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A Measuring Tourism Specialization:
a Composite Indicator for the Spanish Regions

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ABSTRACT

Tourism sector is playing a key role in the development of a region, therefore tourism activities continue to growth in the last year despite the actual crisis (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 in 2011. Nevertheless, this is not true for all the Spanish Regions. The main purpose of this paper is to analyze the tourism specialization in the Spanish Provinces. In general previous literature supports the idea that tourism enhances economic growth (Neves & Maças 2008). Given that we are able to define Tourism specialization from very different perspectives, it is essential to review the previous literature and clarify which indicators are the best ones to measure tourism specialization. In order to measure tourism specialization from a wide point of view, we account for both demand and supply side variables for tourism sector, and amenities. We developed principal component analysis (PCA) in order to summarize the information provided by the different measures. It is essential to understand the relationship between tourism characteristics, amenities and its economic impacts for public policies and tourism managing.

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Keywords: Tourism, Labour Market, Tourism Specialization, Temporary Jobs, Regional Development.

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Introduction

Tourism currently plays an important role in the economy, contributing to job creation and the growth of the economy, as well as having a significant impact on the local economy, environment, and population. In accordance with its increasing relevance, recently researchers have started studying this phenomenon and its economic impact. At the same time, tourism has become an important focus for public policies. Central and regional governments have been concentrated on attracting tourists and developing the supply side. However, as Spanish provinces have not achieved the same level of success, they undoubtedly present huge differences in terms of international tourist arrivals, domestic tourists, number of hotels, etc.

Furthermore, the maintenance and improvement of competitiveness in the tourism activities could considerably contribute to promoting intelligent, sustainable and integrated growth. This smart specialization is vital to the European Strategy 2020. The European Commission suggests that smart specialization means identifying the unique characteristics and assets of each region, and highlighting their competitive advantages (European Commission, 2012). Consequently, it is necessary to identify the characteristics of Spanish tourism specializations at regional level in order to analyze current and potential effects on the economy.

Researchers have become increasingly more interested in studying the relationship between tourism specialization and economic growth (Neves and Maças, 2008). Previous literature shows that tourism specialization has a positive and significant effect in many different areas of our economies, for example in regards to GDP, labor conditions, and education levels… (Yang, 2012; Fernández et al., 2009; Urtasun & Gutiérrez, 2006).

Thus, the main aim of this chapter is to define the concept of tourism specialization to look for the best measure to approach this concept. As a result, the first step is to identify the precise variables for defining tourism specialization, such as tourist arrivals, employment levels, number of open tourism establishments, etc. and we analyze different indicators for specialization as proposed by the literature. Secondly, we apply the specialization indices to the data available at a regional level (provinces) in order to find the regional disparities in the Spanish territory. And thirdly, a synthetic indicator is built in order to summarize all the information and to establish a destination ranking in terms of tourism specialization.

1. Tourism specialization measures

As we mentioned before, the tourism sector plays an important role in regional development, contributing to the growth of the economy and job creation. Despite the current crisis, tourism activities have continued to grow in the last year (UNWTO, 2011). Moreover, Spain maintains one of the highest positions in the world rankings. Furthermore, tourism activities generate around 10% of GPD and represent 11.5% of the total workers in the Spanish economy (IET, 2011). Nevertheless, these facts are not accurate for all Spanish regions. There are remarkable regional differences in the

number of tourist arrivals, the level and quality of employment, characteristics of supply-side tourism, amenities, etc.

Researchers have been interested in studying the relationship between tourism specialization and economic growth for specific countries (Balaguer & Cantavella-Jordá, 2002; Eugenio-Martin et al., 2004). In fact, previous empirical studies reinforced the idea that there is a direct effect of tourism on economic growth. Neves and Maças (2008) affirm that touristically specialized countries grow more than others on average. They have measured tourism specialization according to data from the World Development Indicators (tourist arrivals as a population proportion, tourism receipts as a percentage of exports, and as a percentage of gross domestic product). Their results also support the idea that poor countries always benefit from tourism specialization. Besides, Yang (2012) has found that tourism density affects the degree of tourism development and that tourism specialization at a provincial level has a positive effect on the development of the tourism industry. In this case, tourism specialization is approached with a location quotient of tourism revenues, i.e. measurement of provincial tourism specialization relative to the whole country.

In addition to economic growth, tourism specialization could have a positive effect on tourism employment and workers' labor conditions. For instance, Fernandez et al. (2009) show the incidence of low-wages is lower in those regions that are more specialized in tourism. Along this same line, another study (IET, 2011) found that regions that are more specialized in tourism, like the Balearic and Canary Islands, presented a strong association between the tourist flow of non-residents and employment levels. Furthermore, previous research found that high levels of tourism specialization had positive effects on income per capita, the quality of available health facilities (Perdue et al., 1991), and on education expenditures (Urtasun & Gutierrez, 2006).

Nevertheless, there is no consensus on the definition of Tourism specialization. Which variable should we use to determine if a region is specialized or not? Actually, even if tourism is, by definition, a demand-side phenomenon, it affects the supply-side and we are able to measure it from this point of view as well. We argue that we need to account for both approaches in order to account for by tourism specialization properly, attending to the reliable data (both approaches are complementary). Obviously, tourism facilities such as the number of hotel establishments and bed places are essential to understanding tourism specialization, but visitors base their decision on more than just these things when they are choosing a destination area. For this reason, understanding the relationship between tourism specialization and amenities has relevance in economic, social and environmental dimensions. From this point of view, tourism planners should bear in mind that tourism specialization in any region is a complex combination of amenities in addition to firm characteristics of tourism (Marcouiller et al., 2004). Indeed, 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 their production. Marcouiller and Prey (2005) measure 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, businesses in each region are an integral part of the attraction system of the destination. As Gunn (1994) points out, attractions have a magnetic pulling power, and without attractions, tourism would not exist.

As a result, we argue that tourism is a multidimensional phenomenon and in order to achieve a complete definition of tourism development we must account for the demand side (visitors determine tourism), supply-side characteristics and amenities (both natural and cultural).

1.1. Demand side

Studying tourism flows could be valuable in order to identify different degrees of specialization in tourism. Besides, it is essential to study tourist flows at a regional level given the current competition in the tourism market between regions and the regional product-market, and even between local areas (Jansen-Verbeke, 1995). In fact, in Spain, tourism marketing policies vary depending on the region, and their importance is even greater than the former national promotion.

Certainly, the obvious indicator is the number of **tourist arrivals, i.e.** the absolute value of the number of tourists for each region and period. But it also is true that the magnitude and the type of expenditures of these visitors could be different depending on their place of residence and consequently, they could have different effects on the economy. In fact, Cortés-Jiménez (2008) found that only domestic tourism has a positive influence on the economic growth of internal regions. However, findings reveal the economic growth in coastal regions is due to both types of tourists (domestic and international). For this reason, it could be interesting to distinguish between these two types of tourists.

Nevertheless, we should take into account that the importance of domestic tourism is strongly biased by the simple fact of country size and the diversity of tourist destinations in that country (Jansen- Verbeke, 1995). Moreover, differences in scale between the regions could make sensible comparisons among them difficult. For this reason, we define the **Tourist Density Ratio (TDR)** as the percentage of tourists to land area (Tourist arrivals/ Km^2). In addition, this measure would be a good proxy of both environmental impact and social effects (McElroy & De Alburqueque, 1998).

TDR has no upper bound, so it could be useful, not only for comparisons among regions but also with the population density of each region. By doing so, we are able to define the **Tourist Intensity Ratio (TIR)** as the percentage of tourists to the resident population. This ratio has the advantage of balancing the number of incoming tourists against the number of inhabitants. In fact, this index is accurate enough to define the real capacity of the main regional market and, as McElroy (2003) indicated, is the most common measure of tourism's socio-cultural impact. World Bank calculated this proportion for each country as a ratio to total population (2004) but it did not account for regional differences inside each country, assuming a homogenous distribution of the tourism within the whole country.

As we said before, domestic tourism shows significant differences in the average length of the stay with respect to international tourists, so we should incorporate it to our indicators. As a result, these basic measures can be improved by more vigorous indicators like **Tourism Penetration Ratio (TPR) or Augmented Tourism Density Ratio (ATDR)** (De Alburqueque & Mc.Elroy, 1992):

$$TPR = \frac{Tourist * Average\ length\ stay}{Population * 365}$$

$$ATDR = \frac{Tourist * Average\ length\ \ stay}{Area * 365}$$

Along this line, we also have included the **Tourism Concentration Index** (TCI**)** as the total number of tourist nights (N) in the region j relative to the total number of nights spent in the whole country divided by the total number of the population (P) in the region j relative the total population in whole country. The TCI can be considered as a measure of the contribution of tourists' nights (Jasen-Berveke, 1995).

1.2. Supply side

Even if Tourism is a demand-side phenomenon, we should take into account its effects on the supply side in order to have a better understanding of the general effects on the economy. From this point of view, one also needs to consider accommodations (and thus potential traditional tourism demand). Thus, we look at the **Tourist Function Index (FI)**, 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.
We could also include a **Room Index (RI)**, which is the number of beds per square kilometer. This would be a measure of tourism specialization, and a proxy of environmental penetration (Mc.Elroy & De Alburqueque, 1998). Finally, we consider that the quotient between the number of **beds per establishments (BE)** is a measure of the size of the Accommodation Industry. To have a more precise idea of the regional accommodation capacity we define the **Relative Beds per Establishment** as the number of tourist beds (RBE) in the region j relative to the total number of beds in the whole country divided by the total number of establishments (E) in the region j relative to the total number of establishments in whole country.

$$RBE = \frac{N_j \Big/ \sum_i N_j}{P_j \Big/ \sum_i P_j}$$

If the RBE is higher than 100 it means that region *j* has a higher accommodation capacity compared to the country average.
From the supply-side point of view, it is also 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:

$$ELQ = \frac{E_{ij} \Big/ \sum_i E_{ij}}{\sum_j E_{ij} \Big/ \sum_j \sum_i E_{ij}} * 100$$

Eij being the employment of sector *i* in province *j*. If the index is higher than 100 it means that region *j* has a higher percentage of sector *i* compared with the proportion of total employment relative to other regions. In other words, it means that province *j* will be specialized in sector *i*. We name this index the **Employment Location quotient (ELQ)**. This index takes into account the distribution of the tourism employment in a region, relative to the employment in the national economy. Thus, we measure if a region is specialized in tourism (from the perspective of employment) more than the national average.

Finally, it is beneficial to include other indices related to the rest of Characteristic Tourism Industries, such as cultural, sporting or recreational services. Besides, this variable could measure attraction facilities (Jasen – Berbeke, 1986). Following these criteria, we have also calculated a **Location Quotient** for *Amusement, Cultural, Sports activities* in addition to the *Hotel and Restaurants* industry using the number of establishments.

1.3. Amenities

As Deller et al. (2008) suggest, there are some limitations to studying the relationship between amenities and development. They address the hard measuring of those diverse amenities, and the spatial unit of analysis occasioned problems because some are site specific to one region, while others 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 most suitable; actually, each index could account for different particularities. Most studies are constrained by data availability at a regional-local disaggregation and use single variables as a proxy.

Based on the previous literature, we have included different amenities according to the available data.[1] By defining amenities broadly, we try to cover most, if not all, of their general dimensions. We focus on those amenities that have the potential to attract visitors, international tourists and residents.

So, what are people´s motivations of travel in our country? According to the IET sources, 54.2 % of domestic travels in 2011 are made with the purpose of leisure, recreation or holidays (IET c, 2011). If we look deeper into the analysis, we can disaggregate leisure motivation by main incentive: relaxing on a campsite or beach (70.7%), cultural activities (10.7%), other recreational activities (16.2) and sports activities (2.4%). Additionally, Familitur data provides the main activities done by tourists during their holidays in 2011. The most relevant are cultural activities like visiting museums, monuments, and cities (50.2%) or shopping (67.8%), relaxing on the beach (44.3%), visiting and enjoying the countryside (41%), nightlife (28.6%) and cultural performances (16.9%).

For international tourist arrivals, travel for leisure, recreation and holidays accounted for 84% of total arrivals. Within this group, 5 out of 10 international tourists visit cultural facilities or are involved in cultural performances. Also, Amusement Activities attracted 21 % of tourists. Finally, it is remarkable to notice that 25.2% of international tourists who decide to visit Spain are motivated by the climate (IET Habitur 2010). They find the good possibility of sunny and warm holidays of high importance. This

percentage increases for international tourists that visit Spain in the off-peak season (35.4% motivated by the climate). Besides, 12.6% of international tourists care about the presence of the beach.

Based on the literature (Gearing et al.,1974; Jasen-Verbeke, 1986; Marcouiller & Prey, 2005) and tourism motivations in Spain, we could classify tourism amenities as: 1) Natural amenities , 2) Social and historical amenities, 3)Recreation (sports, amusement and cultural activities) and shopping amenities.

(1) Natural amenities include multiple definitions referring to climate, coastline or natural areas (Marcouiller et al., 2004). Climate variables could explain tourism behavior, especially if we are interested in annual tourism flows, not only in seasonal arrivals. In fact, climate has an effect on tourism demand and satisfaction. Pleasant weather affords the possibility of taking advantage of all recreational opportunities in terms of outdoor activities, and tourism satisfaction, for this reason we should account for **Annual Average Temperature.** Along this same line, **Annual Average Precipitation** would then have an effect on the climatic comfort of tourists, and in sightseeing development. Lise and Tol (2002) combine both variables to examine their combined effects. Moreover, Mata & Llano (2010) also use temperature for explaining the domestic tourism form inner to coastal regions. Thus, climate should be incorporated into tourism planning in order to offer recreational activities appropriate to weather conditions.

Including the **length of the coast** captures the potential of attractive beach holidays (Deller et al., 2008). Coastline turns into a significant variable for Mediterranean countries, where the model of sun and beach characterizes tourism demand. Also, coasts contain areas of special landscapes with exceptional scenery, which are part of the motivation of relaxation in the countryside. Given that most tourism activities take place outdoors, they depend on the climate variations, such as in sun and beach destinations (Frechtling, 2001). Concerning the Spanish case, Mata & Llano (2010) include a relevant variable the coastline, as a attractor factor for domestic tourism.

In the case of natural areas, there are variables concerning wildlife refuges or national parks, and others related to water and forest resources: lakes, rivers, fishing areas, hunting preserves, hiking paths, etc (Deller et al., 2005). These natural areas are considered to generate benefits derived from recreational and tourism activities (Green, 2001). **National Parks** are natural areas with high natural and cultural value, and have little interferences caused by human activity. According to Spanish law, these areas deserve priority attention due to their representative character, the uniqueness of their flora, fauna and geomorphologic formations. Thus, it is declared of general interest to the nation because it is representative of the Spanish natural heritage[2]. Spanish National Parks have international recognition. They involve the objective of enjoyment by the citizens and constitute a tourist attraction.

(2) Referring to *Social and Historical amenities,* we could use the World Heritage Sites classification from Unesco. **World Heritage Sites** are selected using mixed criteria with natural and cultural points, such as, for example: representing a masterpiece of human creative genius, being an exceptional testimony to cultural tradition or to a civilization, containing superb natural phenomena with natural beauty, significant natural ecosystems with biological diversity and/or threatened species. The Unesco World Heritage classification would be a perfect proxy of cultural destinations, which constitute the main motivations of tourism in our country. Moreover, Patuali et al.

(2010) explains that culture is a force for attracting domestic and international tourism. They find a positive relationship between cultural heritage and tourism inflows for Italian regions.

(3) Each type of *attraction industry* (sports, amusement and cultural activities) could cause a different effect on the tourism employment creation and on regional economic growth (Rosentraub & Joo, 2009). 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 when they are focused on sports and amusements. However, neither cultural activities nor art activities result in having a statistically significant impact on the level of tourism employment. Previous literature has found that cultural and art activities had no positive impact on employment levels in the tourism industry nor economic development. To measure the attraction facilities, it is beneficial to include the **number of shops per person**. One of the most common activities done by tourists is going shopping, so it is necessary to include a variable to measure this factor of attraction in destination areas.

2. An empirical approximation: Tourism specialization for Spanish provinces

As we have seen in the previous section, the literature has defined multiple indicators accounting for tourism specialization and seasonality. Nevertheless, on one hand, there is no agreement on the best indicator. On the other hand, each of them measures one particularity of tourism. As a result, in this section we develop a synthetic indicator for tourism specialization and another for tourism seasonality that summarizes all information without losing the multidimensionality.

We will focus on the analyses of 2001 (year at the beginning of the last decade and before the inmigration boom in Spain),[3] 2006 (year not affected by economic crises) and 2011 (year before the economic economic crises) in order capture the evolution but we will report additional data in the annex referring to the other years in this period (2001-2011)[4]. Thus, this is the largest temporal and homogeneous sample that we can obtain for international and domestic tourists that stayed in the Tourism Accommodation Sector in the Spanish provinces.[5] In addition, in this period we are able to look at the evolution of tourism from before and after the global economic crisis.

2.1. Databases

In order to get data on tourists arrivals, employment, rooms etc., 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 (CC.AA.), and they are those who offer services of collective accommodation with or without collective information. The data refers to variables from the *demand side* and the *supply side*. So on one hand, it provides information about travelers, overnights stays and average stay, disaggregated by country of residence of the traveler, category of the establishment and region. On the other hand, supply-side variables are the estimated number of establishments

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open for the season, estimated number of bed places, occupancy rate and labor information, also disaggregated by category of establishment and region.
The definitions of the variables that we use in our analysis are the following:

- Tourists are "all persons who stay one or more consecutive nights in the same accommodation". We also use the number of travelers classified by their country of residence, so we distinguish between Spanish residents and residents from abroad.
- Overnight stays refer to each night that a traveler stays in an establishment. And subsequently, the average stay is the number of days that each traveler stays on average in the hotel establishment[6].
- Open establishments are understood to be the establishments in which the month of reference is included with the opening period.
- Bed places are the number of fixed beds estimated in the establishment during the open season[7].
- Hotel personnel are defined "as the group of people, remunerated and not remunerated, who contribute 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, the data linked to amenities is provided by diverse public organisms, for example, the National Geographical Institute, **Spanish State Meteorological Agency (AEMET)**, or the Ministry of Agriculture and Environment. In order to include the climate index, we obtained the data from the AEMET. It is necessary to clarify that we have used data from the period 1971-2000 in order to use the normal values (not affected by extreme circumstances). To measure the attraction facilities and number of establishments from the supply side, we have used data from the **Central Business Register**. The survey shows the number of local units by location and branch of activity (following the General Industrial Classification of Economic Activities (NACE) developed by the European Statistical Office). We have chosen as a proxy the number of establishments in Hotels and Restaurants (NACE 55), the number of shops (retail trade, NACE 52), and the number of Amusement, Cultural, and Sports establishments (NACE 92). In the second branch of activities, a wide range of activities are included, such as cinemas, theatres, performing art activities, amusement parks, fairs, festivals, discos, sports performances and events, libraries and museums, exhibitions, and gambling industries. Finally, the Spanish Heritage Sites are obtained directly from UNESCO's World Heritage Convention website, which provides a list of all World Heritage Sites by country, year of inclusion and nature of the site.

2.2. Tourism Specialization: A description

Before presenting the results of the synthetic indicator, we are going to analyze the regional differences in the indices that we have defined in the previous section and that we will use to construct the synthetic indicator.
We have elaborated different maps in order to be able easily understand the regional differences in terms of tourism specialization (See Annex Maps). The main fact that we are assuming is that Spain is specialized in tourism. Thus, we have divided the values

into three ranges: the central one shows that a region is specialized in tourism with averages similar to Spain on the whole. So, the inferior range stands for a region which is not specialized in tourism for this specific indicator. And, the superior range indicates that the region is specialized in tourism more than the Spanish average.

2.2.1. Demand side

In the case of TDR for Spanish tourists, we have found that specialized regions are almost all the coastal provinces, including the Atlantic, North and Mediterranean coasts and the archipelagos. These seaside regions receive a high amount of domestic tourism. Also, Madrid is specialized in domestic tourism given that it is a popular city destination. We can observe that there are fewer regions specialized the arrivals of international tourists. The most specialized regions are the archipelagos, Barcelona and Madrid (provinces that have an urban city tourism attraction), Mediterranean regions, such as Girona, Tarragona, Alicante and Valencia, and some Andalusian coastal provinces (Cadiz, Malaga, Granada and Seville). Besides, we found that Vizcaya and Guipúzcoa are the only specialized regions in the Northern part of the country..

Concentrating on the Tourism Intensity Ratio for international tourists, we have found that few regions are specialized in international tourism: only coastal regions (Girona, Barcelona, Tarragona, Granada and Malaga) and the arquipelagos. On the other hand, the larger amount of Spanish tourist arrivals relative to the population increases the number of tourism specialized provinces[8]. This tourism specialization is even more clear in the coastal regions. At the same time, the internal provinces of Castilla León and Castilla La Mancha are specialized in domestic tourism because Madrid is such a large source region. So, the results should be interpreted carefully. If we take into account that we are comparing the tourism density index with the resident density index, those regions with a low density index are the ones that appear to be touristic that previously were not (centre of Spain).

When we control the tourist arrivals by the average length of stay and population, the findings are similar. In the case of Tourism Penetration Ratio (TPR), coastal regions and internal provinces around Madrid are specialized in domestic tourism. However, in the case of international tourists, only Mediterranean regions in Catalonia and Alicante as well as Malaga and the archipelagos are specialized. The Augmented Tourism Density Ratio findings show that those regions specialized in domestic arrivals are: the Atlantic coast, the North coast (except Lugo) and all Mediterranean provinces (except Murcia). For international arrivals, ATDR confirms that only Madrid, Cadiz, Malaga, Valencia, Catalonia´s coast and the archipelagos are specialized. The daily visitors relative to the area is higher than the Spanish average. Along the same line with the previous demand-side indicator, Tourism Concentration confirms that coastal regions and internal regions around Madrid are specialized in domestic overnight visitors. Also, it is important to note that Huesca and Girona appeared as tourism specialized regions. The reason being that these provinces constitute relevant skiing tourism destinations.

2.2.2. Supply side

Focusing on the supply side, the Function Index shows that provinces, e.g., the archipelagos, Malaga, Almeria, Alicante, Tarragona and Girona, have a higher

accommodation capacity than the average Spanish Tourism levels. Other internal provinces and Cantabria present the same level as the Spanish average. The room index provided consistent results because low population levels do not influence it. According to the Room Index, specialized regions with bigger accommodation capacities relative to land area are: Pontevedra, A Coruña, Cantabria, Vizcaya, Guipuzcoa, the provinces of Catalonia and the Valencian Community, the Balearic and Canary Islands, and Cadiz, Malaga and Almeria in the south. Finally, in relation to the size of the establishments, the Relative Beds per Establishment shows that the hotels with the biggest accommodation capacity are located in Barcelona, Tarragona, the Balearic and Canary Islands, Huelva, Malaga, Almeria and Alicante. Again, Madrid and the rest of the Mediterranean coastal regions present the Spanish average of supply-side specialization.

Focusing on the labour market, the Employment Location Quotient shows that coastal regions in the South (Huelva, Cadiz, Malaga, Granada and Almeraa), Alicante, Tarragona, Girona and the archipelagos are specialized in tourism employment. Moreover, we observe that the some internal regions (Zamora, Soria, Teruel, Caceres) are also specialized. The explanation is not based on a relevant tourism industry, but rather the low levels of other economic activities. In order to evaluate the supply side, the location quotient calculated for the Hotels and Restaurants (Tourism Characteristic Activities) demonstrates that internal regions with low population density and a low level of economic activities are specialized. At the same time, the southern coast, Alicante and Archipelagos have Hotel and Restaurants Specialization. The economic specialization in Amusement, Cultural, and Sports establishments are close to Spanish levels in the majority of coastal regions and in provinces around Madrid. The most specialized in this industry are Madrid, the archipelagos and Caceres.

2.2.3. Amenities

Finally, the indicators constructed to describe amenities support the big differences between the North and South when referring to climate conditions. Although the number of National Parks is concentrated in just a few provinces, the number of Unesco World Heritage sites is similar in all of the Spanish provinces. The regions with the highest presence of Unesco World Heritage sites are: A Coruña, Burgos, Madrid, Huesca, Lleida, Barcelona and Girona.

3. Methodoloy: A Composite Indicator

Given that the wide range of indicators referring to the demand side, the supply side, and amenities, our objective is to construct a synthetic indicator able to summarize the information and to establish a ranking in terms of tourism specialization and seasonality. Composite indicators serve to measure multidimensional concepts. Ideally, they should be based on a theoretical framework, in which individual variables are selected, combined and weighted in a manner which reflects the dimensions or structure of the phenomenon being measured (Blancas et al., 2010). Variables are ordered hierarchically and organized into factors or pillars, which are dimensions that we want to synthesize into one single measure.

According to previous literature there is no perfect methodology for constructing a synthetic index. When analyzing tourism specialization, there is no consensus about the best index to measure tourism specialization nor an objective quantification of the relative importance of each one. Thus, we select the Principal Component Analysis (PCA) that is a multivariate statistical technique used to reduce the number of variables into a smaller number of dimensions (Pearson, 1901; Hotelling, 1933). It is widely used as a weight aggregation system when defining synthetic measures. In mathematical terms, from an initial group of n correlated variables, PCA creates uncorrelated indices or components, where each component is a linear weighted combination of the initial variables. For example, from a set of variables X_1 through to X_n:

$$PC_1 = a_{11} x_1 + a_{12} x_2 + \cdots + a_{1n} x_n$$
$$PC_m = a_{m1} x_1 + a_{m2} x_2 + \cdots + a_{mn} x_n$$

Where a_{mn} represents the weight for the m principal component and the n variable. A prior step to any data aggregation is the normalization of the data in order to make comparisons, since each variable has different units (OECD, 2008; Jacobs et al., 2004). So we used the min-max approach to rescale variables, so the worst value across all the regions receives a score of 0 and the best a 1:

$$X_{ij} = \frac{v_{ij} - Min}{Max - Min}$$

The technique of Principal Component Analysis has a lot of advantages. It enables the aggregation of a lot of information in order to represent a limited number of variables (which is a linear combination of the original variables). Also, using this method we avoid multicollinearity problems arising from the incorporation of interrelated variables (Mata & Llano, 2012). It allows us to make comparisons, rank countries or regions in various performance and policy areas due to the large amount of information integrated. Moreover, it is valuable as a communication and policy tool. In the area of tourism it is used to rank and benchmark destinations. It is also used to classify tourism destinations depending on the place of origin and destination characteristics (Cantalone et al., 1989; Gallarza et al., 2002).

It is necessary to compute the Kaiser-Meyer-Olkin (KMO) test, in order to verify the suitability of the data for PCA and to test the level of correlation between the indicators. The KMO measures the suitability of the sample and determines whether sufficient observations have been used for applying the PCA. The KMOs calculated for the different dimensions and for the aggregated level index exceed 0.5, which is a suitable level (Blancas et al., 2010; Chhetri et al., 2004). The significance of KMO value shows the adequacy of the PCA to be conducted.

Then, applying PCA to the pillars conceptual structure requires making some choices. The first one concerns the number of components that should be retained for each indicator. In this study, according to OECD (2008), we have extracted all the principal components which are associated to an eigenvalue higher than 1 and whose value has an incidence higher than 10% of the sum of all the eigenvalues. Furthermore, we have

also taken into consideration the rule of keeping enough factors to account for 60% of the variation. Once the number of components to extract is identified, a score for each province is calculated as an arithmetic mean of the component scores weighted by the share of variance explained by each component. The subsequent synthesis of pillars into a single value is then obtained through an arithmetic mean.

4. Results for Tourism Specialization

Based on the literature and on the descriptive analysis we have grouped the indicators into four pillars: Demand side for Domestic tourists, Demand side for International Tourists, Supply side, and Amenities. Using the KMO, we have selected the following indicator for each of the pillars:

Table 1: Pillars and indicators for conceptualizing Tourism Specialization

Pillars/Dimensions	Variables	Source
Demand-side Domestic Tourists	Tourism Penetration Ratio Augmented Tourism Density Ratio	HOS
Demand-side International Tourists	Tourist Density Ratio Tourist Intensity Ratio Tourism Penetration Ratio Tourism Density Ratio	HOS
Supply-side	Tourism Function Index Room Index Beds per Establishment Location Quotient Hotel & Restaurants Location Quotient Leisure establishments Location Quotient Employment Location Location Quotient	HOS HOS HOS Central Register Bureau Central Register Bureau HOS
Amenities	Length of the coast Annual average temperature Annual average precipitation National Parks World Heritage sites Shops per person	National Geographic Institute AEMET AEMET Ministry UNESCO Central Register Bureau

Note: Rural data is not included for homogeneous purposes

As we can see in Map 1 and Table 2, there are small changes in the top positions of the provinces with the highest degree of tourism specialization. The results confirm that the Canary and Balearic Islands are the most touristically specialized regions in Spain. The archipelagos present the best results in the aggregated index, and in the four pillars.[9] In fact, Baleares is in the first position during the whole period analyzed due to the highest degree of tourism specialization in tourism arrivals and supply side. However, Baleares does not hold the best position in the amenities pillar, which worsened in the last years relative to the rest of the provinces. We observe that Canary Islands provinces keep in the second and third position with the highest degree of tourism specialization in the four pillars.

Map 1: PCA ranking Tourism Specialization

2001

2006

2011

Legend

■	1 - 10
■	11 - 20
■	21 - 30
■	31 - 40
■	41 - 50
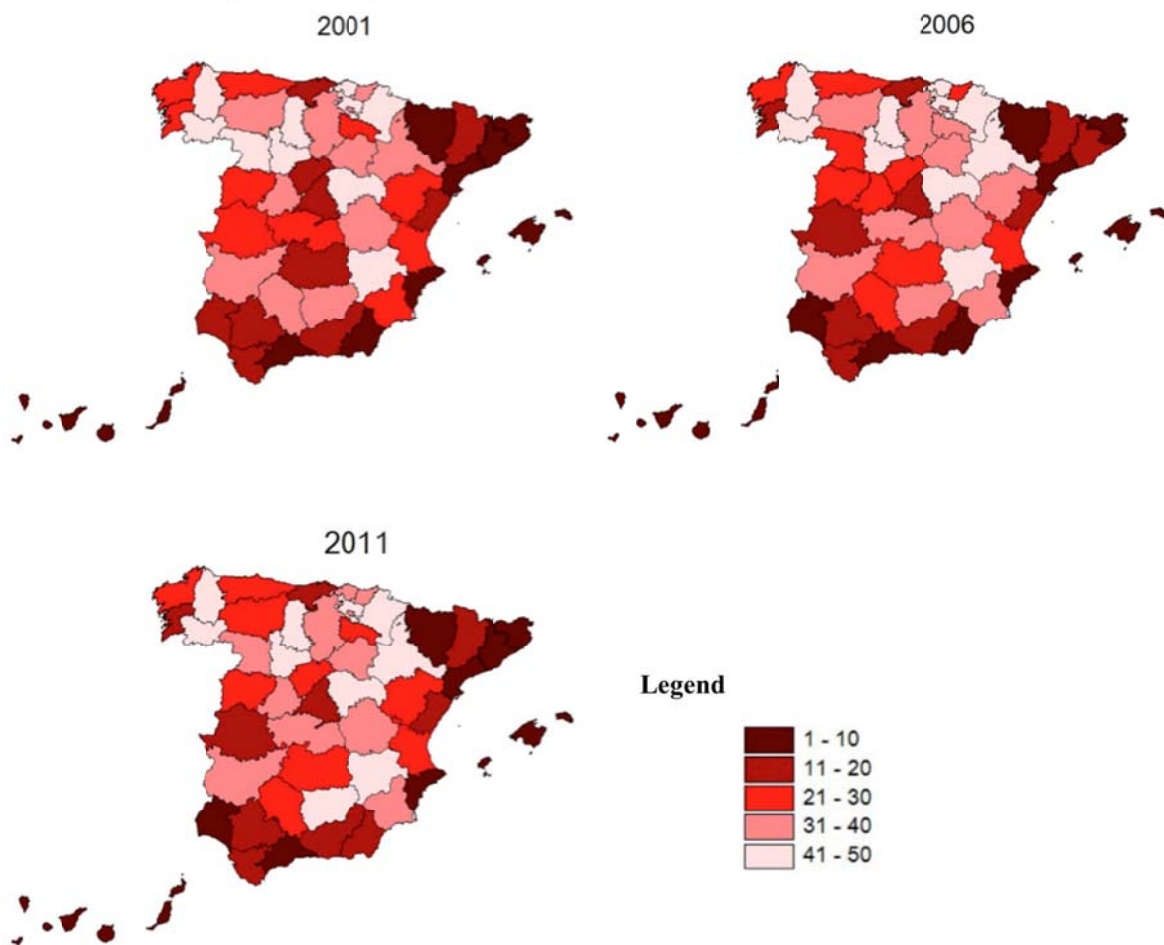
The following positions are occupied mostly by coastal regions in Mediterranean and Andalusia provinces: Girona, Tarragona, Barcelona, Alicante, Malaga, Huelva and Almeria. Girona and Malaga are specialized specially in the international tourism and supply side, whereas Alicante and Tarragona have a higher degree of specialization in domestic tourism. The Barcelona good position is explained by a high specialization in the international tourism arrivals.

Moreover, Table 2 shows that Huelva improved in the last years due to a big enhance in the domestic and international tourism arrivals ranking, and it maintains the good position in the supply side pillar. Instead, Almería left the top ten because its rank worsened in the international tourism although it increases in the supply side ranking. Furthermore, we appreciate that coastal regions in the top ten not have a good position in the amenities pillar except the Archipelagos and Huelva.

Exceptions to coastal regions in the 10 top positions are Huesca, and Lleida (the latter has improved its position over the years). The explanation is that these two provinces are important skiing centers and winter tourism destinations for domestic tourists. Huesca shows also the supply side facilities specialization.

Table 2: PCA ranking Tourism Specialization

	2001	2006	2011
1	Baleares	Baleares	Baleares
2	Tenerife	Tenerife	Las Palmas
3	Las Palmas	Las Palmas	Tenerife
4	Girona	Málaga	Alicante
5	Alicante	Alicante	Málaga
6	Málaga	Girona	Girona
7	Tarragona	Tarragona	Tarragona
8	Huesca	Huelva	Huelva
9	Almería	Huesca	Barcelona
10	Barcelona	Almería	Huesca
11	Lleida	Cádiz	Almería
12	Castellón	Castellón	Madrid
13	Madrid	Barcelona	Castellón
14	Huelva	Granada	Cádiz
15	Granada	Madrid	Granada
16	Cádiz	Lleida	Lleida
17	Sevilla	Cáceres	Cáceres
18	Cantabria	Pontevedra	Sevilla
19	Ciudad Real	Sevilla	Pontevedra
20	Segovia	Cantabria	Cantabria
21	Pontevedra	Coruña (A)	Segovia
22	Valencia	Zamora	Ciudad Real
23	Salamanca	Salamanca	Coruña (A)
24	Toledo	Ciudad Real	Teruel
25	Cáceres	Segovia	Salamanca
26	Coruña (A)	Valencia	Valencia
27	Rioja (La)	Asturias	Cordoba
28	Murcia	Cordoba	Asturias
29	Asturias	Guipúzcoa	León
30	Teruel	Avila	Rioja (La)
31	Cordoba	Toledo	Vizcaya
32	Burgos	Rioja (La)	Avila
33	Avila	Teruel	Guipúzcoa
34	Zaragoza	Badajoz	Toledo
35	León	León	Badajoz
36	Badajoz	Soria	Murcia
37	Cuenca	Cuenca	Soria
38	Jaén	Murcia	Burgos
39	Soria	Burgos	Zamora
40	Guipúzcoa	Jaén	Cuenca
41	Palencia	Palencia	Jaén
42	Zamora	Ourense	Ourense
43	Albacete	Vizcaya	Palencia
44	Vizcaya	Albacete	Zaragoza
45	Valladolid	Lugo	Lugo
46	Navarra	Zaragoza	Albacete
47	Alava	Navarra	Valladolid
48	Ourense	Valladolid	Navarra
49	Guadalajara	Alava	Alava
50	Lugo	Guadalajara	Guadalajara

On the other hand, the last positions have also been quite stable over time. The PCA reveals that internal regions occupy these last positions. These provinces are Guadalajara, Navarra, Valladolid, Alava, Albacete, Lugo, Ourense and Palencia.These regions got the worst marks in international tourism specialization, accommodation facilities, as well as in amenities. Particularly, Palencia, Albacete and Ourense show the lowest degree of tourism specialization for both types, domestic and international tourists whereas, Albacete, Navarra, Valladolid, Alava present the lowest levels of

supply-side specialization. It is worth to mention that most of regions ranking in the last part of the table also show a low level in the amenities pillar. It is remarkable that Guipuzcoa and Vizcaya left their bad positions of 2001, improving their rank in the amenities pillar and becoming specialized in the international arrivals. Instead, Jaen and Zaragoza worsen their positions entering in the last part of the ranking.

In this paper, we only show the results for the years 2001, 2006 and 2011, however, we have calculated the PCA for the rest of the years according to the data available (from 2001 to 2011). The correlation index calculated for the results highlights the stable evolution over time (see Annex, Table A.7 and Table A.8)

For the perfect measure of tourism specialization of tourist arrivals in the Accommodation sector, it would be necessary to include the data referring to rural tourism, campsites, and touristic apartments. In spite of this, we only have data from 2005 to 2011 for rural tourism, so we have to introduce rural tourism data as a sum of the demand and supply-side variables to test if the results change. The outcomes reveal that rankings do not change much, in fact the correlation index is higher than 0.95 if we compare results whether or not rural tourism data from to 2005 to 2011 is included.

Conclusions

The present chapter has provided a comprehensive review of the concept of tourism specialization, as well as its measurements, according to previous literature. We attempt to outline the measurement of this relevant touristic concept from the demand and supply side. This distinction is essential to understand and to study the phenomena. And finally, we also have included another factor which influences both demand and supply side: amenities. As mentioned before, we should increase the absolute figures, and we need to control each measure according to regional size.

Firstly, tourist arrivals influence the level of tourism specialization in each region because many factors fluctuate depending on the type of visitor (length of stay, daily expenditure, travel motivation). Moreover, we have found broad differences between domestic and international tourists. International tourists generally only visit a few Spanish regions: the Balearic and Canary Islands, Madrid, the Catalonian coast, Malaga and Castellón. On the contrary, there is a bigger number of regions specialized in the domestic arrivals (although this type of tourism is very seasonal). The only exception to this model is Huesca, which is a tourism specialized region but following the model of a national skiing destination. Also, we can appreciate a significant domestic tourism specialization in those regions surrounding Madrid.

Secondly, the supply side of tourism has reached different levels of development according to tourist flows. The supply side makes a higher degree of specialization more evident in coastal regions, even in the northern part of Spain. This could Furthermore, the accommodation industry varies throughout the year, since managers adapt offers to the seasonal flow of visitors using variables such as beds, employees or even the closing of establishments during certain times of the year. The main findings show a high seasonal effect on the supply-side industry in coastal regions, the Balearic Islands, Huesca and Girona. The relevant exceptions of seasonality are: the Canary Islands and Madrid, because of the extraordinary climate of the former, and the urban power of the latter.

In order to summarize the information provided by the different indices, we have constructed a synthetic indicator following the Principal Component Analysis methodology. We have carried out these analyses separately for specialization of the tourism sector in Spanish provinces. The rankings obtained for specialization are stable over the temporal sample. PCA demonstrates a clear model of sun and beach tourism, whereas coastal regions are the most touristically specialized. The exceptions to this specialization are Huesca, and recently, Girona, which are skiing destinations for domestic tourists. Regarding the differences between domestic and international tourism, international visitors are concentrated in just a few regions whereas domestic visitors spread out by costal provinces. Finally, it is relevant to highlight that the regions surrounding Madrid are also specialized in domestic flows.

Compared with previous studies, the proposed method to study tourism specialization in Spain is based on data available at a regional level, which enhances the analysis of the tourism sector. In addition, we analyzed the demand side, the supply side and amenities in tourism simultaneously. Because of this, the main implications derived from this analysis may facilitate the estimation of the influence of seasonal and specialization on other economic aspects, e.g. the labor market. The results are valuable for use by a large number of authorities at a national and a local level.

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Annex

Figure A 1: Map showing the Spanish provinces names

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Table A 1: Spanish regions ranking for 2001. Tourism Specialization

Province	Aggregated index	Domestic Tourism	International Tourism	Supply-side	Amenities
Baleares	1	2	1	1	4
Tenerife	2	3	2	3	1
Las Palmas	3	10	3	2	2
Girona	4	4	4	4	20
Alicante	5	1	7	6	10
Málaga	6	6	5	5	17
Tarragona	7	5	8	7	11
Huesca	8	7	21	9	14
Almería	9	11	11	14	8
Barcelona	10	15	6	17	18
Lleida	11	12	27	24	6
Castellón	12	8	19	20	13
Madrid	13	13	9	12	28
Huelva	14	20	28	10	7
Granada	15	19	10	18	12
Cádiz	16	16	12	8	23
Sevilla	17	43	13	23	5
Cantabria	18	9	22	19	31
Ciudad Real	19	50	48	47	3
Segovia	20	18	18	13	33
Pontevedra	21	14	24	22	36
Valencia	22	28	26	31	15
Salamanca	23	21	20	21	35
Toledo	24	45	23	48	9
Cáceres	25	33	37	16	27
Coruña (A)	26	26	25	25	29
Rioja (La)	27	25	30	36	25
Murcia	28	27	36	40	19
Asturias	29	24	42	30	26
Teruel	30	17	44	27	39
Cordoba	31	48	16	45	16
Burgos	32	29	15	11	45
Avila	33	30	33	15	41
Zaragoza	34	35	35	44	22
León	35	38	38	28	32
Badajoz	36	46	46	38	21
Cuenca	37	31	43	39	34
Jaén	38	47	41	46	24
Soria	39	22	40	26	46
Guipúzcoa	40	23	14	32	48
Palencia	41	37	32	34	40
Zamora	42	41	47	33	38
Albacete	43	44	49	50	30
Vizcaya	44	42	17	37	43
Valladolid	45	40	39	41	42
Navarra	46	36	31	42	44
Alava	47	32	29	35	47
Ourense	48	49	50	49	37
Guadalajara	49	34	34	29	50
Lugo	50	39	45	43	49
Kmo		0.5000	0.5808	0.6938	0.4880
Explained variance		0.7178	0.9642	0.6220	0.6356

Table A 2: Correlation between rankings of Tourism Specialization dimensions (2001)

	Aggregated index	Domestic Tourism	International Tourism	Supply side	Amenities
Aggregated index	1				
Domestic Tourism	0.7831*	1			
International Tourism	0.7453*	0.6959*	1		
Supply side	0.7830*	0.8519*	0.7505*	1	
Amenities	0.8111*	0.3629*	0.4570*	0.3694*	1

*$p < 0.5$

Table A 3: Spanish regions ranking for 2006. Tourism Specialization

Province	Aggregated index	Domestic Tourism	International Tourism	Supply-side	Amenities
Baleares	1	1	1	1	4
Tenerife	2	2	3	3	1
Las Palmas	3	4	2	2	2
Málaga	4	7	6	4	9
Alicante	5	3	8	8	11
Girona	6	5	4	5	45
Tarragona	7	6	7	7	22
Huelva	8	13	16	9	6
Huesca	9	8	22	11	18
Almería	10	10	15	14	12
Cádiz	11	14	11	10	19
Castellón	12	9	20	17	15
Barcelona	13	20	5	21	25
Granada	14	17	10	22	13
Madrid	15	11	9	13	42
Lleida	16	16	26	27	10
Cáceres	17	32	41	12	8
Pontevedra	18	15	24	26	16
Sevilla	19	41	13	31	5
Cantabria	20	12	23	20	32
Coruña (A)	21	24	21	28	17
Zamora	22	43	46	6	31
Salamanca	23	18	18	16	30
Ciudad Real	24	50	48	48	3
Segovia	25	23	27	15	29
Valencia	26	27	17	30	21
Asturias	27	22	37	24	26
Cordoba	28	45	25	46	7
Guipúzcoa	29	19	12	32	39
Avila	30	28	34	19	37
Toledo	31	46	29	47	14
Rioja (La)	32	26	28	36	33
Teruel	33	21	44	25	44
Badajoz	34	49	47	39	20
León	35	37	36	29	36
Soria	36	25	42	18	48
Cuenca	37	31	43	35	34
Murcia	38	34	33	45	27
Burgos	39	30	19	23	47
Jaén	40	48	45	43	24
Palencia	41	40	35	38	35
Ourense	42	44	49	44	28
Vizcaya	43	29	14	50	38
Albacete	44	47	50	49	23
Lugo	45	35	39	37	43
Zaragoza	46	38	32	42	40
Navarra	47	33	31	41	46
Valladolid	48	42	40	40	41
Alava	49	39	30	34	49
Guadalajara	50	36	38	33	50
Kmo		0.5000	0.5257	0.7354	0.5504
Explained variance		0.7453	0.9540	0.6475	0.6875

Table A 4: Correlation between rankings of Tourism Specialization dimensions (2006)

	Aggregated index	Domestic Tourism	International Tourism	Supply-side	Amenities
Aggregated index	1				
DomesticTourism	0.7914*	1			
International Tourism	0.7243*	0.7836*	1		
Supply-side	0.8140*	0.8161*	0.6051*	1	
Amenities	0.6867*	0.2610	0.3407*	0.2788*	1

*p<0.5

Table A 5: Spanish regions ranking for 2011. Tourism Specialization

Province	Aggregated index	Domestic Tourism	International Tourism	Supply-side	Amenities
Baleares	1	3	1	2	8
Las Palmas	2	4	2	1	2
Tenerife	3	1	3	3	1
Alicante	4	2	9	6	12
Málaga	5	8	6	4	14
Girona	6	6	5	5	28
Tarragona	7	5	8	9	20
Huelva	8	9	18	7	6
Barcelona	9	18	4	13	26
Huesca	10	11	21	8	15
Almería	11	7	24	12	11
Madrid	12	12	7	11	42
Castellón	13	10	25	17	16
Cádiz	14	13	12	10	23
Granada	15	16	10	20	10
Lleida	16	20	32	28	9
Cáceres	17	29	40	19	7
Sevilla	18	44	14	30	4
Pontevedra	19	15	27	25	19
Cantabria	20	14	22	23	33
Segovia	21	24	23	14	29
Ciudad Real	22	50	49	49	3
Coruña (A)	23	27	20	27	18
Teruel	24	17	38	16	38
Salamanca	25	19	15	24	37
Valencia	26	28	16	29	21
Cordoba	27	45	19	47	5
Asturias	28	25	36	22	36
León	29	35	35	26	31
Rioja (La)	30	26	30	35	32
Vizcaya	31	23	13	43	40
Avila	32	30	34	21	41
Guipúzcoa	33	21	11	36	46
Toledo	34	49	31	48	13
Badajoz	35	46	43	38	17
Murcia	36	36	41	40	24
Soria	37	22	45	18	48
Burgos	38	31	17	15	47
Zamora	39	42	44	32	30
Cuenca	40	37	42	34	35
Jaén	41	48	46	46	22
Ourense	42	43	48	41	27
Palencia	43	40	37	42	34
Zaragoza	44	38	33	39	39
Lugo	45	33	29	31	44
Albacete	46	41	50	50	25
Valladolid	47	39	39	37	43
Navarra	48	32	28	45	45
Alava	49	34	26	44	49
Guadalajara	50	47	47	33	50
Kmo		0.5000	0.5180	0.7066	0.5042
Explained variance		0.7191	0.9483	0.6479	0.6638

Table A 6: Correlation between rankings of Tourism Specialization dimensions (2011)

	Aggregated index	DomesticTourism	InternationalTourism	Supply-side	Amenities
Aggregated index	1				
Domestic Touristm	0.8090*	1			
International Tourism	0.7240*	0.7391*	1		
Supply-side	0.8116*	0.8665*	0.6514*	1	
Amenities	0.6746*	0.2463	0.2776	0.2764	1

*$p < 0.5$

Table A 7: Correlation Index for the aggregated Tourism Specialization Rankings

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
2001	1										
2002	0.9873*	1									
2003	0.9879*	0.9939*	1								
2004	0.9811*	0.9802*	0.9890*	1							
2005	0.9669*	0.9740*	0.9861*	0.9905*	1						
2006	0.9378*	0.9469*	0.9612*	0.9749*	0.9851*	1					
2007	0.9509*	0.9630*	0.9735*	0.9827*	0.9905*	0.9827*	1				
2008	0.9424*	0.9583*	0.9672*	0.9740*	0.9853*	0.9753*	0.9937*	1			
2009	0.9344*	0.9503*	0.9620*	0.9672*	0.9812*	0.9691*	0.9881*	0.9957*	1		
2010	0.9468*	0.9560*	0.9673*	0.9756*	0.9856*	0.9707*	0.9891*	0.9950*	0.9957*	1	
2011	0.9552*	0.9646*	0.9710*	0.9759*	0.9843*	0.9670*	0.9879*	0.9928*	0.9905*	0.9945*	1

Table A 8: Correlation Index for the aggregated Tourism Seasonality Rankings

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
2001	1										
2002	0.9614*	1									
2003	0.9204*	0.9398*	1								
2004	0.9371*	0.9588*	0.9519*	1							
2005	0.9210*	0.9490*	0.9472*	0.9459*	1						
2006	0.8821*	0.9128*	0.9444*	0.9104*	0.9579*	1					
2007	0.9090*	0.9246*	0.9325*	0.9163*	0.9698*	0.9588*	1				
2008	0.9161*	0.9275*	0.9195*	0.9026*	0.9430*	0.9116*	0.9589*	1			
2009	0.8106*	0.8481*	0.9004*	0.8769*	0.9010*	0.8870*	0.9261*	0.9086*	1		
2010	0.7657*	0.8123*	0.8638*	0.8368*	0.8917*	0.8828*	0.9154*	0.8694*	0.9716*	1	
2011	0.8959*	0.8992*	0.9164*	0.8936*	0.9348*	0.9294*	0.9473*	0.9470*	0.8816*	0.8676*	1

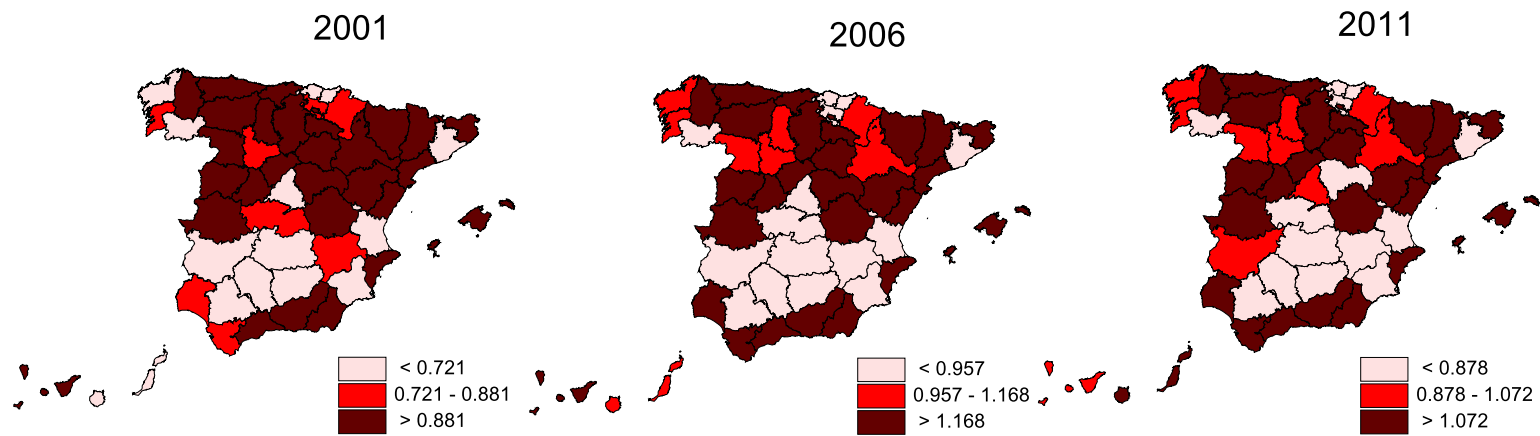**Map A 1: Tourism Density Ratio for National Tourists (TDR)**
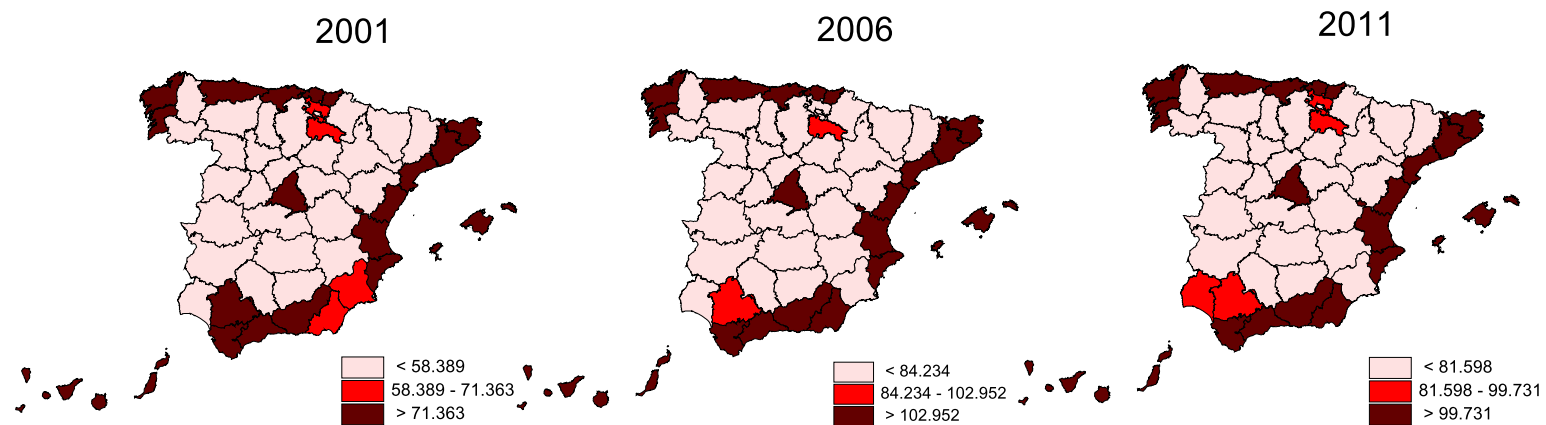
Source: Own elaboration based on HOS (INE)

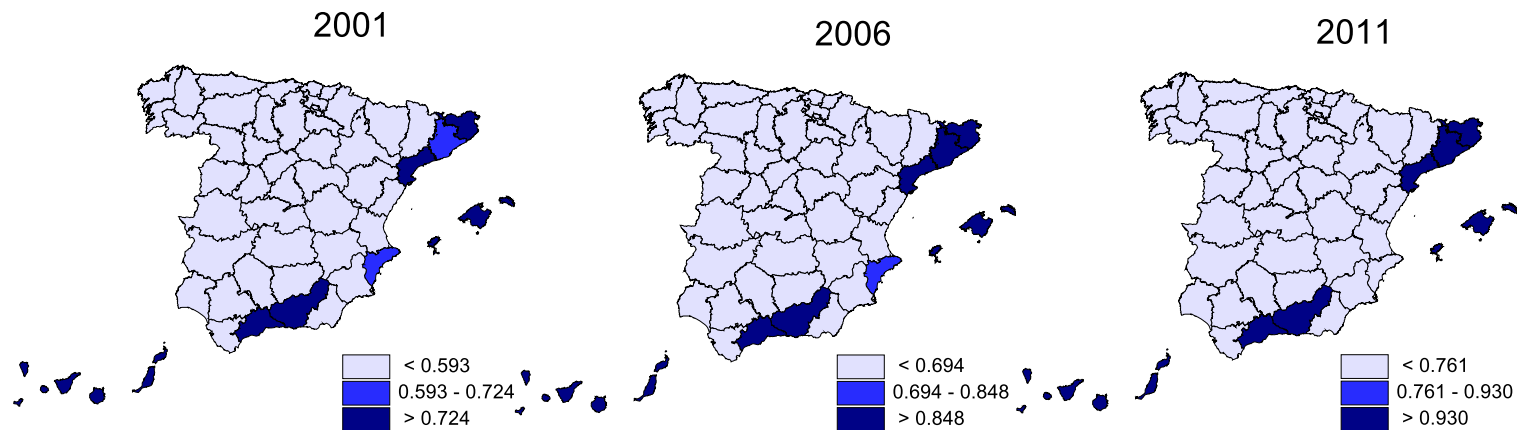**Map A 2: Tourism Density Ratio for Foreign Tourists (TDR)**
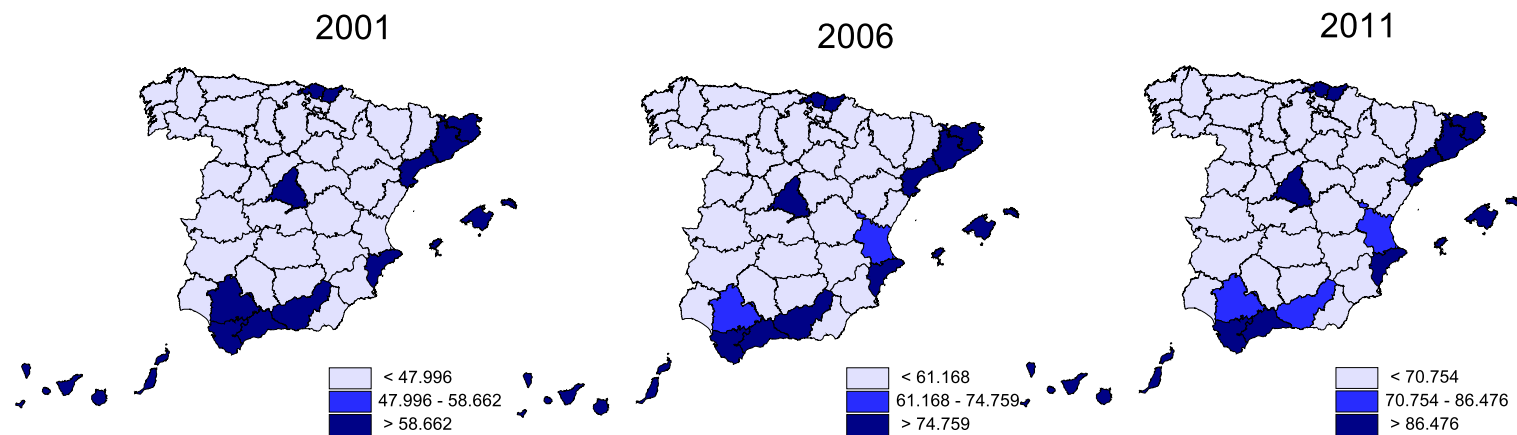
Source: Own elaboration based on HOS (INE)

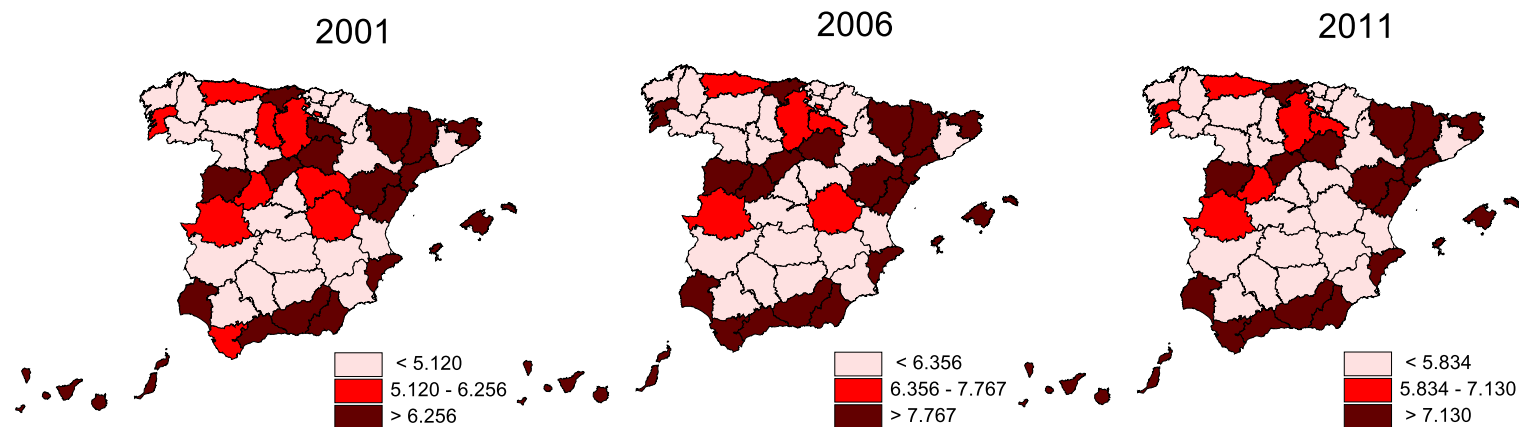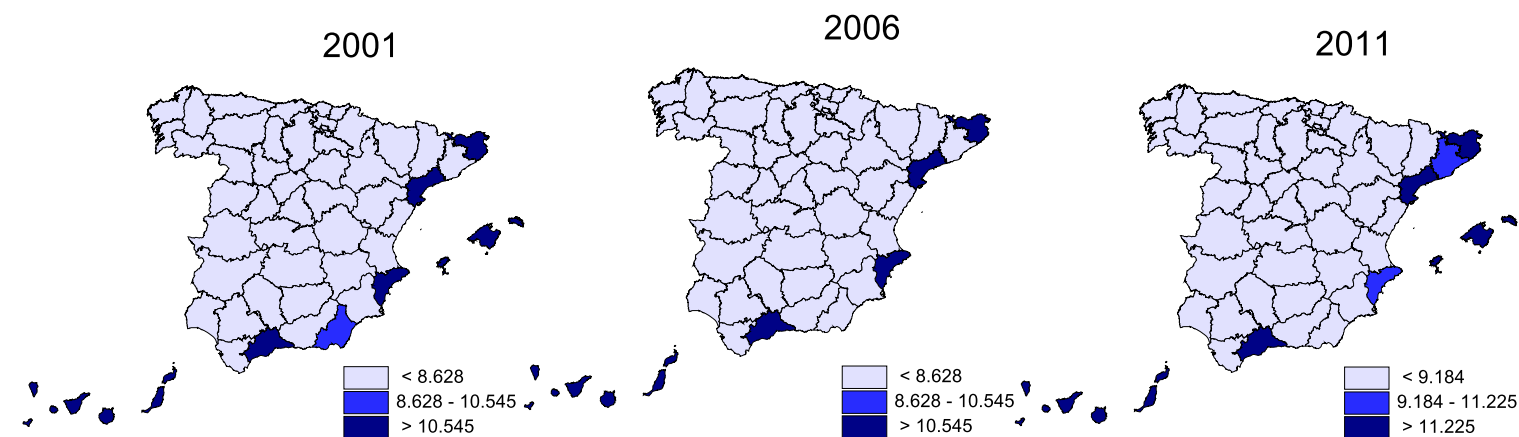**Map A 3: Tourism Intensity Ratio for National Tourists (TIR)**

2001   2006   2011

	< 0.721
	0.721 - 0.881
	> 0.881

	< 0.957
	0.957 - 1.168
	> 1.168

	< 0.878
	0.878 - 1.072
	> 1.072

Source: Own elaboration based on HOS (INE)

Map A 4: Tourism Intensity Ratio for Foreign Tourists (TIR)

2001   2006   2011

	< 0.593
	0.593 - 0.724
	> 0.724

	< 0.694
	0.694 - 0.848
	> 0.848

	< 0.761
	0.761 - 0.930
	> 0.930

Source: Own elaboration based on HOS (INE)

Map A 5: Tourism Penetration Index for Spanish Tourists (TPR)

2001   2006   2011

< 5.120	
5.120 - 6.256	
> 6.256	

< 6.356	
6.356 - 7.767	
> 7.767	

< 5.834	
5.834 - 7.130	
> 7.130	

Source: Own elaboration based on HOS (INE)

Map A 6: Tourism Penetration Index for Foreign Tourists (TPR)

2001   2006   2011

< 8.628	
8.628 - 10.545	
> 10.545	

< 8.628	
8.628 - 10.545	
> 10.545	

< 9.184	
9.184 - 11.225	
> 11.225	

Source: Own elaboration based on HOS (INE)

Map A 7: Augmented Tourism Density Ratio for Spanish Tourists (ATDR)
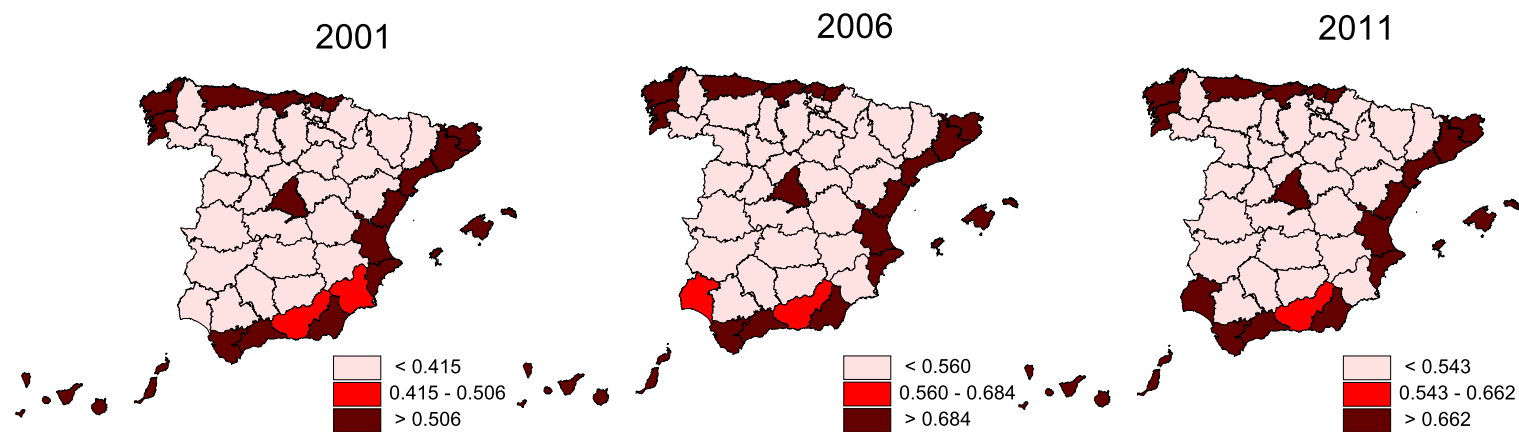
Source: Own elaboration based on HOS (INE)

Map A 8: Augmented Tourism Density Ratio for Foreign Tourists (ATDR)
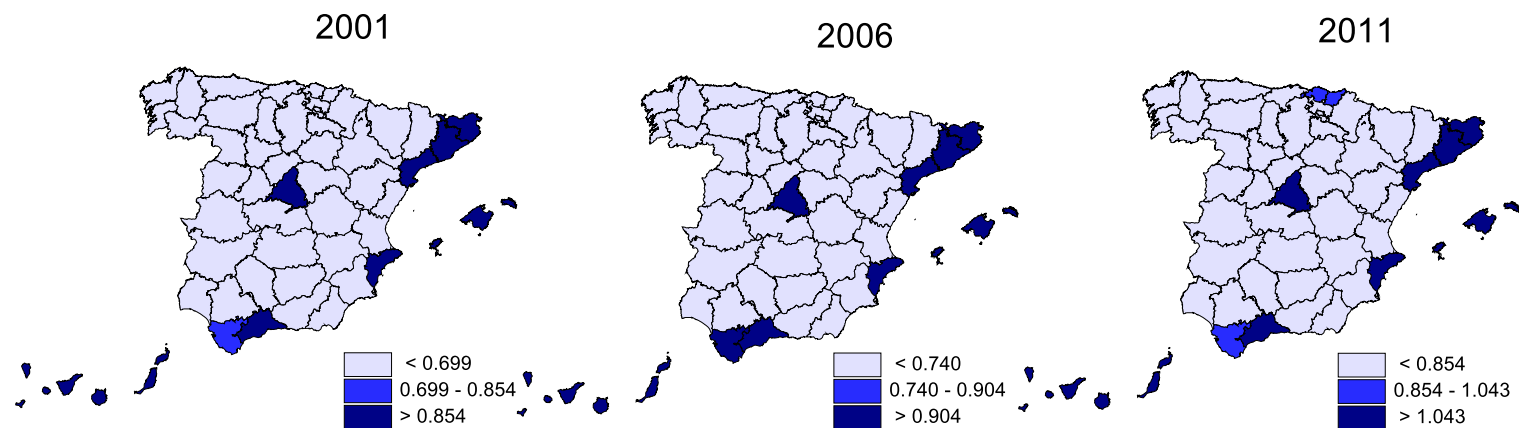
Source: Own elaboration based on HOS (INE)

Map A 9: Tourist Concentration Index for Spanish Tourist (TCI)
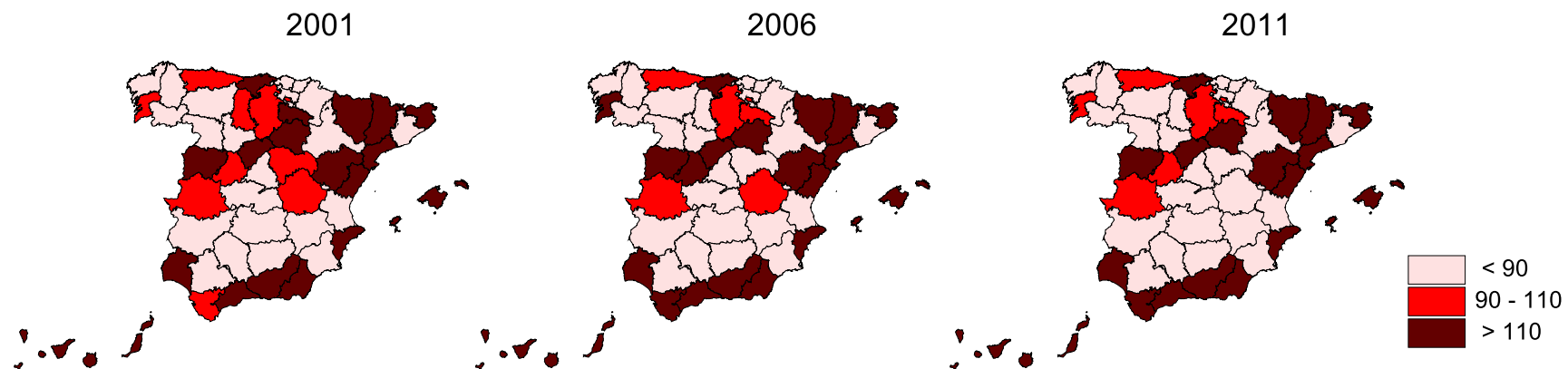
Source: Own elaboration based on HOS (INE)

Map A 10: Tourist Concentration Index for Foreign Tourist (TCI)
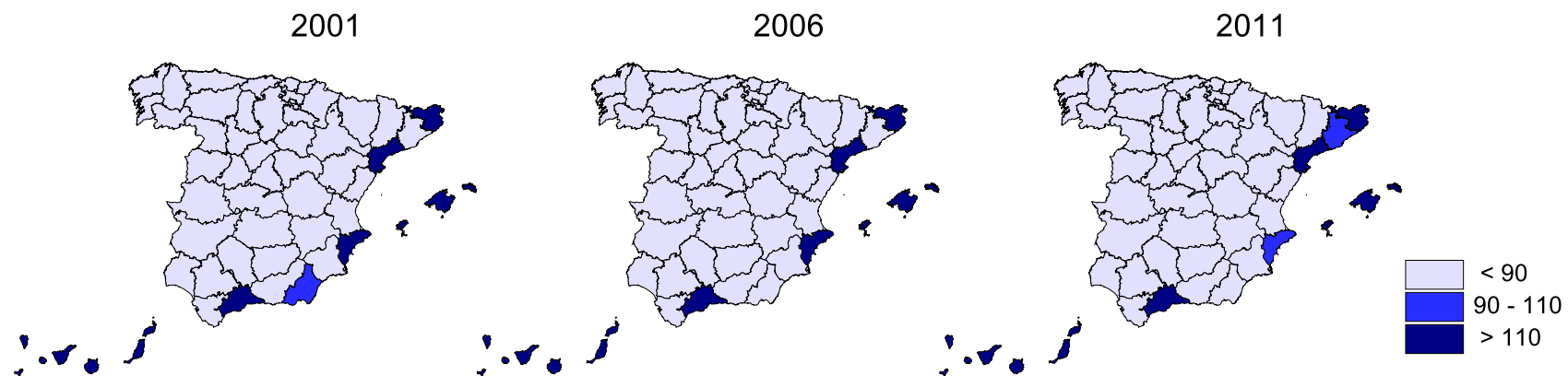
Source: Own elaboration based on HOS (INE

Map A 11: Function Index (FI)
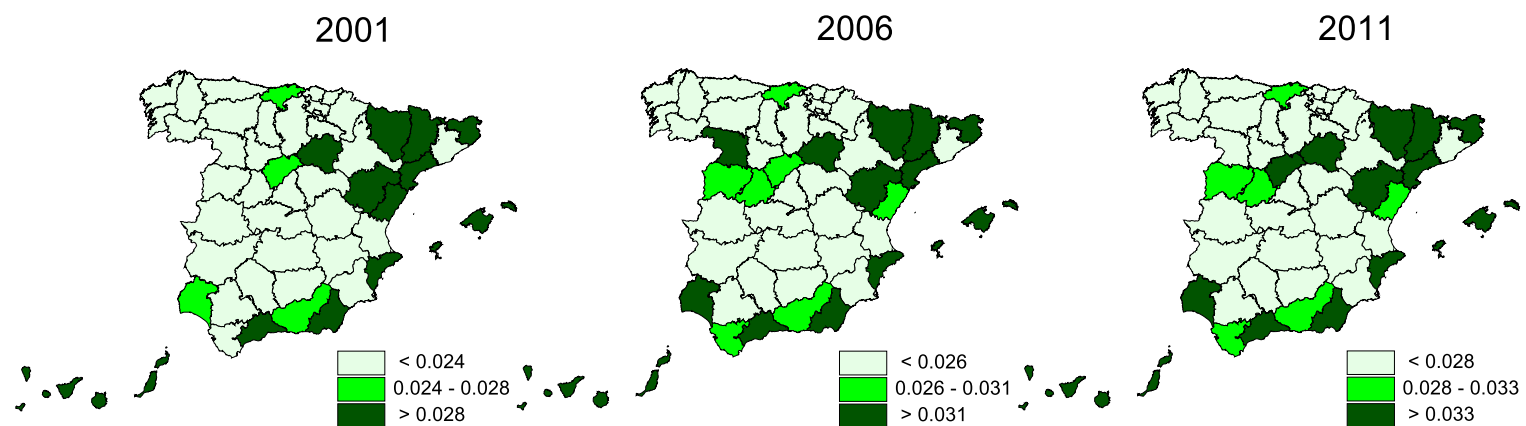
Source: Own elaboration based on HOS (INE)

Map A 12: Room Index (RI)
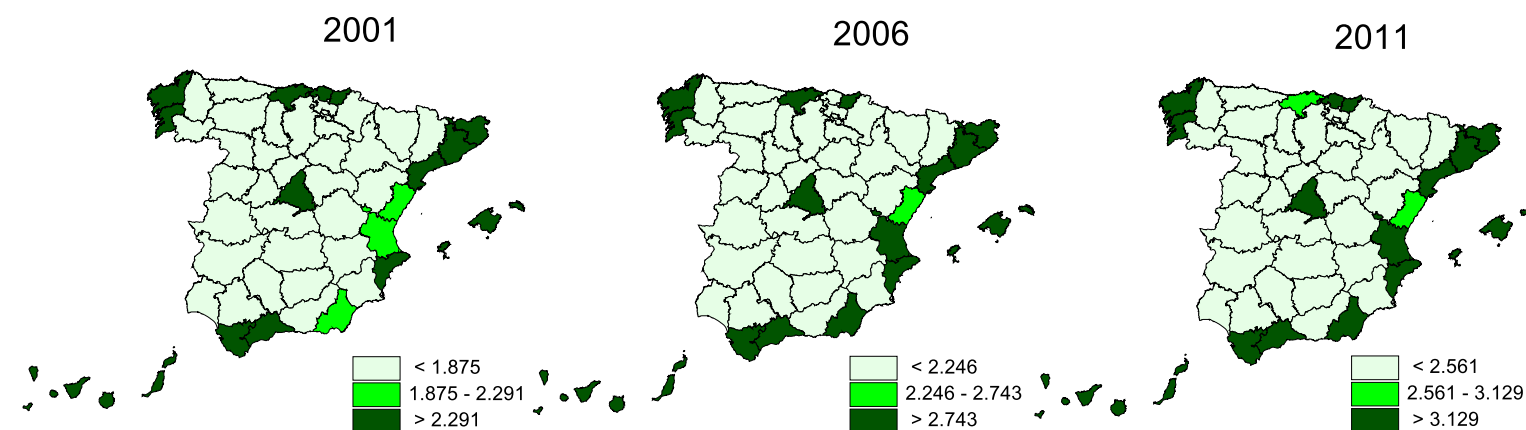
Source: Own elaboration based on HOS (INE)

Map A 13: Relative Beds by Establishment (RBE)
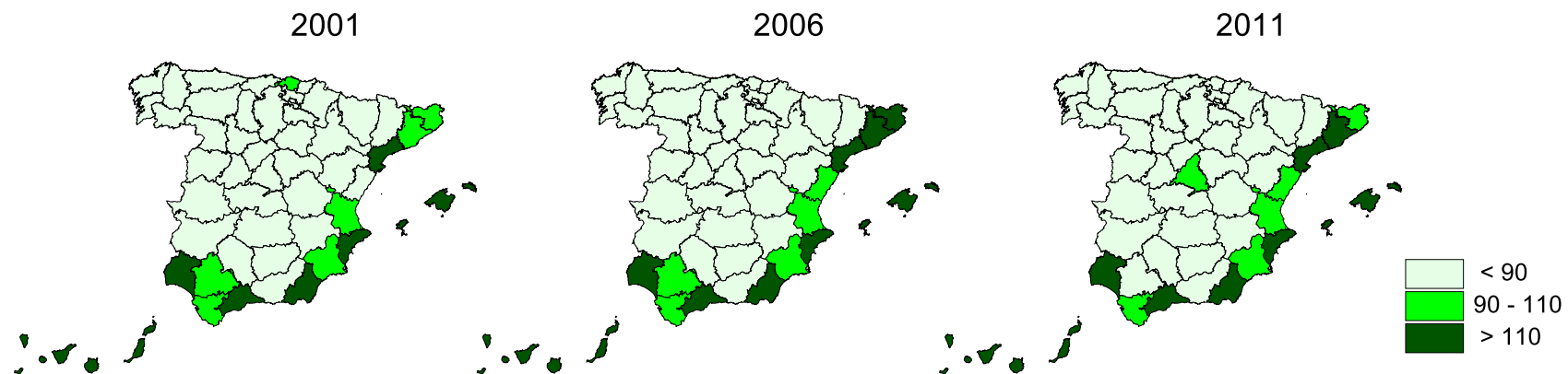
Source: Own elaboration based on HOS (INE)

Map A 14: Employment Location Quotient (ELQ)
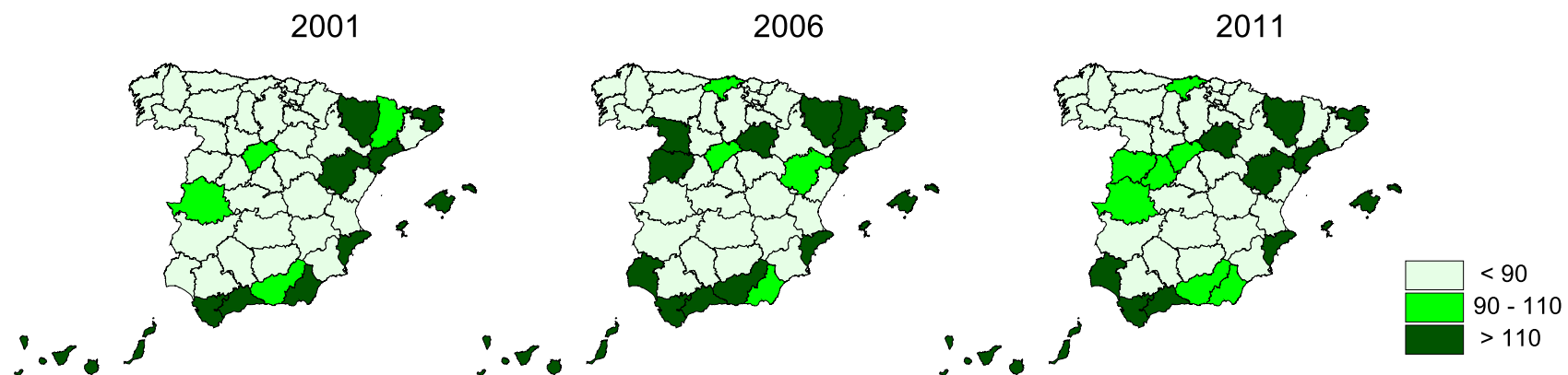
Source: Own elaboration based on HOS (INE)

**Map A 15: Establishments in Hotels and Restaurans Location Quotient**

2001	2006	2011

Legend:
- < 90
- 90 - 110
- > 110
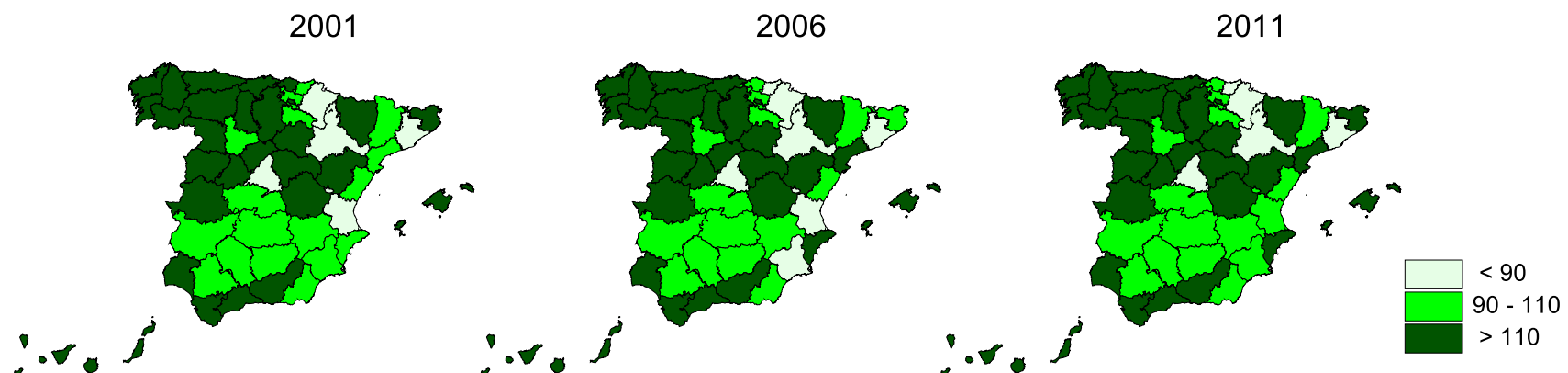
Source: Own elaboration based on Central Business Register (INE)

Map A 16: Establishments in Amusent, Cultural and Sports Location Quotient

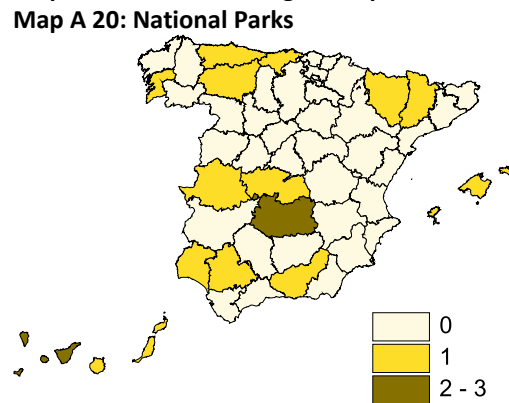| 2001	2006	2011

Legend:
- < 90
- 90 - 110
- > 110
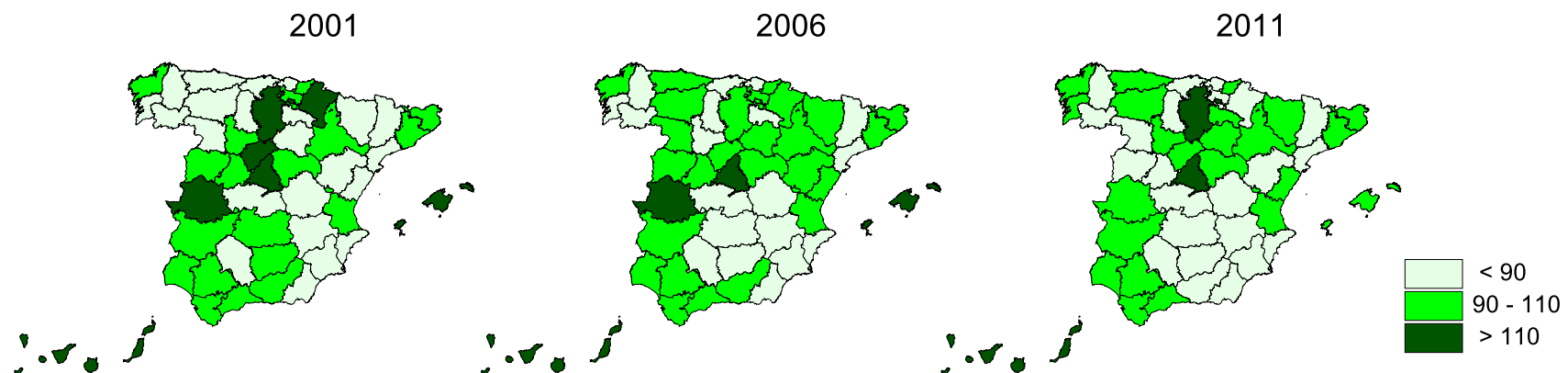
Source: Own elaboration based on Central Business Register (INE)

Map A 17:Annual Average Temperature
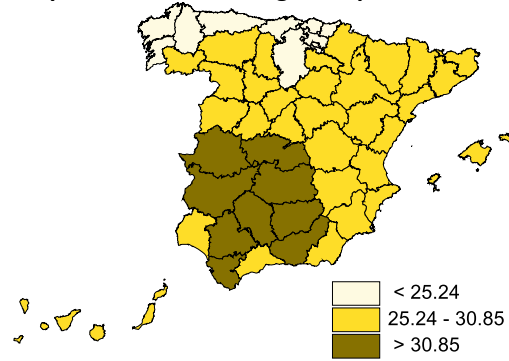
Source: Own elaboration based on AEMET
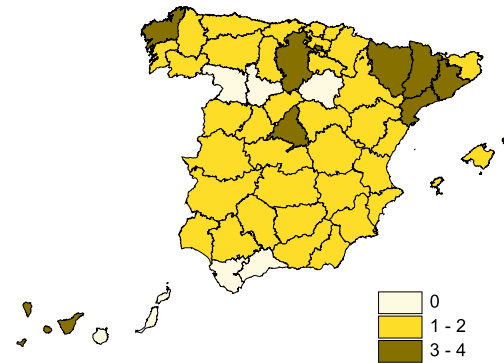
Map A 18: Annual Average Precipitation
Map A 20: National Parks

Source: Own elaboration based on Ministry Agriculture and Environment data.
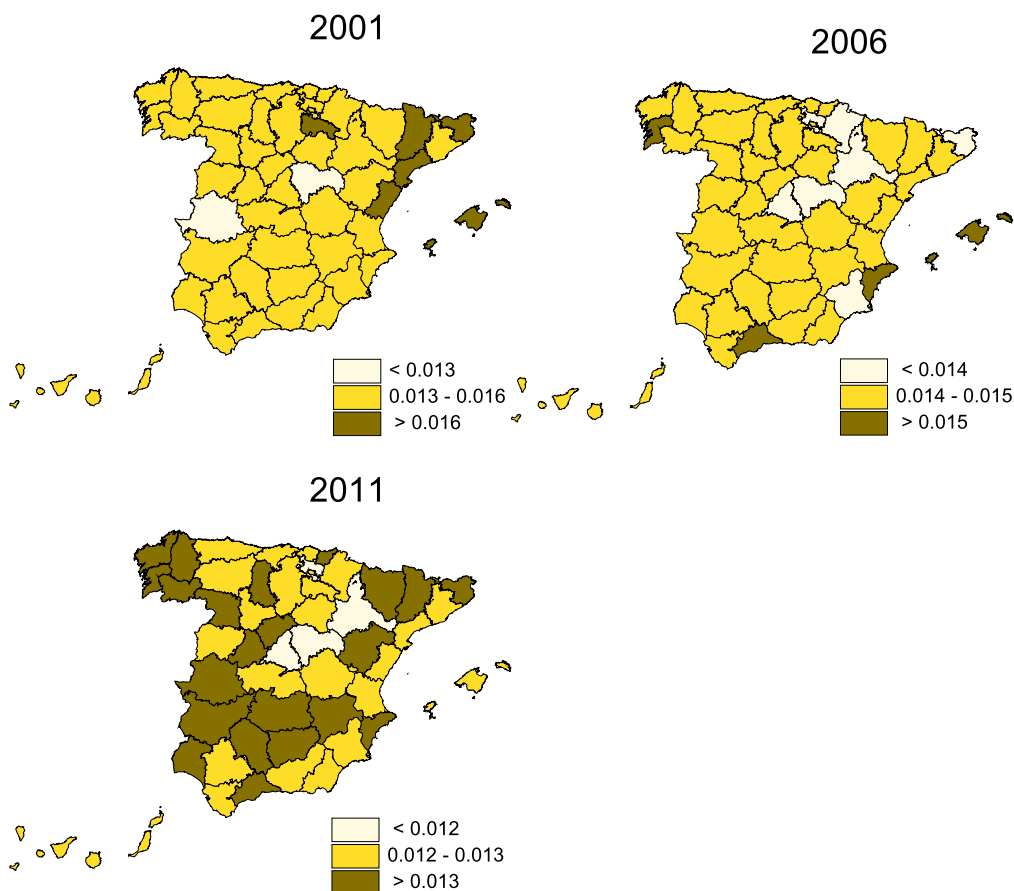

Source: Own elaboration based on AEMET.
Map A 19: Unesco World Heritage

Source: Own elaboration based on World Heritage list.

Map A 21: Shops by Habitant

2001

2006

	< 0.013
	0.013 - 0.016
	> 0.016

	< 0.014
	0.014 - 0.015
	> 0.015

2011

	< 0.012
	0.012 - 0.013
	> 0.013

Source: Own elaboration based on HOS (INE)

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[1] Amenities are considered to be specific characteristics linked to a certain region.

[2] An area should be declared a National Park when it is representative of the natural system, has a large surface in order to permit the natural and ecological processes, presents little intervention in its natural territory, being uninhabited within the area, and being surrounded by an area that could be declared as peripheral protection area.

[3] Note that tourism sector have been very important to employ foreign workers in Spain during the inmigration boom.

[4] See Annex: From Table A.1 to Table A.6.

[5] Figure A1 in the Annex show the spacial distrubution of the Spanish provinces.

[6] It is calculated as the quotient between the number of nights and the number of tourists.

[7] Extra beds are therefore are not included and double beds are equal to two vacancies.

[8] In the case of the central part of Spain the ratio could be higher given that the population is very low.

[9] See tables in the Annex for more details about the Rankins in the four pillars.