12</sup>, as our source of information concerning company births, although this register does not cover each and every possibility in terms of legal status of companies<sup>13</sup>. As we were unable to obtain official statistics encompassing all the municipalities within the region either, for our main source of municipal information we turned to the Economic and Social Reports, issued by the Service for Studies at the Caixa Savings Bank. We were forced to restrict our analysis to municipalities of over 1 000 inhabitants. Although in 2003, these made up only 17% of the total number existing in Castilla y León, they accounted for 95% of new companies involving partners.

Using the factors normally found in economic literature to try to explain company birth, already summarised and reflected in Table 1, and given the serious statistical restrictions previously outlined, the following variables have been used as a starting point to explain the birth of firms: *New companies, Population, Percentage of unemployed over population, Economic level, Industrial index, Industrial activities, Immigration, Percentage of house owners, University graduates, Market share, Level of unemployment, Provincial capital, Distance from provincial capital, Distance from Madrid, Population density, Main town in the area, Main town in sub-area, Industrial activities per km<sup>2</sup>* (ANNEX). Although the year analysed was 2003, given that for certain variables, as is shown in the annex, the relevant information was not available, we opted to use data from the previous year.

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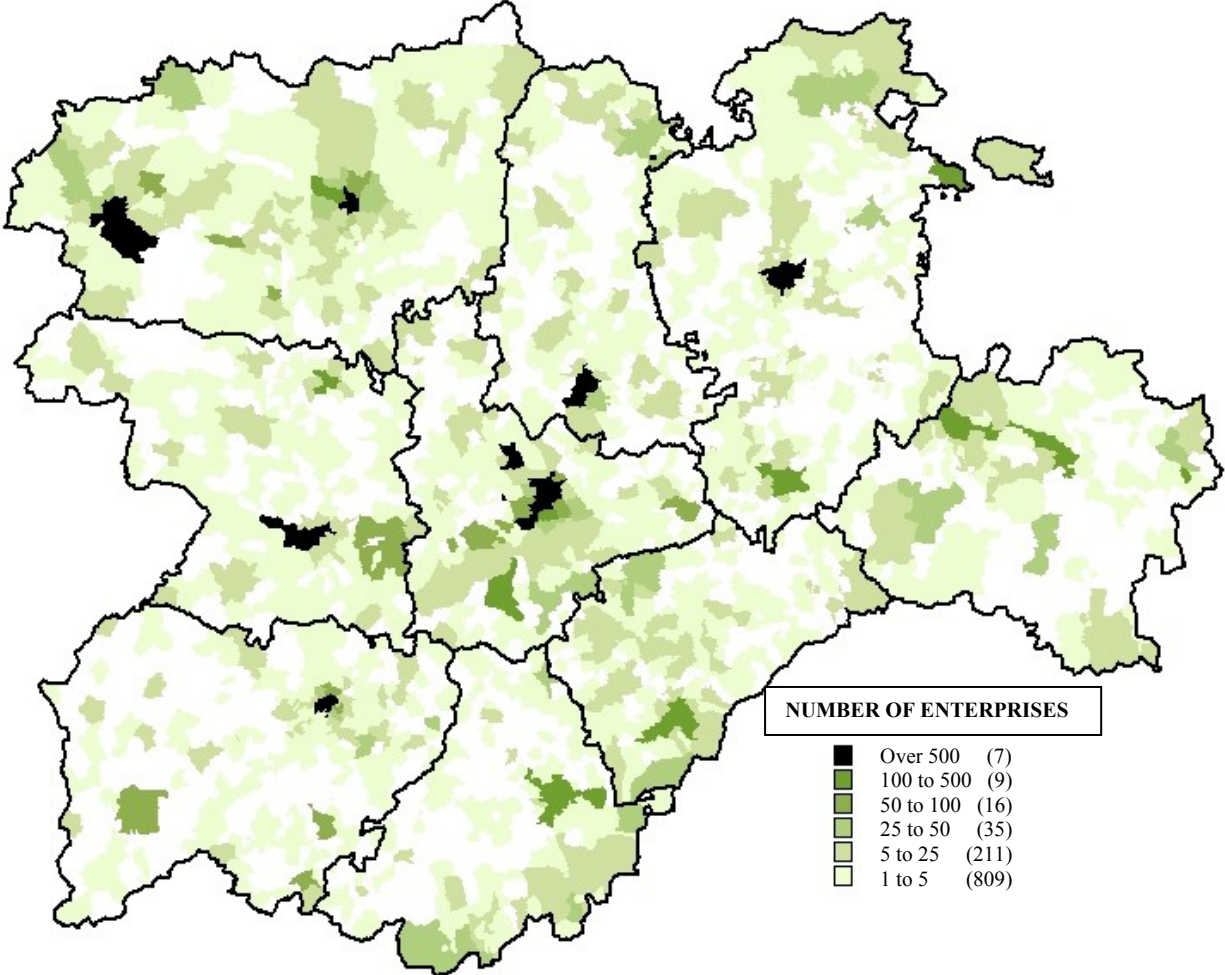
<sup>12</sup> The information has been gathered from the 994 reports published daily between 3 January 2000 until 31 December 2003. This has enabled us to set up a database of new firms spread evenly over the period.

<sup>13</sup> They are basically limited liabilities companies, being the most relevant are the *limited liability companies (lles)* and *public limited companies (pcls)*.

From the data mentioned, an initial step was to analyse the lineal and partial correlations of the variables used. Table 3 shows the (Pearson) lineal correlation coefficients among all of them, with the exception of nominals (*Provincial capitals*, *Bordering on the capital*, *Close to Madrid*, *Main town in area* and *Main town in sub-area*), together with the significance contrasts of these coefficients.

This initial analysis enabled us to locate significant and high lineal correlations of the variable measuring the birth of companies (*new firms*) with the following four variables: *Market share* ( $r = 0.993$ ), *Population* ( $r = 0.994$ ), *Industrial activity* ( $r = 0.979$ ) and *Industrial index* ( $r = 0.851$ ).

Figure 4. Number of new firms created in each municipality between 2000 and 2003



Source: drawn up by us using data published in the Business Register (BORME).

**Table 3. Matrix of lineal correlations**

		New firms	Industrial activities	Population	Population density	Size (Km <sup>2</sup> )	% Unemployment / population	Economic level	Industrial index	Foreign immigration	Registered unemployment rate (%)	University studies (%)	Home owners (%)	Market share	Industrial activity per km <sup>2</sup>
New firms	Pearson correlation	1	0.979 **	0.994 **	0.734 **	0.108	0.233 **	0.279 **	0.851 **	0.547 **	0.152 *	0.164 **	0.008	0.993 **	0.677 **
	Sig. (bilateral)	.	0.000	0.000	0.000	0.075	0.000	0.000	0.000	0.000	0.012	0.007	0.890	0.000	0.000
Industrial activities	Pearson correlation	0.979 **	1	0.984	0.740 **	0.138 *	0.247 **	0.306 **	0.867 **	0.506 **	0.154 *	0.176 **	0.004	0.987 **	0.703 **
	Sig. (bilateral)	0.000	.	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.011	0.003	0.947	0.000	0.000
Population	Pearson correlation	0.994 **	0.984 **	1	0.749 **	0.114	0.234 **	0.262 **	0.867 **	0.547 **	0.154 *	0.155 *	0.009	0.999 **	0.683 **
	Sig. (bilateral)	0.000	0.000	.	0.000	0.059	0.000	0.000	0.000	0.000	0.010	0.010	0.880	0.000	0.000
Population density	Pearson correlation	0.734 **	0.740 **	0.749 **	1	-0.102	0.258 **	0.205 **	0.548 **	0.181 **	0.163 **	0.063	0.002	0.759 **	0.954 **
	Sig. (bilateral)	0.000	0.000	0.000	.	0.092	0.000	0.001	0.000	0.003	0.007	0.299	0.974	0.000	0.000
Size (Km <sup>2</sup> )	Pearson correlation	0.108	0.138 *	0.114	-0.102	1	-0.235 **	0.176 **	0.096	0.102	-0.148 *	-0.005	0.015	0.119 *	-0.198 **
	Sig. (bilateral)	0.075	0.022	0.059	0.092	.	0.000	0.003	0.110	0.091	0.014	0.937	0.804	0.048	0.001
% Unemployment / population	Pearson correlation	0.233 **	0.247 **	0.234 **	0.258	-0.235 **	1	-0.181 **	0.156 **	0.084	0.552 **	0.013	-0.083	0.233 **	0.293 **
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	.	0.003	0.010	0.163	0.000	0.835	0.172	0.000	0.000
Economic level	Pearson correlation	0.279 **	0.306 **	0.262 **	0.205 **	0.176 **	-0.181 **	1	0.185 **	0.129 *	-0.170 **	0.285 **	0.020	0.267 **	0.261 **
	Sig. (bilateral)	0.000	0.000	0.000	0.001	0.003	0.003	.	0.002	0.032	0.005	0.000	0.743	0.000	0.000
Industrial index	Pearson correlation	0.851 **	0.867 **	0.867 **	0.548 **	0.096	0.156 **	0.185 **	1	0.485 **	0.081	0.149 *	-0.001	0.864 **	0.513 **
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.110	0.010	0.002	.	0.000	0.179	0.013	0.992	0.000	0.000
Foreign immigration	Pearson correlation	0.547 **	0.506 **	0.547 **	0.181 **	0.102	0.084	0.129	0.485 **	1	0.123 *	0.227 **	-0.033	0.537 **	0.144 *
	Sig. (bilateral)	0.000	0.000	0.000	0.003	0.091	0.163	0.032	0.000	.	0.041	0.000	0.585	0.000	0.017
Registered unemployment rate (%)	Pearson correlation	0.152 *	0.154 *	0.154 *	0.163 **	-0.148 *	0.552 **	-0.170	0.081	0.123 *	1	0.241 **	-0.151 *	0.154 *	0.168 **
	Sig. (bilateral)	0.012	0.011	0.010	0.007	0.014	0.000	0.005	0.179	0.041	.	0.000	0.012	0.011	0.005
University studies (%)	Pearson correlation	0.164 **	0.176 **	0.155	0.063	-0.005	0.013	0.285	0.149 *	0.227 **	0.241 **	1	0.100	0.158 **	0.107
	Sig. (bilateral)	0.007	0.003	0.010	0.299	0.937	0.835	0.000	0.013	0.000	0.000	.	0.099	0.009	0.077
Home owners (%)	Pearson correlation	0.008	0.004	0.009	0.002	0.015	-0.083	0.020	-0.001	-0.033	-0.151 *	0.100	1	0.009	-0.004
	Sig. (bilateral)	0.890	0.947	0.880	0.974	0.804	0.172	0.743	0.992	0.585	0.012	0.099	.	0.886	0.948
Market share	Pearson correlation	0.993 **	0.987 **	0.999 **	0.759 **	0.119 *	0.233 **	0.267 **	0.864 **	0.537 **	0.154 *	0.158 **	0.009	1	0.694 **
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.048	0.000	0.000	0.000	0.000	0.011	0.009	0.886	.	0.000
Industrial activity per km <sup>2</sup>	Pearson correlation	0.677 **	0.703 **	0.683 **	0.954 **	-0.198 **	0.293 **	0.261	0.513 **	0.144 *	0.168 **	0.107	-0.004	0.694 **	1
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.017	0.005	0.077	0.948	0.000	.

(\*\*) Correlation is significant at level 0.01 (bilateral). (\*) Correlation is significant at level 0.05 (bilateral).

Together with those previously mentioned, significant correlations were also observed between several of the variables considered. For instance: between industrial activities and population ( $r = 0.984$ ); between industrial activities and industrial index ( $r = 0.867$ ); and between market share and most of the variables considered. This led us to think that a certain amount of caution needs to be exercised when introducing variables into the model to avoid problems arising from multicollinearity. Moreover, it should be highlighted that the strong correlations shown by the lineal coefficients, between certain of the explanatory variables and the dependent variable, may be due to the possible influence of third variables<sup>14</sup>.

After analysing the relationship existing between the variables, and with the aim of detailing and estimating a lineal regression model for the variable *new firms*, various regression models have been tried. After considerations of both a statistical as well as economic nature, the one-equational model finally chosen, estimated by ordinary minimum squares, to explain the dependent variable, *new firms*, is the following:

$$FIRM = -15.501 + 2.795 ECOLEVEL + 0.308 INDINDEX + 70.326 AREA + 0.048 DENSITY + e_i$$

In other words the municipal economic level (*ECOLEVEL*), the municipal industrial activity index (*INDIND*), position as main commercial town (*AREA*) and municipal population density (*DENSITY*) are relevant factors to explain company birth. From the economic viewpoint, the model offers a reasonable interpretation since the four explanatory variables appear with a positive sign:

- The creation of firms is linked positively to the *economic level* of the municipalities analysed, in such a way that a favourable economic climate will prove an incentive to the emergence of new entrepreneurial initiatives.

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<sup>14</sup> This claim may be contrasted when obtaining partial correlation coefficients among the variables mentioned, namely the existing lineal relation adjusted to the effects of the remaining variables considered. For instance, the partial correlation coefficient between *new partnership firms* and *market share* is 0.13. This effect has also been noted with, among others, the variable *industrial activities*.



- Its position as *main town in the commercial area* has a positive influence, due to the existence of a potentially important market, both in terms of the demand within the municipality itself as well as in the surrounding towns.
- *Population density*, linked to the existence of a concentration of producers and above all, consumers proves a favourable element towards the creation of firms. This variable is linked to urbanisation economies. Moreover, it causes fewer problems as regards tolerance linked to the other possible variable to be used, *population*.
- Finally, *industrial activity index*<sup>15</sup> shows a positive relation with new firms, which might highlight the importance of inter-industrial relations as a conditioning factor in the creation of new firms. These results should be approached with a certain amount of caution due to the limitations inherent to this statistical indicator<sup>16</sup>.

From the analysis performed it might be concluded that in Castilla y León urbanisation economies and the existence of both a nearby market as well as quite a reasonable level of industrial activity on the part of companies have a significant impact on the creation of new firms.

When formulating the model, a higher number of variables were initially considered a priori, as it was felt they would have a higher explanatory potential although, finally, these expectations were not met, as a result of which they were rejected:

- In an effort to distinguish between urbanisation and agglomeration economies, the variable *industrial activities per km<sup>2</sup>*, was included, which might be used to account for the existence of agglomeration, yet it showed extremely strong correlation with both *population density* (0.954) and *industrial index* (0.513).

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<sup>15</sup> The model finally chosen includes the variable *industrial index*, as opposed to *industrial activities*, since the latter caused problems of multicollineality with the remaining variables. The second might be more closely linked to the theoretical concept of the existence of agglomeration economies as a conditioning factor in the creation of new firms, as it reflects the number of establishments in each municipality, whereas the first reflects this aspect collaterally.

<sup>16</sup> The index was drawn up using a local tax linked with the business activities (*impuesto de actividades económicas. IAE*). However, firms are exempt of paying in their first two years of business or if their net turnover of less than one million Euros per year.

- The variable *unemployment*, which is usually included in models proposed by other authors, has not appeared as relevant in the various models analysed, perhaps due to the possible influence of unemployment subsidy policy which may curb any entrepreneurial spirit arising from “need”.
- The variable *percentage of university studies* does not appear in the model, breaking with the idea that a high level of qualifications fosters the entrepreneurial spirit by providing technical and/or management skills for potential entrepreneurs, although this might prove relevant in the case of more technologically oriented firms. In any case, economic literature offers no conclusive evidence in this respect.
- *Immigration* has not proved to be significant, indicating that there is no adverse economic climate leading to any particular difficulty in finding paid work for this group, which might otherwise lead to considering the possibility of self-employment as an alternative.
- The variable *provincial capital* is not significant, although this is the result of the presence of the variable *main town in the commercial area*, which is, moreover, completed by population density to account for urbanisation economies.

As regards the joint as well as individual significance of the variables, the results are satisfactory, as can be seen from values of the statistical tests performed on the explanatory variables: individual Student t tests (Table 4) show values below 0.03 in all cases. For their part, values of the Schnedecor f test (Table 5), allow us to reject the null hypothesis that would discard the model. Standardised coefficients (beta), measuring the relative importance of the explanatory variables (Table 4), show that the variable which contributes most to the explanation is *industrial index* followed, in order, by *population density*, *main town in area* and *economic level*.

**Table 4. Estimation of coefficients**

Explanatory variables	Non-standardised coefficients		Standardised coefficients Beta	t Student statistic	Significance	Correlations			Colineality statistic	
	B	Typical error				Zero order	Partial	Semi-partial	Tolerance	FIV
(Constant)	-15.501	6.502		-2.384	0.018					
Economic level	2.795	1.282	0.049	2.179	0.030	0.279	0.131	0.047	0.920	1.087
Industrial index	0.308	0.017	0.514	17.790	0.000	0.851	0.734	0.385	0.559	1.788
Main town	70.326	7.574	0.252	9.286	0.000	0.700	0.491	0.201	0.635	1.574
Population density	0.048	0.004	0.335	12.746	0.000	0.734	0.612	0.276	0.675	1.481

Source: own using data published in the BORME.

**Table 5. Analysis of variance**

	<b>Sum of squares</b>	<b>Degree of freedom</b>	<b>Quadratic mean</b>	<b>Schnedecor F statistic</b>	<b>Significance</b>
Regression	656 753.248	4	164 188.312	467 342	0.000
Residual	95 208.738	271	351.324		
Total	751 961.986	275			

Source: own using data published in the BORME.

The explanatory capacity of these regressors is extremely high, explaining over 87% of variability of the endogenous variable, as shown by the corrected  $R^2$  coefficient (Table 6).

**Table 6. Summary of the model**

<b>R</b>	<b>R square</b>	<b>Corrected R square</b>	<b>Typical estimation error</b>
0.935a	0.873	0.872	18.744

Source: own using data published in the BORME.

#### 4. Conclusions

The analysis carried out thus far enables us to draw the following conclusions:

- The entrepreneurial fabric in Spain and in particular in Castilla y León is characterised by an orientation towards services with a prevalence of extremely small enterprises in the form of legal partnerships.
- Castilla y León, which is an Objective 1 Region in Community Regional Policy, shows lower entrepreneurial dynamics with a net variation in firms over the period 1996-2004 that is significantly below the national average, 11.9% and 23.4%, respectively.
- The creation of companies in municipalities in Castilla y León is directly linked to the economic level of the municipalities, the relative weight of industry in the municipality, whether it is the main town in the commercial area and population density. Nevertheless, the variable which explains company creation to the greatest extent is the relative weight of the industrial sector in the municipal economy.

From the analysis performed in this research, certain general guidelines for the implementation of regional development policy may be inferred:

- It is important to focus potential action aimed at fighting depopulation in those rural areas which possess a certain level of economic drive, given the influence that population and the level of industrial activity exert on the process of the creation of new companies.
- In agreement with the guidelines laid down in the “Green Paper on Entrepreneurship”, (European Commission, 2003), it is essential to foster, on the part of the public sector, a more favourable attitude towards the entrepreneur; with education playing a key role in this issue. A review of the economic literature performed has shown that the most dynamic regions in world economy (Canada and Australia) have been implementing strategies of this kind since the early nineties.

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### Annex: Variables used to explain the birth of firms

Name of the variables in the statistical tables and explanation		Source	1997	1998	1999	2000	2001	2002	2003
<i>New partnership companies, FIRM</i>	New partnership companies	BORME				X	X	X	X
<i>Population, POP</i>	Population, is the population corresponding to the census on 1 January each year	Economic Yearbook		X	X	X	X	X	X
<i>% unemployed over population UNEMPOP</i>	The number of unemployed registered at the unemployment office for each municipality on 1 July divided by the population of the same municipality with reference to the census on 1 January. It is calculated as the quotient of unemployed officially registered between the population and multiplied by 100.	Economic Yearbook	X	X	X	X	X	X	X
<i>Economic level ECOLEVEL</i>	Economic level is an ordinal variable measured at an interval that records disposable family income per inhabitant calculated in geographical areas. For 2003 the intervals considered were: 1-up to 7 000€; 2-from 7 000€ to 8 100€; 3-from 8 100€ to 9 000€; 4-from 9 000€ to 9 700€; 5-from 9 700€ to 10 800€; from 10 800€ to 11 500€; 6-from 11 500€ to 12 300€; 7-from 12 300€ to 13 000€; 8-from 13 000€ to 13 700€; 9-over 13 700€. Personal disposable income can be defined as the level of income available in households to spend and save, or the sum of all income perceived by households over a given period. This might be considered the total income from work, plus income from capital invested, social benefits and transfers, less direct taxes paid by the families and social security contributions. Sometimes the differences between disposable family income per inhabitant and calculations made of GDP per inhabitant.	Economic Yearbook		X	X	X	X	X	
<i>Industrial, index INDIND</i>	Industrial index is a comparative index of the importance of industry (including construction). This index is drawn up based on business tax paid corresponding to industrial activities. The value of the index reflects the relative weight (as so much per hundred thousand) of the industry of a municipality compared to the total in Spain, taking the total amount in Euros collected through taxation in Spain as the base	Economic Yearbook		X	X	X	X	X	
<i>Industrial activities INDACT</i>	Industrial activities is the number of industrial activities, subject to business tax as of 1 January each year. The number of industrial activities is practically equivalent to the number industrial establishment sin each municipality. Industrial activities are broken down into industrial activities in the strict sense of the term and construction. It comprises the following sectors: 1) energy and water; 2) mining and transformation of energy minerals and derived product, chemical industry; 3) metal manufacturing industries, precision mechanics; 4) manufacturing industries; 5) construction.	Economic Yearbook			X	X	X	X	X
<i>Immigration, IMMIGR</i>	Foreign immigration is the number of people registered in the census in each town hall as a result of the arrival of new residents from abroad.	Social Yearbook				X	X		
<i>% house owners, HOUSING</i>	Percentage of home owners.	Social Yearbook					X		
<i>University studies STUDIES</i>	Number of people who have graduated from university in relation to the population of 16 or over.	Social Yearbook					X		
<i>Market share, MARKSH</i>	This numerical index expresses in comparative terms the purchasing power or consumption of the municipalities. It indicates the share corresponding to each municipality over a national base of 100 000 units. The value of the indicator is obtained in terms of 6 variables: population, telephones (land lines), cars, lorries (lorries and vans), bank branches and retail trading.	Economic Yearbook					X	X	X
<i>Registered unemployment REGUNEM</i>	Number of registered unemployed in each municipality, 30 June each year, divided by the population of 15 or over in the same municipality, with reference to the census on 1 January that year.	Social Yearbook						X	X

Name of the variables in the statistical tables and explanation		Source	1997	1998	1999	2000	2001	2002	2003
<i>Provincial capital,</i> <i>CAPITAL</i>	Provincial capital (yes, no)		-	-	-	-	-	-	-
<i>Bordering capital,</i> <i>BORDCAP</i>	Bordering provincial capital (yes, no)		-	-	-	-	-	-	-
<i>Bordering Madrid</i> <i>BORDMADR</i>	Bordering Madrid (yes, no)		-	-	-	-	-	-	-
<i>Population density</i> <i>DENSITY</i>	Quotient between <i>POP</i> and <i>SIZE</i>		X	X	X	X	X	X	X
<i>Size</i> <i>SIZE</i>	Surface are of a municipality in square kilometres	Economic Yearbook							X
<i>Main town in area</i> <i>ÁREA</i>	Main town in area (yes, no). Municipality towards which the population of the other municipalities making up the same commercial area is drawn or towards which it is attracted in commercial terms.	Economic Yearbook							X
<i>Main town in sub-area</i> <i>SUBAREA</i>	Main town in subarea (yes, no). Municipality towards which the population of the remaining municipalities making up the commercial subarea is drawn in commercial terms.	Economic Yearbook							X
<i>Agglomeration economy</i> <i>AGGLOM</i>	Industrial activities per km <sup>2</sup> . Quotient between <i>INDACT</i> and <i>SIZE</i>				X	X	X	X	X