

On the Determinants of International Tourism Demand Flow: A Regional Analysis for Spain

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Abstract

This study analyses the determinants of international tourism demand in Spain. To this end, it examines the 17 Spanish regions (at the NUTS-2 level) over the period 2001–2022. Unlike much of the existing literature, which approaches tourism from a national perspective, this work adopts a regional focus. Using dynamic panel data models (System-GMM), the analysis employs three alternative measures of tourism demand: one related to tourism activity (absolute international tourist arrivals), another to tourism intensity (number of tourists per capita), and a third to tourism density (number of tourists per square kilometre). The results indicate that tourism demand exhibits a persistent but moderate dynamic, and that factors such as regional GDP, relative prices, hotel infrastructure, and certain destination characteristics (beaches, cultural assets) significantly influence international tourist attraction. Moreover, the study finds that uncertainty negatively affects tourism demand. The robustness analysis reveals notable differences between tourist and non-tourist regions, underscoring the need for differentiated regional policies to promote more balanced tourism development.

Key Words: tourism demand, regional analysis, Spain, dynamic panel data model

JEL Classification: C33, F41, L83

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1. Introduction

Over the past few decades, tourism has emerged as one of the most dynamic and fastest-growing sectors worldwide (Nadeem et al., 2020; Yenisehirlioglu et al., 2020). Despite the significant impact of the COVID-19 pandemic on tourism activity between 2020 and 2023, global tourism reached pre-pandemic levels in terms of international tourist arrivals in 2024. Moreover, revenues generated by international tourism have surpassed pre-pandemic levels in most destinations (UN Tourism, 2025).

The arrival of tourist flows to a given geographic area has a substantial economic impact on the local economy, as the expansion of tourism activity acts as a driver of economic growth in receiving destinations (Alcalá-Ordóñez et al., 2024; Brida et al., 2016). Tourism demand originates in the tourist's place of residence—where income is earned—and is directed toward a destination where part of that income is spent. As such, it constitutes the central element from which various economic impacts are generated in the host destination (Schubert et al., 2011; Song & Li, 2008).

Therefore, tourism demand plays a key role in the management of tourist destinations, as well as in the design of tourism planning policies (Song et al., 2012). In a globalized context marked by intense competition among tourist destinations—where the choice of one destination implicitly excludes others—understanding the factors and causes that determine tourists' destination choices is essential for tourism stakeholders (Rosselló & Santana, 2022).

In general, the factors influencing tourism demand can be classified into motivators and determinants. While motivators relate to psychological aspects that explain why people travel and the needs they seek to satisfy, determinants aim to identify the factors that explain a tourist's choice of destination (Dreshaj et al., 2022).

Alongside the exponential growth of international tourism demand in recent decades, there has been increasing interest in the academic literature in identifying the determinants that influence tourists' destination choices (Song et al., 2019). Understanding tourism demand has become a central objective of numerous studies that seek to pinpoint its key drivers (Brida & Scuderi, 2013).

The identification of tourism demand determinants has attracted considerable attention in the economic literature on tourism (Goh & Law, 2011; Song & Li, 2008; Song et al., 2019). However, tourism demand models differ substantially in terms of selected variables, data used, empirical methodologies applied, and destinations analyzed (Dogru et al., 2017).

In this regard, the analysis of tourist flows at the sub-national level has received limited attention from both tourism policymakers and the academic literature on tourism demand (Zamparini et al., 2017). This is despite the fact that a regional-level approach would account for the uneven distribution of international tourist arrivals across different territories within a country (Ognjanov et al., 2018), and thus, the determinants of tourism demand may also vary at the regional level (Guardia et al., 2014).

In Spain, tourism demand has evolved unevenly across regions (Alcalá-Ordóñez et al., 2023), and the country is characterized by a high degree of decentralization of tourism-related competencies in favor of regional governments (Pulido & Cárdenas, 2012). Therefore, the formulation of tourism policies targeting tourism demand requires analyses that adopt a regional perspective—an approach that remains relatively scarce and, when present, tends to focus on specific types of tourism or exclusively on domestic tourism. This gap in the literature provides an opportunity for the present study to offer an innovative perspective by analysing the determinants of international tourism demand at the regional level in Spain.

The objective of this study is to analyze the determinants of international tourism demand in Spanish regions. To do so, it uses data for the 17 Spanish regions at the NUTS-2 level, according to the European Union's Nomenclature of Territorial Units for Statistics, for the period 2001–2022. The analysis identifies the relevant explanatory variables and specifies three distinct models using three alternative measures of tourism demand: international tourist arrivals (as a measure of tourism activity), international arrivals per capita (as a proxy for tourism intensity), and international arrivals per square kilometre (as a measure of tourism density). In all cases, the results are estimated using a dynamic panel data model (System-GMM), which addresses the endogeneity issues typically associated with panel data models.

The paper is organized as follows: the next section reviews the empirical literature on the determinants of tourism demand, discusses issues related to the measurement of tourism demand, and provides a brief overview of the situation in Spain. Section three details the methodological approach used in the analysis, including the econometric model. Section four presents the data. Section five discusses the empirical results and their interpretation. Finally, the concluding section offers key findings and provides some policy recommendations based on the results obtained.

2. Literature review

The analysis of tourism demand has traditionally attracted considerable attention within the academic literature that examines tourism from an economic perspective. In this regard, the earliest studies—considered pioneering contributions to this line of research—emerged in the 1960s (Gray, 1966; Guthrie, 1961; Keintz, 1968; Laber, 1969). Since then, interest in the topic has grown steadily among both researchers and destination managers. However, the most significant advances in this field have occurred since the 1990s, with the more frequent incorporation of econometric techniques into the analysis of tourism demand (Song et al., 2012).

This growing importance of empirical research on tourism demand has led to the development of several systematic review studies, which help to identify the key aspects of this research area. These reviews have contributed to identifying the main variables used to measure tourism activity, the factors most commonly analyzed, the methodological developments employed, and the destinations studied (Crouch, 1994; Goh & Law, 2011; Rosselló & Santana, 2022; Song & Li, 2008; Song et al., 2019; Witt & Witt, 1995).

2.1 Measuring tourism

From a theoretical perspective, the dependent variable in a tourism demand model should be represented by the quantity of the product demanded (Crouch, 1994). However, from a practical standpoint, tourism is not a conventional variable that reflects a quantifiable amount; rather, it is typically measured by aggregating various activities in monetary terms (Rosselló & Santana, 2022). As such, the measurement of tourism poses a conceptual and methodological challenge (Smeral, 1988).

Tourism involves the movement of individuals—referred to as tourists or excursionists—to places outside their usual environment for personal, professional, or business purposes, during which they engage in activities that generate tourism-related expenditure (UN Tourism, 2025). Within the framework of international trade theory, tourism exhibits certain peculiarities: it constitutes a tradable good that may or may not involve the physical mobility of demanders, and it includes services that are traditionally considered non-tradable (Porto, 2005). In this case, the product moves not toward the consumer, but rather the consumer toward the product (Monfort-Mir, 2011).

In this context, most empirical studies on tourism demand have used, with some exceptions, the number of tourists as the dependent variable (Rosselló & Santana, 2022; Song et al., 2019). Moreover, the majority of these studies focus on international tourism flows, largely due to greater data availability compared to domestic tourism (Brida & Scuderi, 2013). As a result, relatively few studies have examined domestic travel (Song et al., 2019).

Additionally, tourism demand analyses have commonly employed national-level aggregate data as the dependent variable. Only a limited number of studies have utilized regional-level data, despite the fact that tourism demand can vary considerably across regions within the same country—even among geographically proximate areas (Rosselló & Santana, 2022; Álvarez-Díaz et al., 2020). As such, aggregating demand data at the national level can result in biased estimates (Zamparini et al., 2017).

Consequently, the academic literature in this field exhibits a notable gap due to the scarcity of regionally focused studies. This is especially significant given that, except in the case of small island states or microstates, the expansion of tourism demand within a country tends to occur unevenly across regions (Ognjanov et al., 2018). Thus, the regional level constitutes the most appropriate scale for empirical analysis (Bassil et al., 2023), since the determinants of tourism demand may differ substantially at the subnational level (Guardia et al., 2014).

2.2 Identifying the determinants of tourism demand

Given the vast number of studies in the academic literature devoted to identifying the determinants of tourism demand, it is impossible to present all of the variables that have been analyzed

(Rosselló & Santana, 2022). However, the inclusion of such variables in empirical analyses has generally been justified by consumer behaviour theory (Song & Witt, 2000).

“Although in recent years researchers have begun to introduce new regressors to tailor demand models to their specific research objectives (Dogru et al., 2017; Dreshaj et al., 2022), including aspects such as digital marketing strategies and consumer engagement through social media platforms (Ahmed & Ismail, 2020), the analysis of tourism demand has traditionally focused on economic variables aimed at explaining changes in the number of tourist arrivals (Zamparini et al., 2017). In this regard, the economic variables most commonly used in empirical studies—both for the destination and the countries of origin—include income levels, typically measured by GDP; price levels, measured via inflation; the degree of economic integration, captured by trade openness; and currency valuation, represented by exchange rates (Goh & Law, 2011; Rosselló & Santana, 2022; Song et al., 2019).

Nevertheless, the literature has increasingly incorporated supply-side variables in recent years. These include the tourism supply capacity of destinations—and even its quality—as well as natural attractions such as coastline availability, natural areas, or cultural resources, and climate or environmental conditions at the destination (Albadalejo & González, 2018; Álvarez-Díaz et al., 2020; Noonan, 2023; Özdemir & Tosun, 2023).

Another important aspect that has recently gained attention in empirical analyses is the historical trend of tourism flows, particularly the persistence of tourist habits and the influence of previous visitors' recommendations (Morley, 2009). In other words, prior tourist demand is used as an explanatory variable for current demand, leading to the adoption of dynamic demand models (Albadalejo & González, 2018; Ulucak et al., 2020).

Finally, certain variables related to political and contextual aspects of the destination—such as safety levels (Ulucak et al., 2020) or the impact of terrorism (Voltes-Dorta et al., 2016)—have also been incorporated in some studies. Similarly, geographic variables such as the distance between the origin market and the tourist destination (Sun & Lin, 2019) or the connectivity of the destination (Muhammad & Andrews, 2016) have been included in several analyses.

However, in the relatively limited number of studies that have analyzed tourism demand at the subnational level, researchers have highlighted the difficulty of obtaining complete datasets at this scale. As a result, the choice of both economic and non-economic variables is often constrained by data availability (Álvarez-Díaz et al., 2020; Guardia et al., 2014; Zamparini et al., 2017).

2.3 Tourism demand analysis using Spain as a case study

The growing interest in analysing tourism demand has led to the development of a substantial body of research in this field. Some of these studies have focused on Spain as a case study. However, the majority have analyzed aggregate national-level demand, which does not account for the significant regional differences within the country (Borrego-Domínguez et al., 2022; Garín-Muñoz & Pérez Amaral, 2000; Rey et al., 2011).

Nonetheless, there are also studies that, while using Spain as a case study, examine tourism demand at the subnational level. For instance, Garín-Muñoz (2007) focuses exclusively on Germany as the country of origin; Guardia et al. (2014) consider only domestic tourist arrivals; Priego et al. (2015) also analyze domestic tourism demand; Jiménez-García et al. (2017) focus on just four source markets—Germany, Italy, France, and the United Kingdom; Albadalejo & González (2018) study only 11 provinces along the Mediterranean coast; Álvarez-Díaz et al. (2020) adopt a provincial-level analysis and identify the determinants of domestic tourism demand; Gómez-Vega & Herrero-Prieto (2017) examine only tourism flows primarily motivated by culture; and Millán et al. (2018) focus solely on flows of tourists attracted by olive oil tourism.

3. Methods

3.1 Model specifications

Analysing the determinants of tourism demand requires understanding not only its main drivers but also its dynamic nature, since tourists' decisions cannot be fully captured by a static decision-making process. Past experiences and behaviours influence a potential tourist's choice to visit a particular destination.

In this regard, a general linear model aimed at explaining the number of tourists received by a given destination—such as the Spanish regions—should include not only destination-specific characteristics (fixed effects) but also current and past determinants, as well as the inherent dynamics of tourist arrivals (dynamic effects). This leads to a dynamic panel data framework typically estimated using Ordinary Least Squares (OLS). However, the dynamic nature of the dependent variable introduces endogeneity problems due to the presence of fixed effects and potential simultaneity between the number of tourists and some of the included explanatory variables, rendering OLS estimates inconsistent.

Arellano & Bover (1995) and Blundell & Bond (1998) propose a solution to this issue through a modification of the Difference-GMM estimator originally developed by Arellano & Bond (1991). Their approach is based on a system of equations that combines the level and differenced forms of the model, using lagged values of the dependent variable from one equation as instruments for the other.

Specifically, the estimable model seeks to explain the behavior of tourism demand, measured by international tourist arrivals to each Spanish region over the study period, incorporating both its dynamic structure and its key determinants, as expressed in Equation (1).

$$TA_{it} = \alpha + \sum_{j=1}^J \beta_j TA_{it-j} + \sum_{k=1}^K \gamma_k X^{(k)}_{it} + \varepsilon_{it} \quad (1)$$

Where:

TA_{it} is the dependent variable, representing the number of international tourist arrivals to region i in period t .

TA_{it-j} captures the dynamic component of international tourist arrivals, where j lags of the variable explain its current values.

$X^{(k)}_{it}$ denotes the k exogenous variables or determinants of tourism demand in region i at time t .

ε_{it} is the error term associated with the model, where $\varepsilon_{it} \sim N(0, \sigma^2)$. It includes a fixed effects component and an idiosyncratic error component.

The OLS estimation highlights endogeneity issues arising from the correlation between the lags of international tourist arrivals and the fixed effects component of the error term. This problem may also extend to a potential correlation between the dynamic component of tourism and the idiosyncratic error.

To address this, and by employing dynamic panel econometric techniques such as System GMM, the determinants of tourism demand in Spain are analyzed at the regional level, using selected macroeconomic variables as well as destination-specific characteristics.

To eliminate fixed effects, the model is transformed into first differences:

$$\Delta TA_{it} = \alpha + \sum_{j=1}^J \beta_j \Delta TA_{it-j} + \sum_{k=1}^K \gamma_k \Delta X^{(k)}_{it} + \Delta \varepsilon_{it} \quad (2)$$

This specification addresses the correlation between the lags of the dependent variable and the fixed effects. However, correlations with the idiosyncratic error term may still persist, such that $E(\Delta TA_{it-j} \Delta \varepsilon_{it}) \neq 0$. In this context, the literature suggests instrumenting ΔTA_{it-j} with TA_{it-j} , with $j \geq 2$ (assuming exogeneity of the tourism demand determinants X , both in levels and in first differences).

Consequently, returning to Equation (1) ΔTA_{it-j} is used as an instrument for TA_{it-j} . The System-GMM method thus consists of a system of two equations: the main equation in levels, and an auxiliary equation in first differences. This approach provides appropriate instruments to mitigate the inconsistency of estimators caused by endogeneity issues inherent to dynamic panel data models.

3.2 Data and variables definition

To carry out the present analysis—which aims to identify, from a regional perspective, the determinants of international tourism demand in Spain—the first step is to define how these international tourism flows (i.e., the dependent variable) are to be measured. In line with the predominant approach in the academic literature, this study uses the number of international tourists received in each of the Spanish regions. Additionally, to better capture and standardize tourism demand behavior, two complementary indicators are considered: tourism intensity and tourism density. These are derived by normalizing international tourist arrivals by population and surface area, respectively.

It is also necessary to define the countries of origin to be analyzed, as it is not feasible to obtain data for all countries that send tourists to Spain due to data availability constraints. In this regard, the 14 main source markets for which data are available have been selected: Germany, Belgium, Denmark, Finland, France, Ireland, Iceland, Italy, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, and Switzerland. These countries accounted for approximately 80% of total international tourism demand received in Spain during the first two decades of this century (INE, 2024).

As for the determinants of tourism demand (i.e., the independent variables), the objective is to include the largest possible number of explanatory variables, compiling those that have already been used in previous studies, while acknowledging the limitation that not all of them are available at the regional level. Therefore, the analysis incorporates both traditional economic variables—although exchange rates are excluded, given that most of the selected source markets and Spanish regions share a common currency—as well as additional variables related to tourism supply. These include supply-side capacity, natural attractions, and the level of uncertainty associated with global pandemics. Specifically, GDP per capita is used as a measure of economic activity, along with the degree of trade openness of the regions. Prices are captured through a relative price index comparing local prices with those of the 14 main countries of origin ($PCI / \frac{1}{14} \sum_{x=1}^{14} PCI_x$). Regarding tourism supply, the analysis includes the number of available hotel beds and the number of officially recognized cultural heritage assets. Additionally, by combining tourism supply with geographical factors—such as the number of kilometers of coastal areas or beaches and the surface area of natural spaces available in each region—the model captures various dimensions of tourism supply, reflecting different types of tourism that tourists may seek.

Finally, the analysis incorporates the World Pandemic Uncertainty Index (WPUI), an index that reflects the level of uncertainty associated with pandemic-related crises, such as the peak period of COVID-19. This variable captures atypical effects linked to demand restrictions, both nationally and regionally.

Accordingly, the study uses only those variables for which data are available across all NUTS-2 regions of Spain, according to the Nomenclature of Territorial Units for Statistics of the European Union. Ceuta and Melilla are excluded, despite being classified at the same regional level, due to the lack of data for most of the variables considered. Therefore, the analysis includes a total of 17 regions. The specific variables used, along with the databases from which they are drawn and their availability, are detailed in Table 1.

Table 1. Variables analysed, databases and availability

Variable	Description	Source	Availability
Tourism	International tourists' arrivals	Frontur	1997-2023
Pop	Population	INE	1995-2023

Surface	Surface	INE	-
GDP	Per capita real Gross Domestic Product	INE	1995-2022
PCI	Price Consumption Index (2021=100)	INE	1995-2023
Accommodations	Number of beds	INE	2001-2023
Beach_km	Kilometers of coastal areas (beaches)	IGN	-
Natural_lands_km	Kilometers of natural lands	IGN	-
Cultural	Cultural Goods of Interest	CulturaBase	2000-2022
PCI_x	Price Consumption Index of country x	Eurostat	1996-2023
WPUI	World Pandemic Uncertainty Index	WUI	1996-2023

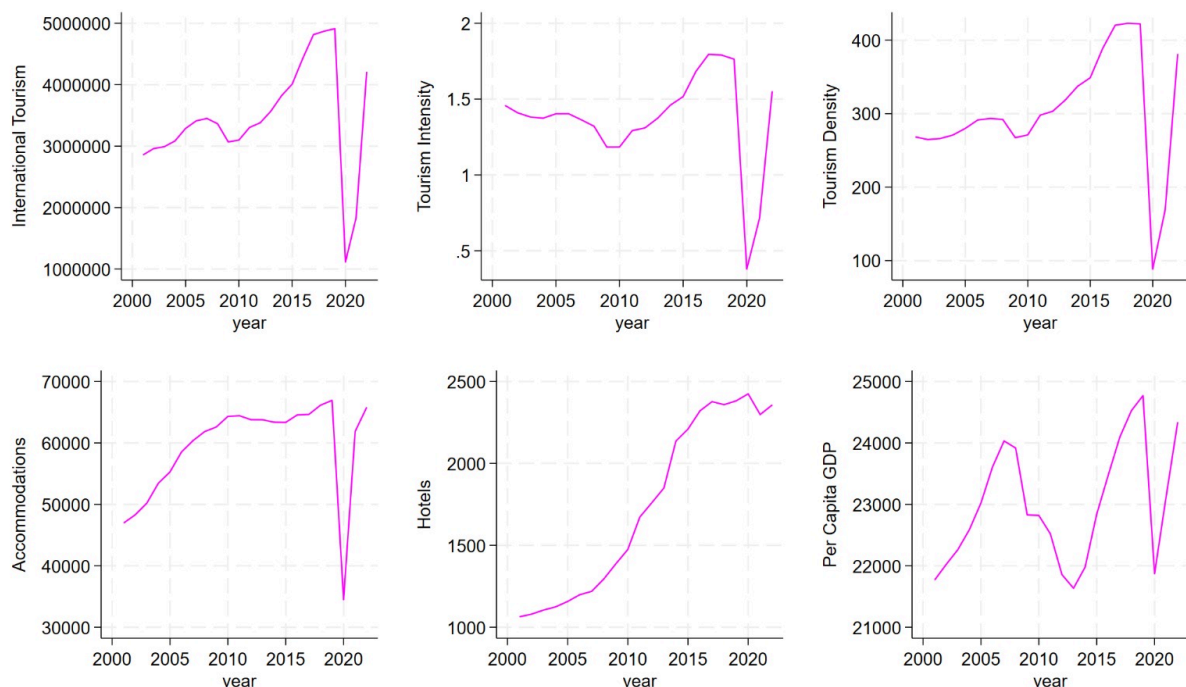
Source: own elaboration.

Specifically, the following data sources have been used: (i) Frontur, which measures tourist movements at Spain's borders and is compiled by the National Statistics Institute (INE)—prior to 2015, it was produced by Turespaña; (ii) the National Statistics Institute (INE), the official agency responsible for public statistics in Spain; (iii) the National Geographic Institute (IGN), an official body under the Spanish Ministry of Transport; (iv) CulturaBase, the statistical dissemination system of the Spanish Ministry of Culture; (v) Eurostat, the official statistical office of the European Commission; and (vi) the World Pandemic Uncertainty Index, compiled by the International Monetary Fund.

Taking into account the availability of data for the variables used, the period analyzed in this study covers the years 2001 to 2022, representing a time horizon of 22 years.

3.3 Tourism demand in Spain

Figure 1. Evolution of the average number of international arrivals, tourism density and intensity, number of hotels, accommodation capacity, and real GDP per capita



Source: own elaboration.

In the case of Spain, tourism activity is a key pillar of the national economy. In 2023, the country received 85 million international tourists, with tourism contributing 12.3% to the national GDP—

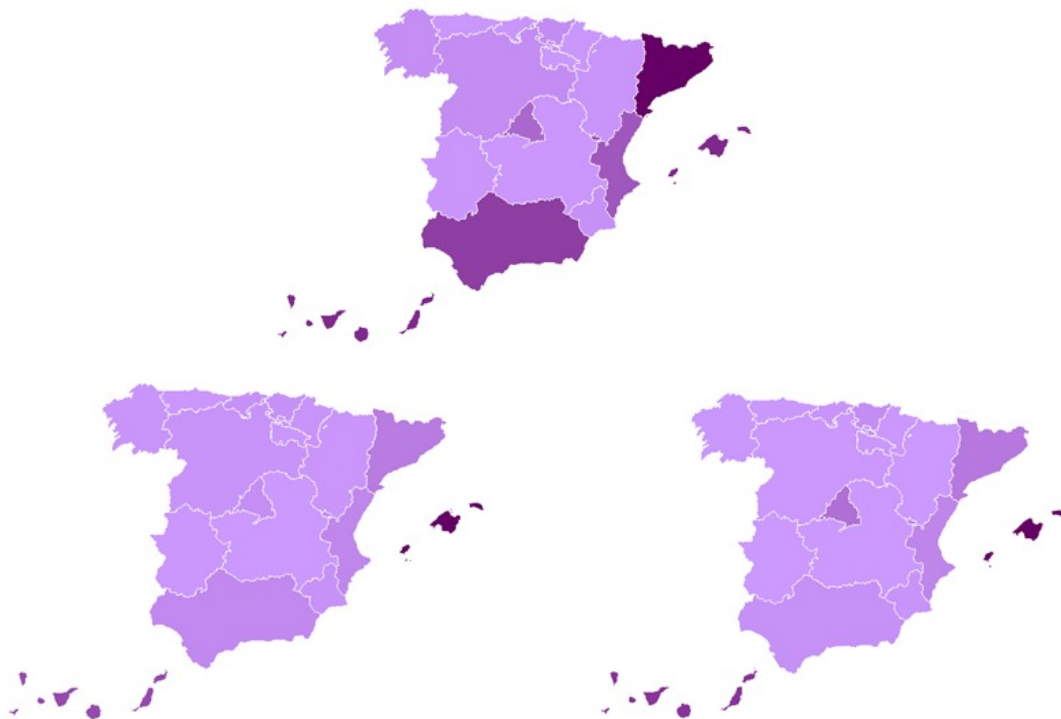
equivalent to more than 184 billion euros. Additionally, the sector generated 2.5 million jobs, accounting for 11.6% of total employment in the country (INE, 2024). Since the late 20th century, tourism activity in Spain has shown a consistent upward trend across various indicators, as illustrated in Figure 1.

However, when tourism indicators are analyzed at the regional level, significant disparities become evident. In 2022, 90% of international tourist arrivals in Spain were concentrated in just six regions—Andalucía, the Islas Baleares, Islas Canarias, Catalonia, Madrid, and Comunidad Valenciana—out of a total of 17 autonomous communities. These regions, with the exception of Madrid, are either coastal or insular, indicating that a large share of tourism in Spain is characterized by sun-and-beach tourism.

These most touristic regions also tend to have the highest GDP levels in general terms, meaning that, in addition to hosting the majority of international tourism, they also concentrate a significant portion of the country's overall economic activity.

In this regard, Figure 2 illustrates the substantial regional differences in international tourist arrivals across Spain. Given these disparities, the present study adopts a regional-level approach to analyze international tourism demand, regardless of the type of accommodation used by foreign tourists visiting Spain.

Figure 2. **Map of averages for international tourism for the period 2001–2022**



Note: top panel: international arrivals, bottom left panel: intensity, bottom right panel: density.
Source: own elaboration.

4. Results

4.1 Descriptive statistics and variable construction

Based on the data for the variables analyzed in this study, Table 2 presents the main descriptive statistics as well as the newly constructed variables that are incorporated into the analysis.

Traditionally, the total number of tourists is used as a measure of tourism demand. However, there is a growing trend in the literature toward using alternative indicators that better reflect the degree of tourism specialization in each destination (Ghosh, 2020).

In this regard, in addition to the total number of international tourists received by each region, tourism intensity and tourism density are increasingly being adopted as relevant measures within the tourism sector (Alcalá-Ordóñez et al., 2023). Thus, alongside the use of total tourist arrivals as an indicator of tourism activity, this study also considers: (i) tourism intensity, which adjusts the number of tourists by the size of the resident population in the destination; and (ii) tourism density, which adjusts the number of tourists by the geographical area of the destination.

Table 2. Descriptive statistics of main variables.

Variable	Obs	Mean	Std. dev.	Min	Max
Tourism	374	3,447,544	4,665,533	33141,37	19,400,000
Intensity	374	1.369	2.453	0.05	11.91
Density	374	302.99	573.38	1.207	2774.759
Pop	374	2,668,109	2,379,937	276,200	8,519,100
Surface	374	29,764.59	29,597.11	4992	94,224
GDP	374	22,995.48	4,552.826	13,911.96	34,987.33
PCI	374	88.52	9.93	65.1	110.12
Accommodations	374	59,319.38	62,734.91	3659	258,049
Beach_km	374	461.2353	550.1359	0	1,583
Natural_lands_km	374	2,336.266	3,384.427	241.31	15,084.49
Cultural	374	1,738.623	1,931.623	154	10,167
WPUI	374	1.53	4.18	0	17.23

Source: own elaboration.

On average, a region in Spain receives approximately 3.4 million tourists per year, with an absolute minimum observed during the COVID-19 pandemic, followed by a rapid recovery—highlighting one of the emerging patterns in the tourism sector: its resilience.

In terms of destination carrying capacity, tourism intensity data show that a region receives, on average, 1.4 tourists per 100 inhabitants. Regarding tourism density, each region receives an average of 302 tourists per square kilometre. With respect to tourism supply, regions had an average of 60,000 hotel beds during the period analyzed.

However, these average figures for tourism demand and supply mask substantial regional disparities. As previously mentioned, six regions report values well above these national averages.

It is also worth noting that, from a dynamic perspective, all tourism indicators—both supply- and demand-related—exhibit an overall upward trend throughout the period studied, with a sharp contraction in 2020 due to the COVID-19 pandemic, during which historical lows were recorded.

4.2 Empirical analysis

Based on the previously described data, this section presents the results of the different estimations regarding the dynamics of tourism demand and its determining factors.

Following the conventional literature, international tourist flows received in each Spanish region are used as a measure of tourism demand, accounting for their inherent dynamics. These dynamics also serve as instruments in the System-GMM estimation, helping to address potential inconsistencies arising from endogeneity. Table 3 summarizes the estimated results. The economic value added of each region,

as well as the price ratio between each Spanish region and the main source markets (which are also potential competitor destinations for international tourists), are evaluated as potential demand-side determinants.

From the supply perspective, the number of hotel beds reflects the tourism supply capacity of a destination, which can play a key enabling role—especially in regions not traditionally specialized in tourism (Alcalá-Ordóñez et al., 2023). Furthermore, different types of tourism are considered to explore tourist preferences: the number of kilometers of coastal areas, the extent of natural spaces, and the number of officially recognized cultural heritage assets are used to approximate the profile of tourists in terms of their preferences for sun-and-beach tourism, nature tourism, or cultural tourism, respectively. Lastly, the global pandemic uncertainty index is included as a proxy for perceived threats to tourism consumption.

Table 3. Estimated results (System-GMM)

(international tourism)	Tourism	Tourism Intensity	Tourism Density
l_tourism (-1)	0.389*** (0.017)		
l_intensity (-1)		0.297*** (0.017)	
l_density (-1)			0.489*** (0.02)
l_GDP	1.452*** (0.142)	1.852*** (0.131)	0.304*** (0.091)
Prices	-0.065*** (0.005)	-0.064*** (0.004)	-0.062*** (0.006)
l_accommodations	0.99*** (0.051)	0.563*** (0.047)	0.927*** (0.075)
l_beach_km	0.109** (0.011)	0.116*** (0.010)	0.157*** (0.014)
l_natural_lands_km	-0.211*** (0.069)	-0.248*** (0.065)	-1.057*** (0.073)
l_cultural	0.019*** (0.008)	0.014** (0.007)	0.018** (0.009)
WPUI	-0.031*** (0.002)	-0.042*** (0.002)	-0.031*** (0.002)
Constant	-9.273*** (1.520)	-17.48*** (1.45)	-2.19 (1.67)
N = n*T	357	357	357
N	17	17	17
T	21	21	21
Wald chi-sq	6,154.74***	4,120.86***	4,728.80***

Note: *10%; **5%; ***1% (significance level). Standard deviation in brackets.

Source: own elaboration.

The results reveal the presence of a dynamic component in tourism that depends on its own past values, although with relatively low inertia. Specifically, when the number of international tourists increases by 1% in the previous year, 0.389% of that growth carries over into the current period when total international arrivals are considered. This inertia is slightly higher when measuring international tourism by density—tourists per square kilometre (0.489%)—and lower when measured by intensity—tourists per 100 inhabitants (0.297%).

The higher dynamic dependence observed in tourism density suggests that regions with high international tourism density tend to maintain their relative inflow over time. This may be due to the ability of the most popular destinations to sustain consistent tourist arrivals, supported by factors such as consolidated infrastructure, unique attractions, or strong international reputations.

Although dynamic dependence is significant, it is lower for tourism intensity, suggesting that the ratio of tourists to the local population may be more volatile. This could reflect changes in community carrying capacity or population growth dynamics. The strong persistence in tourism density highlights the importance of territorial planning to manage potential pressure on local infrastructure and resources.

Meanwhile, the lower inertia in tourism intensity may reflect greater sensitivity to changes in preferences, economic conditions, or public policies.

Among the determinants of tourism demand, price levels and income play a key role. Income represents part of tourists' budget constraints, while relative prices influence the opportunity cost of tourism compared to alternative goods or services. Tourism is observed to be relatively inelastic: when prices in Spain increase relative to its main source markets, international tourists reduce visits to some autonomous communities in favour of alternative destinations. The estimates show that a unit increase in the relative price index results in a decline of 6.5% in total international tourist arrivals, 6.4% in tourism intensity, and 6.2% in tourism density.

Regional income, measured through GDP per capita, shows a strong positive effect: an elasticity of 145.2% in total international tourists, 185.2% for tourism intensity, and 30.4% for tourism density.

Tourism supply, proxies by the number of hotel beds, also shows a positive relationship across all three tourism demand indicators—ranging from 0.563% to 0.99%, depending on the metric used. This suggests that greater availability of hotel infrastructure facilitates the attraction of international tourists and contributes to higher inflows.

Finally, the level of pandemic-related uncertainty plays a significant and negative role, reducing tourism demand by approximately 5% for each unit increase in the index.

4.3 Robustness check

To provide robustness to the results obtained, the analysis proceeds with a partition of the regions into “touristic” and “non-touristic” communities. Based on each indicator, it is possible to clearly identify regions with significantly higher levels of tourism compared to others. This classification, proposed by Cárdenas García et al. (2024), aims to capture the heterogeneities that may arise when differentiating between destinations. Andalucía, Cataluña, Islas Canarias, Islas Baleares, Madrid, and Comunidad Valenciana are identified as the six “touristic” regions in terms of both total tourism and tourism intensity. However, Andalucía is not included in this group when considering tourism density, due to its large geographical size.

Table 4 presents the System-GMM estimation results of tourism demand for each of the two regional groupings.

Table 4. **Estimated results, by tourism specialization partition (System-GMM).**

(international tourism)	Tourism	Tourism Intensity	Tourism Density	Tourism	Tourism Intensity	Tourism Density
	Touristic regions			Non-touristic regions		
l_tourism (-1)	0.101*** (0.023)			0.401*** (0.023)		
l_intensity (-1)		0.194*** (0.027)			0.342*** (0.025)	
l_density (-1)			0.413*** (0.04)			0.35*** (0.023)
l_GDP	1.366*** (0.171)	0.908*** (0.209)	0.495* (0.305)	1.359*** (0.154)	1.632*** (0.152)	2.129*** (0.153)
Prices	-0.052*** (0.005)	-0.028*** (0.006)	-0.013 (0.009)	-0.051*** (0.006)	-0.053*** (0.006)	-0.052*** (0.005)
l_accommodations	0.321*** (0.056)	0.104 (0.067)	0.383*** (0.102)	0.471*** (0.065)	0.185*** (0.064)	0.149** (0.066)
l_beach_km	0.189*** (0.012)	0.313*** (0.016)	0.197*** (0.029)	0.079*** (0.013)	0.049*** (0.012)	0.176*** (0.014)
l_natural_lands_km	-0.236*** (0.062)	-0.586*** (0.075)	-1.077*** (0.22)	0.28*** (0.077)	0.118 (0.074)	0.07 (0.066)

l_cultural	-0.054*** (0.003)	-0.058*** (0.003)	-0.04*** (0.005)	-0.04*** (0.002)	-0.046*** (0.002)	-0.046*** (0.002)
WPUI	0.011 (0.009)	-0.008 (0.011)	0.014 (0.016)	0.024* (0.009)	0.02** (0.009)	0.019** (0.009)
Constant	2.461 (1.911)	-4.323* (2.323)	2.339 (3.409)	-8.106*** (1.723)	-15.019*** (1.718)	-16.945*** (1.636)
N = n*T	126	26	105	231	231	252
N	6	6	5	11	11	12
T	21	21	21	21	21	21
Wald chi-sq	1641.62***	2006.15***	478.51***	2259.16***	1265.41***	2415.29***
Note: *10%; **5%; ***1% (significance level). Standard deviation in brackets.						

Source: own elaboration.

The dynamic effects of tourism remain consistent when disaggregating between touristic and non-touristic regions, across all three indicators considered. Income elasticity of tourism is significantly higher in the 11 non-touristic regions (12 in the case of tourism density), indicating that tourism behaves as a superior or luxury good in areas where tourism demand is not yet highly developed.

The results are robust in terms of price elasticity of tourism demand and the effect of tourism supply, proxies by the number of available hotel beds. The main differences arise in the role of geographic factors across touristic and non-touristic regions. These distinctions highlight structural differences between communities with established tourism industries and those with more nascent development.

Sun-and-beach tourism and cultural tourism remain significant drivers of demand in both types of regions. However, when it comes to the role of natural spaces, the availability of natural areas does not appear to be a relevant factor in explaining either tourism intensity or density. This may be due to several factors, such as limited international promotion of nature-based destinations, accessibility challenges, or the more domestic orientation of tourism associated with natural areas. In this regard, natural resources do not yet appear to serve as a key driver of international tourism demand.

It is important to note that, from a methodological perspective, this disaggregation involves a limitation in terms of sample size. When focusing on touristic regions, the analysis includes only 5 to 6 regions, which considerably restricts the size of the panel dataset and therefore places some limitations on the generalizability of the findings.

5. Discussion

Firstly, the identification of the determining factors of tourism demand at the regional level that has been carried out in this work has revealed some important conclusions. Tourism may be considered either a luxury (superior) good or a necessary good depending on the demand indicator used. This reflects that the effect of economic growth on tourism demand is not uniform across different measures. Nevertheless, in all cases, tourism is confirmed to be a normal good, as increases in regional GDP lead to higher tourism demand. Higher regional GDP is often associated with improved infrastructure, greater public and private investment in tourism services, stronger international promotion, and enhanced accessibility and safety—all of which help attract tourists. This may explain the elasticity greater than one for the first two metrics. The much lower elasticity for tourism density indicates that, while tourist numbers increase with GDP, the geographic size of the region imposes physical constraints on spatial growth. In other words, “territorial saturation” or natural limits to expansion may arise, related to the destination’s carrying capacity, spatially restrictive or sustainable tourism policies, or specific geographic characteristics.

Also, regional destination characteristics also influence tourist decisions. The results show that an increase in coastal kilometers—associated with sun-and-beach tourism—and in the number of designated

cultural heritage sites—linked to cultural tourism—positively affects tourism demand across all indicators. However, there is no evidence that natural area coverage (e.g., kilometers of protected natural land) significantly contributes to increased tourism demand. This may be due to the fact that regions with the largest natural areas tend to receive fewer tourists and may also be subject to conservation restrictions that limit tourism exploitation.

On the other hand, the level of uncertainty related to the pandemic plays a significant and negative role on tourism demand, this result underscores the structural vulnerability of the tourism sector to exogenous health-related shocks, such as the COVID-19 pandemic. It highlights the need to design resilience strategies for tourism, including safety protocols, effective communication strategies, and contingency mechanisms for future crises.

Secondly, with regard to the disaggregated analysis at the regional level, between tourist and non-tourist regions, income elasticity is much higher in non-tourist regions, thus representing a superior good or a luxury good in those regions that do not show high tourist demand.

From an economic perspective, this suggests that in non-touristic regions, international tourism still has considerable room for growth—likely because tourism supply is less consolidated. GDP growth in these areas may help finance improvements in infrastructure, promotion, services, and connectivity, which are key to attracting foreign visitors. Moreover, these regions may still be in the early stages of the destination life cycle, making them more responsive to economic improvements in terms of increased tourism demand.

In contrast, in traditionally touristic regions, international tourism may be more stabilized or even approaching its carrying capacity. As a result, income growth does not translate into proportionally large increases in demand. In other words, the lower income elasticity in these regions may reflect saturation effects or destination maturity.

6. Conclusion

In recent decades, tourism has positioned itself as one of the most dynamic and fastest-growing sectors worldwide. Despite the significant impact of COVID-19 beginning in 2020, the sector demonstrated a rapid recovery, and by 2024, global tourism had reached pre-pandemic levels. The arrival of tourist flows to a specific geographic area generates substantial economic impacts on local economies, and the expansion of tourism activity acts as a key driver of economic growth in tourist destinations. Therefore, tourism demand plays a central role in destination management and in the design of tourism planning policies. Understanding the factors and causes behind tourists' destination choices is essential for formulating effective and targeted policy responses.

The identification of tourism demand determinants has attracted substantial attention in the literature, which shows considerable heterogeneity in terms of selected variables, data, methodologies, and analyzed destinations. Within this body of work, regional-level analyses have been relatively scarce. This is a critical gap, especially considering that tourism development tends to be highly uneven across subnational territories, calling for regionally adapted public policies.

Given the uneven development of tourism demand across regions in Spain, this study adopts a regional approach to examine the determinants of international tourism demand. The analysis uses data from Spain's 17 NUTS-2 regions over the period 2001–2022 and specifies three distinct models, each capturing a different measure of tourism demand: total activity (international arrivals), tourism intensity (arrivals per capita), and tourism density (arrivals per square kilometre). All estimations are carried out using a dynamic panel model with System-GMM.

The results suggest that tourism follows a dynamic path that is influenced by its own past values, although the degree of inertia is low. In all models, tourism in the previous year contributes positively to

current levels, though moderately. This limited inertia prompts further investigation into other determinants of tourism demand in Spain.

Among these, price levels and income in the main source markets play a key role. In standard demand functions, prices are inversely related to the quantity demanded, and this relationship is confirmed across all models—tourism is found to be a relatively inelastic service. Additionally, in all cases, tourism is shown to be a normal good: increases in regional GDP are associated with higher local tourism demand. Higher regional income is typically linked to better infrastructure, greater public and private investment in tourism services, international promotion, improved accessibility, and greater safety, all of which attract more tourists. The positive impact of income is more than proportional when measured in absolute terms or relative to population (intensity), indicating that tourism behaves as a superior good. However, its effect on tourism density is more moderate, potentially reflecting physical limitations on territorial expansion or more restrictive policies in already saturated regions.

Tourism supply indicators also show a positive and significant effect across all three demand measures. The evidence further indicates that regional destination characteristics significantly influence tourists' vacation choices. Tourists seek destinations for cultural tourism, sun-and-beach tourism, and nature-based experiences. The analysis confirms that regions with more kilometers of coastline and a higher number of designated cultural heritage assets tend to receive more tourists. However, natural area coverage appears to have a neutral or even negative impact on international tourism demand. This may be due to the fact that regions with extensive natural areas receive fewer tourists and often prioritize conservation, which may disincentivize mass tourism.

Pandemic-related uncertainty, measured through a global uncertainty index, plays a significant and negative role, reducing tourism demand. This highlights the structural vulnerability of the tourism sector to health-related exogenous shocks, such as COVID-19, and underscores the need to design resilient tourism strategies that include safety protocols, effective communication, and contingency mechanisms for future crises.

A robustness check was conducted by analysing touristic and non-touristic regions separately. While some differences emerge, the dynamic effects of tourism are consistent across the three demand indicators. Income elasticity is notably higher in non-touristic regions, suggesting that international tourism still has considerable growth potential in these areas. This may be because their tourism supply is less developed, and economic growth allows for investments in infrastructure, services, and promotion, which are critical for attracting foreign tourists. These regions may also be in the early stages of the destination lifecycle, making them more responsive to income growth.

In contrast, in established touristic regions, international tourism may have reached a stage of maturity or saturation, which limits the impact of income increases on demand. This regional heterogeneity implies that many policy recommendations derived from national-level analyses may not be fully applicable. It reinforces the need for tourism strategies to be designed at the regional level.

Finally, this study faces certain limitations. One major limitation is the temporal scope, constrained by data availability. From a methodological standpoint, the model employs a linear specification, which may fail to capture nonlinearities and varying elasticities. Future research could benefit from nonlinear or non-parametric approaches. Moreover, the current analysis only considers hotel capacity as a proxy for tourism supply, omitting alternative forms of accommodation such as Airbnb. Future studies could incorporate additional variables, including sustainability indicators, environmental quality, or perceptions of safety. If data availability permits, further research should also explore differentiated effects by tourist type or country of origin.

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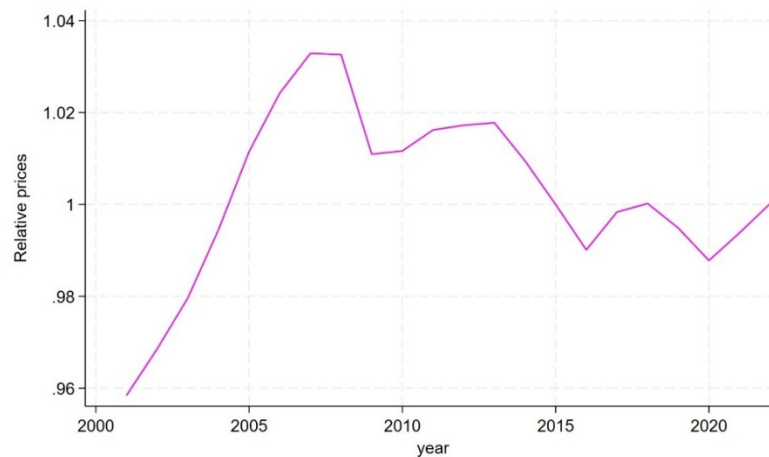
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Appendix

Figure A shows Spain's relative prices compared to its 14 main tourism partner countries, in average terms.

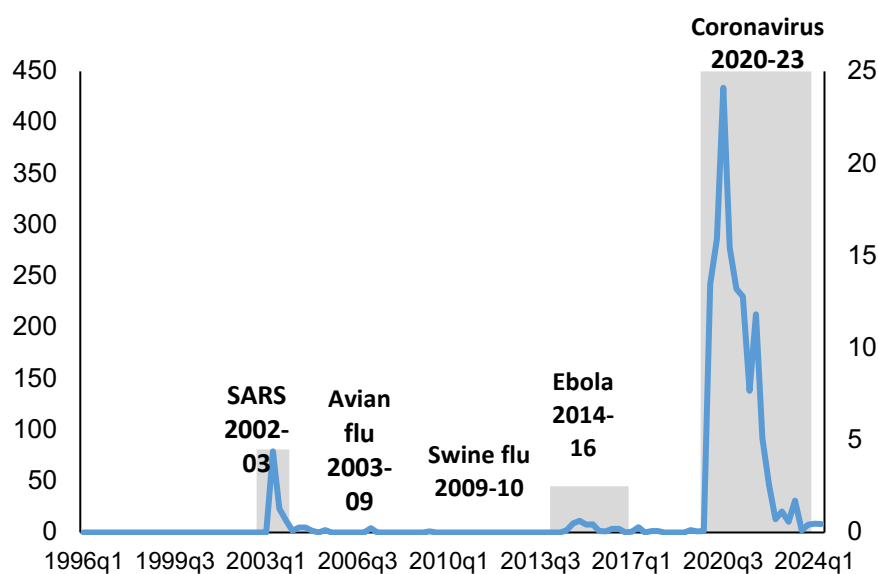
Figure A. **Relative Prices in Spain**



Source: own elaboration.

The index is measured at the global level (as used in this study) and by country, without disaggregation at the regional level; therefore, its variability is exclusively temporal (Figure B).

Figure B. **World Pandemic Uncertainty Index**



Source: <https://worlduncertaintyindex.com/>