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# A regional analysis of Tourism Specialization in Spain

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## Abstract

Tourism sector is playing an important role in the development of a region, contributing to the economy growth and job creation. Despite of the actual crisis, Tourism activities continues to growth in the last year (UNWTO 2011). Also, Spain maintains in the better positions of the world ranking. Furthermore, Tourism activities generate around 10% of GPD and represents 11.5% of total workers of the Spanish Economy. Nevertheless, this is not true for all the Spanish Regions. There are regional differences in the number of tourist arrivals, level and quality of employment, number of open Hotels, amenities, etc. Consequently, it is necessary to concentrate on tourism phenomenon and its economic measurement. The main purpose of this paper is to analyses the tourism specialization in the Spanish Provinces. In general previous literature supports the idea that tourism enhances economic growth (Neves & Maças 2008). Tourism specialization has a positive and significant effect in different areas of our economies, for example, GPD, labour conditions, educational level...For that

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reason, it is essential to review the previous literature and clarify which indicators are the best ones to measure tourism specialization. Could tourism specialization make a difference in the regional economy? In order to study the tourism specialization, we focus on demand and supply side variables for tourism sector. Such factors may concern the quality and the capability of a destination to attract visitors. Moreover, we have included amenities variables referred to natural places, recreational sites and climate. We developed a cluster analysis to try do differentiate the tourism specialization. It is essential to understand the relationship between tourism characteristics, amenities and its economic impacts for public policies and tourism managing.

**Keywords:** Tourism, tourism specialization, regional development, spatial distribution.

**JEL:** L83, R58, R12

## 1. Introduction

Tourism plays an important role in economy growth and job creation, becoming a relevant target in public policies. Despite of the actual crisis, Spain maintains its position as the second biggest tourism earner worldwide and the first in Europe, and ranks fourth in international arrivals (UNWTO 2011). Moreover tourism has been less affected by the global crisis, and it has grown slightly in 2011 (3.4%). The impact of tourism depends on the level of tourism specialization, which varies between de Spanish regions. There are high regional differences in the number of tourist arrival, which cause different degrees of regional specialization in tourism. Could tourism specialization make a difference in the regional economy? Consequently, it is worth to contribute to the previous literature on the tourism industry as key factor of economy growth at regional level.

Analysing the tourism specialization should be a key objective when evaluating tourism activities. Researchers have been interested in studying the relationship between tourism specialization and the economic growth for specific countries (Balaguer & Cantavella-Jordá 2002), Eugenio-Martin et. al 2004). In fact, empirically previous studies reinforced the idea that there is a direct effect from the tourism to the economic growth. Neves and Maças (2008) affirm tourism specialized countries grow more than others on average. Their results also support the idea that poor countries benefit always form tourism specialization. Besides, Yang (2012) has found that tourism density affects the degree of tourism development, and the tourism specialization at a provincial level has a positive effect on the development of the tourism industry.

Tourism specialization has a positive effects on tourism employment and workers' labour conditions For instance, Fernandez et al. (2009) show the incidence of low-wages is lower in those regions which are more specialized in tourism. In this line, other study (IET 2011) found that regions more specialized in tourism, Balearic and Canary Islands, presented a strong association between the tourist flows of non-residents and the employment. Furthermore, previous research found that high levels of tourism specialization had positive effects on income per capita and the quality of

available health facilities (Perdue et al 1991), and on education expenditures (Urtasun & Gutierrez 2006).

The aim of this paper is to identifying the level of tourism specialization. It should be necessary to examine the literature about this topic, and find the correct measures to approach to the concept. Also, we want to classify Spanish Regions depending on the degree of Tourism Specialization. These purposes become a fundamental aim for the formulation of tourism policies.

The paper is organized as follows: Section 2 provides a review of the concept of Tourism from an economic point of view, the main studies about tourism influence on economic growth and the definition of the indicators that measure tourism specialization by region. Later on, in section 3 we present the database used, we describe variables included from demand and supply side of tourism, and we present the results. The final section sums up the main conclusions of the analysis

## **2. Background: Tourism and its specialization**

Tourism is a heterogeneous industry which represents a wide variety of business types and sizes, so it is not a sector in the traditional sense of the word and it does not fit the standard criteria for national accounts. Tourism is defined as the activities of travellers, taking trips outside their usual environment for less than a year for a main purpose not related to the exercise of an activity remunerated from within the place visited (OECD 2008). Tourism is a demand side phenomenon based in the viewpoint of consumption: it provides goods and services that are consumed by visitors. In that sense, tourism could have effects not just on the Tourism Characteristic activities,<sup>3</sup> but on all kind of economic activities (although in a different intensity). For this reason, it is

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<sup>3</sup> Tourism characteristic industries are those establishments dedicated to the production of tourism characteristic products: “products which in the absence of visitors, in most countries would probably cease to exist”. It has been proposed a list of Tourism Characteristic Industries: “Productive activities that produce a principal output which has been identified as characteristic of tourism”. Nevertheless, tourism industries are able to do secondary activities together with main activities, generating different products from tourism products, selling their products not only to tourist and excursionists, but also to other types of agents (residents on the local area).The Spanish Statistic Institute (IET) defined a list of characteristic tourism activities according the recommended methodological framework approved by International Organizations (WTO, OECD...)

important to analyse its effect on the overall economy, even if, we pay specially attention to the Hotel and Restaurant industry as the main tourism sector.<sup>4</sup>

Tourism is by definition a demand-side phenomenon but we are able to measure it also from the supply-side, and both approaches are complementary. We argue that we need to account for both approaches in order to capture properly the tourism effects, attending to the reliable data. Obviously, tourism facilities as the number of hotel establishments, bedplaces... are essential to understand the tourism specialization, but the visitors need more motivation in the destination area.

Understanding the relationship between tourism specialization and amenities has relevance in economic, social and environmental dimension. From this point of view, tourism planning should bear in mind that tourism specialization in any region is a complex combination of amenities, tourism firm characteristics (Marcouiller et al. 2004). In fact, the tourism specialization and its growth has become a central objective of a large number of authorities, at a national and a local level.

Thus, amenities are part of decision making because visitors generate expectations and have diverse motivations. (Leiper 1990). Besides, tourism activities use these amenities as part of its production. In fact, Marcouiller and Prey (2005) measures the dependence of regional tourism on natural amenities and recreational sites. They suggest that amenities are a key factor to the competitiveness and profits of tourism firms.

Consequently, business in each region is part of the attraction system of the destination place. As Gunn (1994) points out attractions get a magnetic pulling power, and without attractions, tourism does not exist. Many authors concluded tourism attractions could classified in different types as for example: natural, social, historical, recreation and shopping, infrastructure and food (Gearing, C.E. et al. (1974):); Activity places as cultural facilities, sport facilities and amusement facilities (Jasen-Verbeke 1986); Natural amenities and recreational sites (Marcouiller & Prey 2005).

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<sup>4</sup> Note that this sector concentrates the 50% of the tourism employment and provide 94% of its output to tourism.

Looking at Rosentraub and Joo results (2009), they obtained different effects of each type of industry. Investments in amusements and sports attractions were associated with higher levels of tourism employment and higher household incomes. They find public policies are most efficient if they are focused on sports and amusements. However, cultural activities do not have statistically significant impact on the level of tourism employment. Previous literature has found that cultural and art facilities had no positive impact on employment levels in the tourism industry and for economic development<sup>5</sup>. Therefore, it would be this distinction in the analysis if possible.

Natural amenities include multiplicity of definitions referred to climate, coast line or natural areas (Marcouiller et al 2004). Amenities are considered specific characteristics linked to regions. Climate variables as annual average temperature or precipitation could explain tourism behavior well, especially if we are interested in annual tourism flows, not only in seasonal arrivals. Lise and Tol (2002) combine both variables to examine their combined effects. Climate has effects on tourism demand and satisfaction. Climate should be incorporated to tourism planning in order to offer recreational activities accurate for weather conditions.

### **Un pouco máis de parques y sitios naturais.**

As Deller et.al (2008) suggested there are some limitations for studying the relationship between amenities and development. They addressed the hard measuring of those diverse amenities, and the spatial unit of analysis occasioned problems because some are site specific in one region, while other cover larger geographic regions. In fact, in the literature on tourism specialization or degree of tourism development, many measures have been defined but there is no consensus about the more suitable; in fact each index could account for different particularities.

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<sup>5</sup> This fact is related with the higher percentage of voluntary labour that works at museums (Law (1993)). Also, the intangible impact of the arts is extremely valuable but unquantifiable, thus the tangible effects are small (Whitt 1988).

## **.Concept and measures:**

### **2.1. How to measure tourism specialization?**

Most studies are constrained by data availability at a regional-local disaggregation and use single variables as a proxy. Attending to the data for Spanish province level, we can define the following amenities variables:

#### **- Demand-side**

Studying tourism flows could be valuable to identify different degree of specialization in tourism. Besides it is essential to study tourist flows at a regional level given that the current competition in the tourism market between regions and regional product-market, even between local areas (Jansen-Verbeke 1995). In fact, In Spain tourism marketing policies depending on the regions, and its importance is even greater than the former national promotion. Thus, an accordingly with the available data for the Spanish regions,<sup>6</sup> we have included different proxies to measure its specialization and its dependence on tourism.

Certainly, the obvious indicator is the number of **Tourist arrivals**, i.e. the absolute value of the number of tourist for each region and period. This is an important variable to account for since the quantity of tourists is the main aim of the most tourism policies. It is true that magnitude and the type of expending of these visitors could be different depending on their nationality and consequently, they could have different effects. Cortés-Jiménez (2008) found that only domestic tourism has a positive influence on the economic growth of internal regions. However, the findings reveal economic growth of coastal regions is due to both types of tourists (domestic and foreign).

Authors indicate that the most important difference in the expending is between domestic and foreign tourism.<sup>7</sup> The importance of domestic tourism is strongly biased by the simple fact that the size of a country (and the diversity of tourist destinations in

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<sup>6</sup> Given the data available, we use data for regions. Spain is composed of 52 regions “provinces”.

<sup>7</sup> In Spain, the inter-regional flows have increased its weight in last years, and consequently, it is important to analyse the effects on labour market.



that country) plays an important role in these statistics (Jansen- Verbeke, 1995)<sup>8</sup>. For this reason, it could be interesting to distinguish between these two types of tourist. Spanish Tourism has a large domestic component (55.6%) being higher than the international tourism (IET 2011), although both types of tourism are significant in terms of economic contribution, its effects are different. For example, Foreign Tourist has a higher average daily expenditure than the national tourist (101.90 euros versus 33.80 euros), and bigger average stay (9.2 days versus 4.4 days). It is relevant to differentiate both types of tourism.

Nevertheless, differences in scale between the regions could make difficult sensible comparisons. For this reason, we define the **Tourist Intensity Ratio (TIR)** as the percentage of tourists to the resident population. This ratio has advantages in balancing the number of incoming tourists against the number of inhabitants. It is accurate to define the real capacity of the main regional market. World Bank calculated this proportion for each country as a ratio to total population (2004) but it would make sense consider it for each region. McElroy (2003) indicated that TIR is the most common measure of tourism's sociocultural impact.

Other possibility is the **Tourist Density Ratio (TDR)**: Percentage of tourists to land area (Tourist arrivals/ Km<sup>2</sup>). The interest of this ratio is in line with the anterior index, given that the specialization of each region is different according with the size of the region. In addition this measure should be better to approximate environment impacts, not only social effects (McElroy 1998).

A further step it will be the **Tourism Intensity Rate (TIR 2)**, which is a mix of previous indicators: It is calculated as quotient between tourists arrivals and both, population and land area.

#### - **Supply side**

Even if Tourism is a demand-side phenomenon, we should take into account its effects on the supply side to account and have a better understanding of the general effects on the economy. From this point of view, one also needs to consider the supply

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<sup>8</sup> The fact of crossing a national frontier counts as international tourism, irrespective of the actual travel distance.

of accommodation (and thus potential traditional tourism demand). From this point of view we look at the **Tourist Function Index**, which is based on the accommodation capacity of an area in relation to the number of inhabitants, i. e. the number of available beds divided by the permanent resident population

It is important to look at the employment that tourism generates. To identify a region as specialized in tourism we compare its employment distribution in the region with the national distribution in the following way.

$$\frac{\frac{E_{ij}}{\sum_i E_{ij}}}{\frac{\sum_j E_{ij}}{\sum_j \sum_i E_{ij}}} * 100,$$

being  $E_{ij}$  the employment of sector  $i$  in province  $j$ . If the index is higher than 100 it means that the region  $j$  has a higher percentage of sector  $i$  compared with this proportion of total employment relative to other regions. In other words, it means that province  $j$  will be specialized in sector  $i$ . We could name this index as the **Employment Location quotient**. This is a clearer index of the employment specialization of each province in the tourism characteristic activities. It takes into account the distribution of the tourism employment in a region, relative to the employment in the rest of the economy

#### - Amenities

By defining amenities in a broad manner, we try to catch most if not all of the general dimensions of them. We have included the **length of the coast** by provinces, because it captures the potential of attractive beach holidays (Deller et.al 2008). Coastline turns into a significant variable for a Mediterranean country, where tourism demand is characterized by the model of sun and beach. Given that most of tourism activities take place outdoors, they depend on the climate variations as for instance sun and beach destinations (Frechtling 2001). Then, we look at the **Annual Average Temperature**. It is expected pleasant weather permit to capture all recreational opportunities for outdoor activities, and the tourism satisfaction. In this line, it is included the Annual Average Precipitation because would have effects on the climatic comfort of tourists, and in sightseeing developing.

Referring to Natural Amenities exist many alternatives. We have chosen the number of National Parks, and the World Heritage Sites. **National Parks** are natural areas with a high natural and cultural value, and little altered by human activity. Accordingly with a Spanish law, these areas deserve priority attention parks due to their representative character, the uniqueness of its flora, fauna or its geomorphological formations. Thus, it is declared general interest of the nation because it is representative of the Spanish natural heritage<sup>9</sup>. The Spanish National Parks have international recognition. They involve the objective of enjoyment by the citizens and constitute a tourist attraction.

We also have used the number **World Heritage Sites** placed in each province. The World Heritage places are selected following mixed criteria with natural and cultural points, as for example: representing a masterpiece of human creative genius, being an exceptional testimony to cultural tradition or to a civilization, containing superlative natural phenomena with natural beauty, significant natural ecosystems with a biological diversity and threatened species.

### 3. Methodology

#### 3.1. Data

The data is provided by the Institute of Tourism Studies<sup>10</sup>. We use the Hotel Occupancy Survey (HOS), which is a monthly database elaborated by the National Statistical Institute. The information is provided by the hotel establishments, which constitute the analysis unit. The hotels considered are included in the corresponding register of the Tourism Department in each region (CCAA), and are those who offer

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<sup>9</sup> An area should be declared a National Park being representative of the natural system, have a large surface in order to permit the natural and ecological processes, presenting a little intervention on its natural territory, being inhabited inside, and being surrounded by an area that could be declared as peripheral protection area.

<sup>10</sup> A visitor is a traveler taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited. These trips taken by visitors qualify as tourism trips. Tourism refers to the activity of visitors. A visitor is classified as a tourist (or overnight visitor) if his/her trip includes an overnight stay.

services of collective accommodation with or without collective information. The data refers to demand side and supply side. So on the one hand, it provides information about travellers, overnights stays and average stay, disaggregated by country of residence of the traveller, category of the establishment and region. On the other hand, supply side variables are the estimated number of establishments open for the season, estimated number of bed places, occupancy rate and labour information, also disaggregated by category of establishment and region.

We use the following variables in our study:

❖ **Demand side**

- Travellers are “all persons who stay one or more consecutive nights in the same accommodation”. We also use the number of travellers classified by their country of residence, so we distinguish between Spanish residents and Residents abroad.
- Overnight stays refers to each night that a traveller stays in an establishment. And subsequently, the average stay is the number of days that each traveller stays on average in the hotel establishment<sup>11</sup>.

❖ **Supply side**

- Open establishments which are understood to be that establishment in which the month of reference is included within its opening period.
- Bed places are the number of fixed beds estimated in the establishment during the open season<sup>12</sup>.
- Hotel personnel are defined “as the group of people, remunerated and not remunerated, who contribute with their work to the production of goods and services in the establishment during the reference period of the survey, even when they work outside the premises”.

Additionally in order to complement the labour market data, we also have the statistics on Registered Unemployment and Registered Labour Movements which come from the Employment and Social Security Statistics Yearbook, and from the Labour

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<sup>11</sup> So it is calculated as the quotient between the number of nights and the number of travelers.

<sup>12</sup> Extra beds therefore are not included and double beds are equal two vacancies.

Statistics Bulletin (published by the Ministry of Employment and Social Security). This database proportionated data of Social Security Affiliated Workers classified as wage earner or as self-employment (supply side variables).

Finally, the data linked to amenities is provided by diverse public organism as for example the National Geographical Institute, Spanish State Meteorological Agency (AEMET), or the Ministry of Agriculture and Environment.

### **3.2. Tourism Specialization: Regional Differences**

We have elaborated different maps to can understand easily the regional differences in terms of tourism specialization (See Annex 1). In the case of foreign tourist, we can observe that only few coastal regions in the Mediterranean are specialized in this kind of arrivals. The number of foreign tourist arrivals is very high relative to the regions' area. The highest specialized regions are Archipelagos, Barcelona, Madrid and Málaga (the last 3 provinces have an urban city of tourism attraction). Regarding Spanish tourists, we also have to classify as tourism specialized regions: the one located in the North and Atlantic coast of Spain. These seaside regions receive a high number of national tourists, especially during the summer period. Thus, we could suggest a relationship between tourism specialization and seasonality in the case of national tourism.

Attending to the Tourism Intensity Ratio for foreign tourists, we continue obtaining few regions specialized in foreign tourism: only Mediterranean provinces, Archipelagos, and a few interior regions (those provinces with big cities). On the other hand, the bigger number of tourist arrivals relative to population, increases the number of tourism specialized provinces. This tourism specialization is clearer in the coastal regions. In the case of the central part of Spain the ratio could be higher given that the population is very few. So the results should be taking carefully. If we take into account that we are comparing tourism density index with residents density index, those regions with the low density index are the ones they appear to be touristic and they weren't before (centre of Spain).

Focusing in the characteristics of hotels, we obtain that coastal provinces shows a higher accommodation capacity relative to its area. Nevertheless, we observe the case

of internal regions (Zamora, Soria or Teruel) with a bigger number of beds relative to inhabitants. The explanation is not base in a relevant tourism industry, but the lower level of population (we should relativize this data). A similar spatial patter shows the Tourism Location Quotient. We can observe that again the coastal regions have tourism employment specialization. Also, there are few regions in the interior of the country, which have also a higher index.

### 3.3. Cluster Analysis

As we have shown and explained previously the regional differences in tourism specialization, but now the question is to see if we can group these different regions according to their characteristics

We use the cluster analysis technique (Everitt *et al.*, 2001), which allows us to group regions by level of tourism development. Hierarchical clustering creates hierarchically related sets of clusters. Hierarchical clustering methods are generally of two types: agglomerative or divisive. We implement single-linkage hierarchical agglomerative clustering. Single-linkage clustering suffers (or benefits, depending on your point of view) from what is called chaining. Because the closest points between two groups determine the next merger, long, thin clusters can result. In our case, this type of clustering works better for doing a better definition of tourism region and to identify problems with some variables.

Besides, the data has been standardized in order to avoid bias due to the magnitude of the variables. We standardized data as following:

$$E_{ij} = \frac{S_{ij} - \min_i}{\max_i - \min_i}$$

being  $E_{ij}$  the standardized value which corresponds to the variable  $i$  for the region  $j$ ,  $S_{ij}$  the correspondent value not standardized, and  $\min_i$  and  $\max_i$  correspond to the minimum and maximum.

In order to identify the characteristics of a Tourism developed region we show a dendrogram after implementing the cluster analysis and the means of the indicators for the 10 main groups.

**Table 1: Demand-side variables for Spanish tourism: TIR2, TIR, TDR.**

| Group | TIR2<br>Spanish tourism<br>(mean) | TIR<br>Spanish tourism<br>(mean) | TDR<br>Spanish tourism<br>(mean) |
|-------|-----------------------------------|----------------------------------|----------------------------------|
| 1     | 0.20                              | 0.15                             | 1.00                             |
| 2     | 0.39                              | 1.00                             | 0.04                             |
| 3     | 0.09                              | 0.00                             | 0.54                             |
| 4     | 0.59                              | 0.12                             | 0.10                             |
| 5     | 1.00                              | 0.13                             | 0.44                             |
| 6     | 0.78                              | 0.50                             | 0.51                             |
| 7     | 0.92                              | 0.34                             | 0.57                             |
| 8     | 0.76                              | 0.59                             | 0.32                             |
| 9     | 0.58                              | 0.02                             | 0.44                             |
| 10    | 0.26                              | 0.31                             | 0.11                             |

In this case, we should emphasize than the indicators do not agree in the classification of tourism regions. For example in group 1, the TDR will define these regions as very touristic region (maximum value 1), while the other two indicators define them as a low tourism region (average indicator close to 0). In these sense, we should be cautious with these indicator and see with particularities are creating these divergences.

**Demand-side variables for Foreign tourism: TIR2, TIR, TDR.**

| Group | TIR2<br>foreign tourism<br>(mean) | TIR<br>foreign tourism<br>(mean) | TDR<br>Foreign tourism<br>(mean) |
|-------|-----------------------------------|----------------------------------|----------------------------------|
| 1     | 1                                 | 1                                | 1                                |
| 2     | 0.46                              | 0.37                             | 0.48                             |
| 3     | 0.43                              | 0.28                             | 0.41                             |

|           |      |      |      |
|-----------|------|------|------|
| <b>4</b>  | 0.32 | 0.38 | 0.22 |
| <b>5</b>  | 0.09 | 0.13 | 0.48 |
| <b>6</b>  | 0.05 | 0.08 | 0.32 |
| <b>7</b>  | 0.16 | 0.23 | 0.24 |
| <b>8</b>  | 0.17 | 0.21 | 0.13 |
| <b>9</b>  | 0.10 | 0.11 | 0.19 |
| <b>10</b> | 0.02 | 0.03 | 0.02 |

Using the same indicator for foreign tourism as we have used before, Spanish tourism the disagreement is much lower. Just for some groups as 5 or 6 the TDR keep given a different picture than the TIR.

### **Supply-side variables: Location quotient, FI**

| <b>Groups</b> | <b>Location quotient<br/>(mean)</b> | <b>Function Index<br/>(mean)</b> |
|---------------|-------------------------------------|----------------------------------|
| <b>1</b>      | 1.00                                | 1.00                             |
| <b>2</b>      | 0.88                                | 0.52                             |
| <b>3</b>      | 0.73                                | 0.46                             |
| <b>4</b>      | 0.49                                | 0.41                             |
| <b>5</b>      | 0.48                                | 0.27                             |
| <b>6</b>      | 0.32                                | 0.27                             |
| <b>7</b>      | 0.27                                | 0.31                             |
| <b>8</b>      | 0.32                                | 0.14                             |
| <b>9</b>      | 0.12                                | 0.19                             |
| <b>10</b>     | 0.14                                | 0.09                             |

From the demand side, the picture from the indicator selected is much clear and both indicators lead us to the some clustering. Also the classification is closer to what we expect being the island the most touristic regions.

### **Amenities: Temperature and Precipitation (and their squares) and Coastline**



| Groups | Temperature<br>(mean) | Temperature <sup>2</sup><br>(mean) | Precipitation<br>(mean) | Precipitation <sup>2</sup><br>(mean) | Coastline<br>(mean) |
|--------|-----------------------|------------------------------------|-------------------------|--------------------------------------|---------------------|
| 1      | 0.39                  | 0.30                               | 0.56                    | 0.35                                 | 1.00                |
| 2      | 0.96                  | 0.95                               | 0.00                    | 0.00                                 | 0.47                |
| 3      | 0.27                  | 0.20                               | 0.92                    | 0.85                                 | 0.00                |
| 4      | 0.42                  | 0.33                               | 1.00                    | 1.00                                 | 0.28                |
| 5      | 0.68                  | 0.60                               | 0.26                    | 0.09                                 | 1.00                |
| 6      | 0.41                  | 0.33                               | 0.17                    | 0.05                                 | 1.00                |
| 7      | 0.16                  | 0.11                               | 0.21                    | 0.07                                 | 0.79                |
| 8      | 1.00                  | 1.00                               | 0.05                    | 0.01                                 | 0.00                |
| 9      | 0.28                  | 0.22                               | 0.66                    | 0.47                                 | 0.08                |
| 10     | 0.39                  | 0.32                               | 0.22                    | 0.08                                 | 0.13                |

### Amenities: UNESCO Heritage and National Park

| Groups | Unesco)<br>(mean) | Parks<br>(mean) |
|--------|-------------------|-----------------|
| 1      | 0.75              | 1               |
| 2      | 0.25              | 0.667           |
| 3      | 0.75              | 0.334           |
| 4      | 0                 | 0.334           |
| 5      | 0.5               | 0.334           |
| 6      | 0.25              | 0.334           |
| 7      | 1                 | 0               |
| 8      | 0.25              | 0               |
| 9      | 0.75              | 0               |
| 10     | 0                 | 0               |
| 11     | 0.5               | 0               |

### Tourism Variables: Demand side, Supply Side and Amenities

| g_tur3 | Tir2<br>Foreign<br>mean | Tir2<br>Spanish<br>mean | Location<br>quotien<br>mean | Function<br>Index<br>mean | Coast<br>mean | Temperature<br>mean | Precipitation<br>mean | Unesco<br>mean | National<br>Parks<br>mean |
|--------|-------------------------|-------------------------|-----------------------------|---------------------------|---------------|---------------------|-----------------------|----------------|---------------------------|
| 1      | 0.43                    | 0.92                    | 0.73                        | 0.46                      | 0.00          | 1.00                | 0.05                  | 0.75           | 1.00                      |
| 2      | 1.00                    | 0.78                    | 1.00                        | 1.00                      | 0.33          | 0.53                | 0.18                  | 0.50           | 0.33                      |
| 3      | 0.46                    | 0.57                    | 0.88                        | 0.52                      | 0.47          | 0.96                | 0.00                  | 0.00           | 0.33                      |
| 4      | 0.03                    | 0.27                    | 0.19                        | 0.10                      | 1.00          | 0.39                | 0.56                  | 0.75           | 0.00                      |

|           |      |      |      |      |      |      |      |      |      |
|-----------|------|------|------|------|------|------|------|------|------|
| <b>5</b>  | 0.02 | 0.08 | 0.00 | 0.05 | 1.00 | 0.68 | 0.26 | 0.25 | 0.00 |
| <b>6</b>  | 0.00 | 0.02 | 0.07 | 0.05 | 1.00 | 0.41 | 0.17 | 0.25 | 0.67 |
| <b>7</b>  | 0.32 | 0.81 | 0.49 | 0.41 | 0.00 | 0.37 | 0.38 | 0.25 | 0.00 |
| <b>8</b>  | 0.17 | 0.70 | 0.32 | 0.27 | 0.58 | 0.51 | 0.25 | 0.75 | 0.00 |
| <b>9</b>  | 0.15 | 1.00 | 0.14 | 0.05 | 0.00 | 0.27 | 0.92 | 0.25 | 0.00 |
| <b>10</b> | 0.03 | 0.29 | 0.19 | 0.12 | 0.13 | 0.37 | 0.28 | 0.38 | 0.09 |

In this last step, we remove the variables that create problems in the clustering such as squared temperature and squared precipitation. Also, we drop TIR and TDR for both, Spanish and foreign tourism. Final results show a quite sensible clustering. Nevertheless, in a next step we need use other cluster techniques to do bigger groups.

## 4. Conclusions

*“Work in progress”*

Tourism has become a key sector in our economy, especially during the crisis.

The greater presence of Foreign tourist in Archipelagos and a clearer dependency on national tourism in the case of the Northern Spanish Regions. So, the results shows big different model for Spanish tourism: North VS South.

Finally, it is important to highlight the different effects that the resident and non-resident tourist shows, so, we need to analyse this point deeply.

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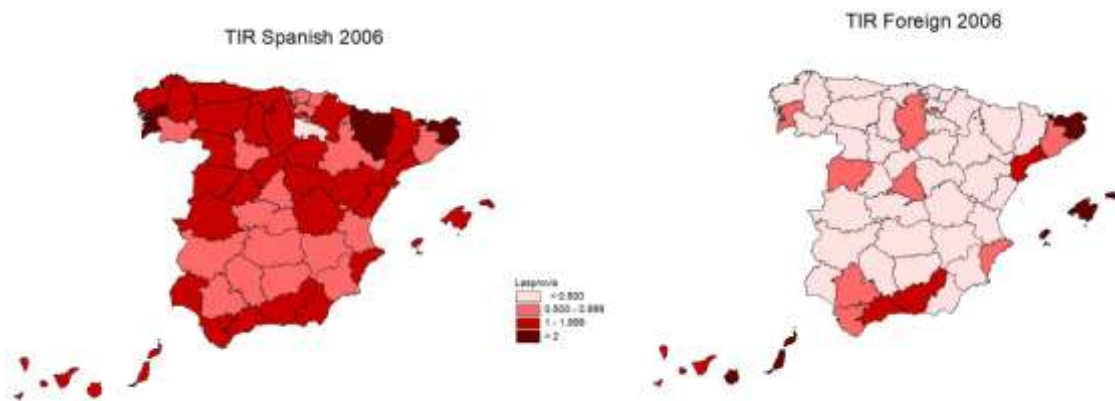
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# Annex 1

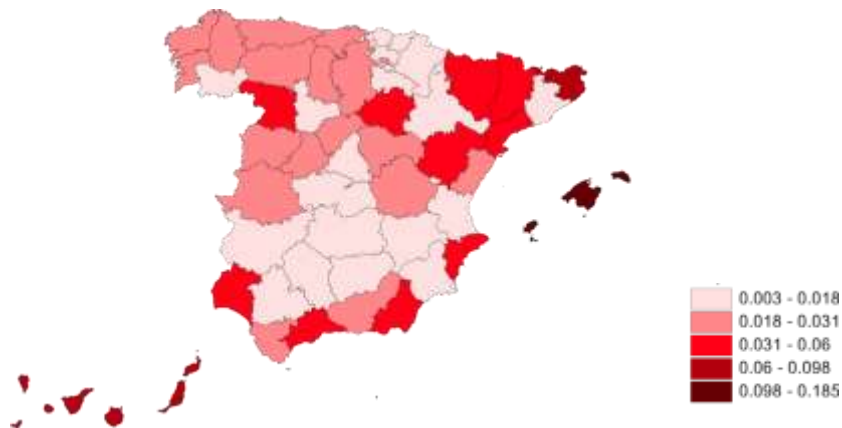
Graphic 1: Tourism Density Ratio (2006)



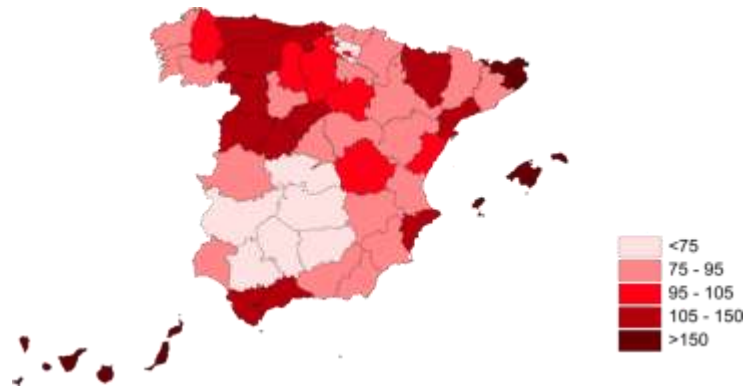
Graphic 2: Tourism Intensity Ratio (2006)



Graphic 3: Tourism Function Index (2006)



**Graphic 4: Location quotient (2006)**



**Graphic 5: Unesco Heritage (2006)**



**Graphic 6: Natural Parks (2006)**



**Graphic 7: Annual average temperature (2006)**



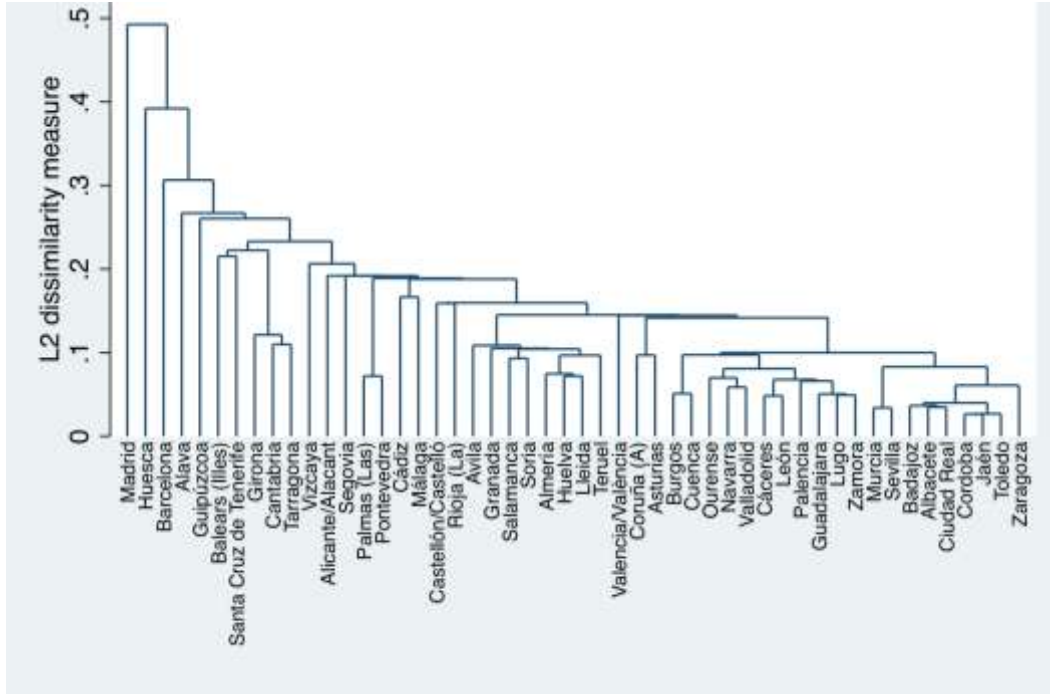
**Graphic 8: Annual average precipitation (2006)**



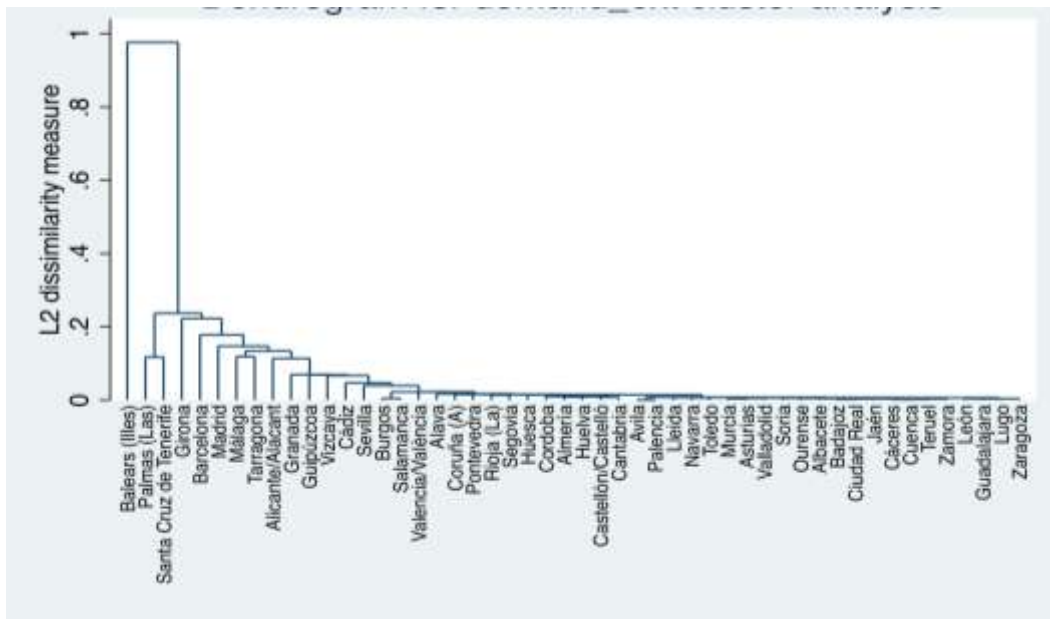


## Annex 2

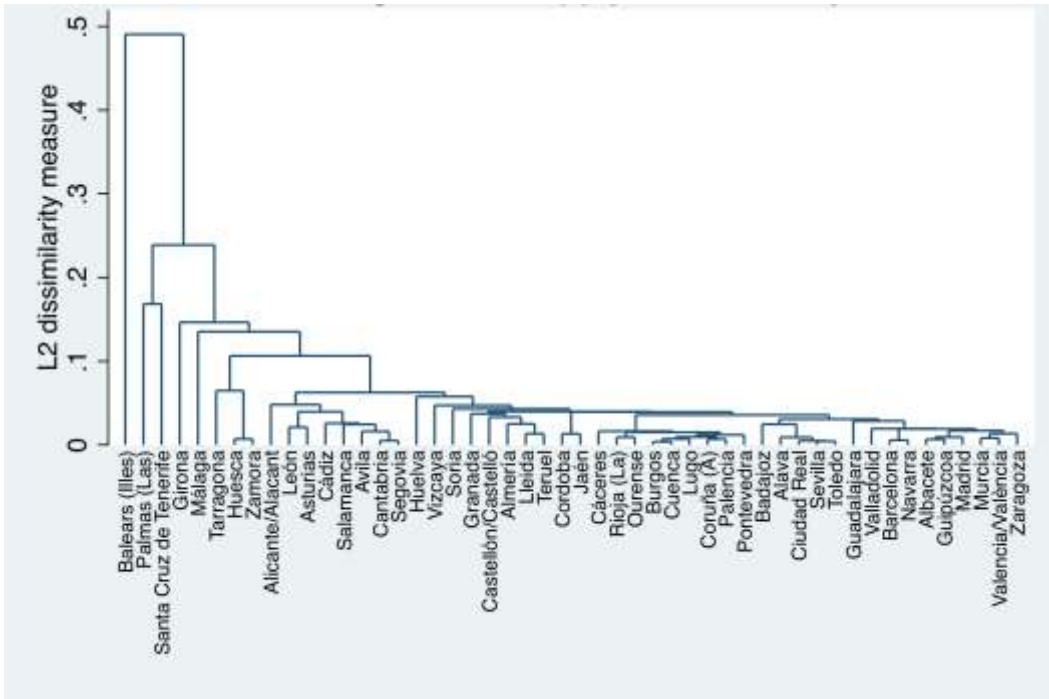
Graphic 1: Dendrogram for Demand-side. Variables included for Spanish tourism: TIR2, TIR, TDR



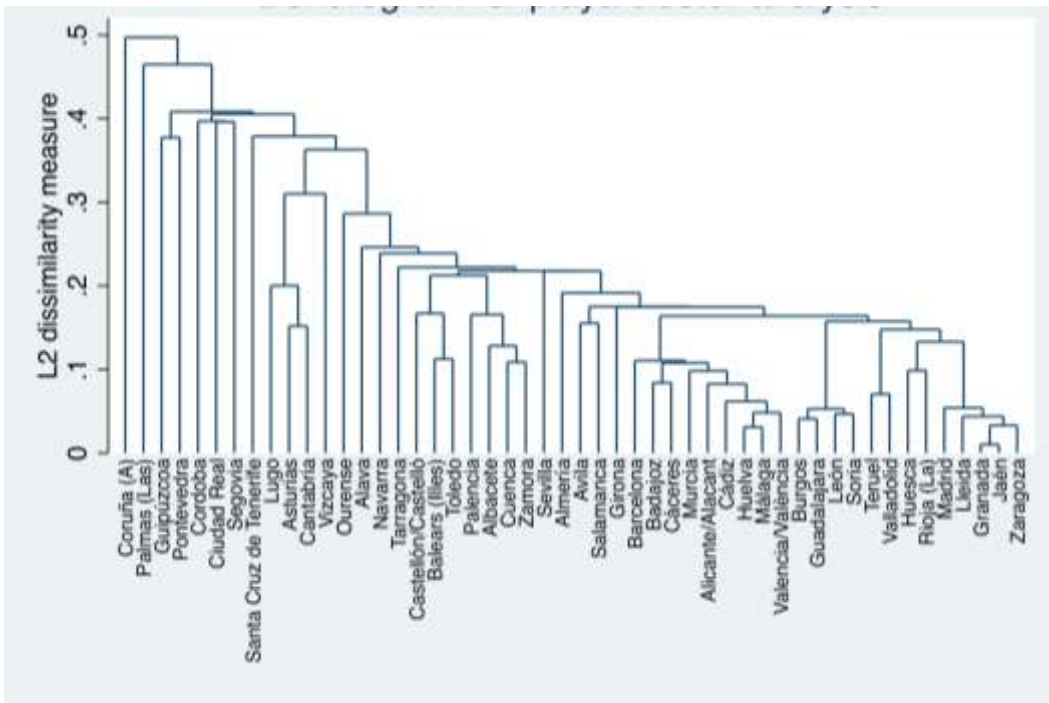
Graphic 2: Dendrogram for Demand-side. Variables included for Foreign tourism: TIR2, TIR, TDR



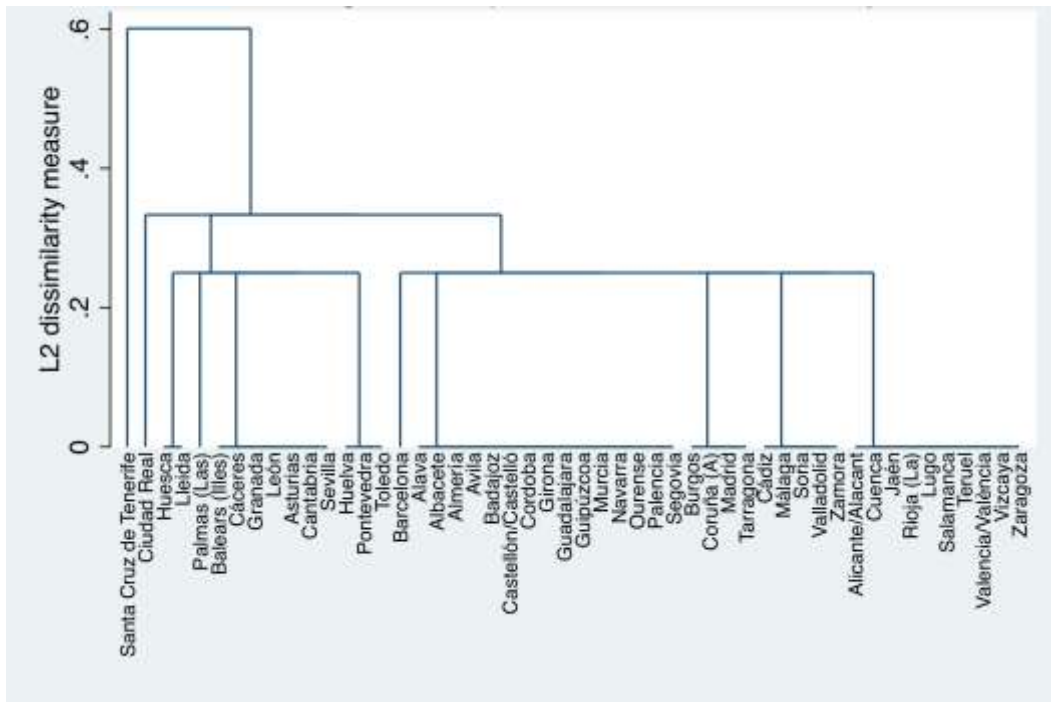
**Graphic 3: Dendrogram for Supply-side. Variables included: Location quotient, fi**



**Graphic 4: Dendrogram for Amenities: Variables included: Temperature and Precipitation (and their squares) and Coastline**



Graphic 5: Dendrogram for UNESCO Heritage and National Park



Graphic 6: Dendrogram for Tourism with all variables

