



Research article

Crises and tourism demand in Spain

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ABSTRACT

Over the last 20 years, the Spanish tourism sector has been affected by three very different types of crises: the global financial crisis of 2007/08, the socio-political crisis engendered in the Arab Spring, and the COVID-19 global pandemic. This study analyses how these crises jointly affect the demand for tourism in Spain. To better assess the current situation, the analysis breaks down the total demand into international and domestic segments, which are further broken down and analysed according to the type of tourist establishment. This study was carried out using dynamic panel data models, which were estimated using a Generalized Method of Moments (GMM). The results indicate that the financial crisis did not have negative impacts on global tourism demand in Spain. The Arab Spring had a significant positive effect, while the COVID-19 pandemic had a very negative impact on the demand for Spanish tourism, which was even more pronounced in the case of international tourism demand. The relative impacts vary considerably when different kinds of establishments are considered and when the evolution of domestic tourism is analysed compared to international tourism. We discuss the policy implications in light of these results.

1. Introduction

Spain is one of the main destinations for international tourism and tourism is one of the most important activities in the Spanish economy. In Spain, tourism accounted for 11.6 % of GDP and 9.3 % of total employment in 2022 [1]. With over 85 million international tourists in 2023, Spain ranked second worldwide, behind France and ahead of the United States. Spain also ranked second, behind the United States, in international tourism receipts in 2023 [2].

There have been numerous attempts throughout history and within many fields of knowledge to explain the idea of “crisis”. As yet, however, there is still no universally accepted definition [3,4]. This is likely due to the subjective nature of such a broad term, the umbrella of which covers a vast range of events caused by an even greater array of factors. The UN Tourism Organisation [5] divides crises into five primary types: economic events (e.g., financial crises), socio-political events (e.g., the Arab Spring), health-related events (e.g., the COVID-19 pandemic), environmental events (geological events such as earthquakes) and technological events (e.g., transport accidents). In addition, crises can have their origins in different geographical areas.

Irrespective of the area or region, certain kinds of crises can have far-reaching effects simply because of the nature of a globalized economy and the interconnectedness of supply chains and communications. Countries themselves are increasingly interconnected and interdependent, which means that any type of crisis in one part of the world can have a significant impact on others. This

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interdependence may foment the propagation of the crises and augment the diffusion of their consequent effects. Health problems, economic recession, political instability, the outbreak of war, disasters, or terrorist attacks in one part of the world can dramatically reduce the volume of tourist travel to others [6].

In light of the above, i.e., how unforeseen impacts affect tourism, we can state that crises might be generally defined as: those significant and disruptive events or occurrences of an economic, social, political, environmental or health-related nature that negatively affect the tourism sector. They are crises, which in the terminology of Aliperti et al. [7], can be considered “external crises”, in the sense that they are crises that are not directly generated within the industry but have direct impacts upon it.

In this paper, we jointly analyse the possible impacts of three types of crises on the Spanish tourism industry, all of which have occurred during the last 20 years. They are all quite different in terms of their nature, causes and effects.

These three crises are different, both in terms of their nature, their scale, and their impacts. The objective of this research is to analyse how the three different kinds of crises affect the demand for Spanish tourism. We distinguish between domestic and foreign tourism and break down these effects according to the type of establishment (hotels, apartments, campsites, and rural tourism accommodation). Specifically, the analysis aims to address the following questions: (i) Do the different types of crises affect domestic and foreign tourism segments in the same way and, if not, to what extent do they differ? (ii) Do the different types of crises affect the kind of tourist establishment (rural tourism establishments, hotels, apartments, or campsites) differently and do certain kinds of establishments respond better to different crises? (iii) If the impacts are different, shouldn't policy be tailored to mitigate the effects of future crises on different sectors within the tourism industry as a whole?

The paper contributes to the existing literature in several ways. On the one hand, it offers a joint analysis of the effects of three types of crises, with very different characteristics, on tourism demand in Spain. Furthermore, these effects are studied by differentiating between international and domestic demand and between different types of establishments. We have not found studies in the literature that analyse the effects of crises with such a high level of detail for the case of Spain. More specifically, this study makes a four-fold contribution to the existing literature on the subject: a) it is the first work that jointly studies the effects of three types of crises on the demand for tourism in Spain; b) it is the first study that analyses said impacts, differentiating between the segments of domestic and foreign demand; c) it is the first study that looks at how different kinds of establishments are affected; d) the identification of potential differential impacts resulting from different types of crises will allow suggesting specific planning and management strategies for each type of tourist establishment.

The analysis is set out as follows: Section 2 presents a literature review; Section 3 models the effects of the crises; Section 4 presents and interprets the results; and the analysis ends with conclusions and possible policy recommendations.

2. Literature review

External shocks affect the volatility of tourism, tourism demand, and a country's general economic situation [6,8]. Indeed, tourism activity is especially sensitive to external shocks [6,9,10]. Crises can vary in nature, scale and intensity and bring about change, both to the volume of tourism demand and the direction of tourism flows, critically modifying the behaviour of demand in multiple tourist destinations [11–17].

In the relevant literature, various major studies have analysed the effects of crises on tourism and the attempts to manage and mitigate their impacts. Generally speaking, they address the effects of a certain type of crisis: political instability, social conflict, or terrorism [15,18–26]; health crises or infectious diseases [13,27–32]; financial and economic crises [33–39]; and even the impact of other external events such as wildfire damage [40]. The three crises that we are going to analyse in this paper are very different due to their nature, causes and effects. Chronologically, the first of these was the global financial crisis that began in 2007 in the United States. This was triggered by the unscrupulous sale of subprime mortgages by certain financial entities. The crisis spread to Europe in 2008 and severely damaged European economies and, by extension, their respective tourist sectors [41]. According to UN Tourism and ILO [42], global economic crisis of 2007/08 had a significant impact on world tourism, with a fall in income from tourism of 6 % and in international tourist of 4 %.

The global financial crisis had a major impact on Spanish tourism. Using data from the National Statistics Institute of Spain [43], there was an average annual fall in GDP of around 2.6 % for the 2007–2013 period. Activity within the Spanish tourism sector fell by more than 7 % from 2008 to 2009. This decline was gauged by measuring the rate of change in the number of overnight stays in different types of holiday accommodation, including hotels, apartments, campsites, and rural tourism establishments. From 2009 onwards, performance remained unstable until 2014, when tourist activity began a healthier recovery [44]. According to Perles-Ribes et al., [38], the global financial crisis negatively affected the performance of tourist destinations depending on the type of accommodation in the different territories. The authors compared unemployment evolution in residential and hotel specialised destinations and concluded that during the crisis residential destinations experienced a greater destruction of employment than hotel ones.

The phenomenon known as the Arab Spring can be considered a socio-political crisis and with ramifications of a more regional nature in comparison with the financial crisis of 2007/08. This crisis, which began in Tunisia in 2010, originated in a series of popular demonstrations in favour of democracy and social rights in the Arab world. These protests spread rapidly until every Arab country felt its effects [45]. The protests had highly significant, negative effects on the economic activity of these countries, and the tourism sector [11]. These authors affirm that, in the years following these protests, Middle Eastern countries such as Tunisia, Egypt, and Syria experienced a significant drop in the arrival of international tourists. Conversely, in competing countries in the Mediterranean area such as Italy, Portugal and Spain, there was an increase in the arrival of international tourists seeking safer destinations. Other studies, such as those by Mansour et al. [46], found that the Arab Spring that swept through the Middle East and North Africa from 2010 to 2011 gave rise to great political turbulence and was followed by a marked decline in the number of international tourists.

From a Spanish perspective, what happened in Egypt and Tunisia was particularly salient. These were two of Spain's main competitors, both of which were severely affected by the Arab Spring, which in turn changed the dynamics of international tourism within the region. Data from UN Tourism [47] clearly shows that Egypt and Tunisia compete with Spain in attracting tourists from the same countries. Data from both Egypt and Tunisia reveal that international tourist fell at an average annual rate of close to 11 % during the 2010–2016 period for these two countries. In contrast, foreign tourist to Spain increased at an average rate of over 6 % during the same period.

The COVID-19 pandemic, which began in Wuhan, China in early 2020 is the third of these crises, the effects of which are analysed in this study. The disease rapidly spread throughout the world and the number of infections and deaths quickly accelerated. As a consequence, governments felt the need to impose severe restrictions on mobility, both within their respective countries and across national borders to contain the pandemic [13]. All of these factors wreaked havoc on the world economy and the tourism industry in particular. The worst time for the tourism industry was probably the 2020–2021 period, during which the risk of transmission was considered to be highest [14,48].

The pandemic had a severe impact on Spain. Data from INE [43] show that there was an average drop in GDP of around 7 % for the 2020–2021 period (pandemic period) when compared to 2019 (pre-pandemic year). Specifically, the impact on tourism was devastating. The number of overnight stays in hotels, apartments, campsites, and rural tourism establishments fell dramatically, a clear reflection of the sensitivity of this sector to this type of crisis. The average number of overnight stays for the period 2020–2021 fell by 58 % compared to 2019 [44].

3. Modelling the effects of crises

To model the possible effects of the three types of crises described above on the Spanish tourism industry we will use tourist demand as an indicator (indicator that captures the impacts). The scientific literature reveals that the tourist demand allows us to collect the impacts of the different types of crises. For example [6,9,10,49], find that certain specific characteristics of the tourism sector make it particularly sensitive to external shocks. Li et al. [50]; Ritchie et al. [16]; Song & Lin [17]; Afonso-Rodríguez & Santana-Gallego [11]; Perles-Ribes, Ramón-Rodríguez, Moreno-Izquierdo et al., [15]; Karabulut et al. [13]; Mertzanis & Papastathopoulos [14] highlight the fact that the specifics of the crises themselves, can generate changes in the direction and intensity of tourist flows, changing patterns of demand in different tourist destinations. Consequently, it may be affirmed that the indicator for the demand in tourism directly reflects the possible impacts of different types of crises. Additionally, Wong & Song [51]; Rodríguez et al. [52] emphasize the importance of demand analysis as a means of creating better policy within the sector.

Bearing in mind that the different types of crises can temporarily condition tourist demand, and that the response to them can change the strategies of the agents acting within or for different tourist destinations, the effects of the crises thus become possible determinants of such demand. In light of the above, and from an empirical perspective, it seems appropriate to add to the usual number of explanatory variables often used in this kind of analysis. In the field of travel and tourism, demand is usually determined by price and income in these kinds of models [53]. In this study, the effects of the three crises are incorporated as additional regressors.

According to Rodríguez et al. [52], after establishing the validity of including the effects of the crises as possible determinants of the specifications of the demand models, at least three additional factors must be considered; whether to adopt a univariate or a multivariate modelling strategy, whether to use a static or a dynamic model and the choice of the most suitable type of data (cross-section, time series or panel-based).

Our analysis uses a multivariate model simply because it allows us to differentiate between the three different types of crises and how they affect the demand for the different types of tourist establishments. By extension, it shines a light on the viability of using these models in the evaluation of alternative policies. In addition, multivariate models allow us to take into account possible changes in visitor preferences, an inherent versatility reflected in their preponderance in this type of analysis [52].

Regarding the choice between either static or dynamic specification models, research tends to highlight certain problems with the former [54]. Foremost among these is their inability to reflect possible changes in visitor preferences. Consequently, most of the relevant empirical analyses opt for the dynamic specification, particularly since the demand for tourism is dynamic by nature, sensitive to variations in preference, word-of-mouth or idiosyncratic, sociological or cultural behaviours [55–58]. One way of modelling these preferences in order to make them more dynamic is by considering change as an endogenous component, via the inclusion of historical demand (i.e. the lagged dependent variable) in the model. There is a precedent for this option, which is favoured by the following authors: Martínez & Rodríguez [59]; Garín-Muñoz [56]; Rodríguez et al. [52]; Falk et al. [53].

Finally, we chose to use panel data to model the demand for tourism. Panel data have certain advantages when compared to temporal or cross-section data samples [60,61] and their use has been tried and tested (e.g., Rodríguez et al., [52]; or Falk et al., [53]).

Therefore, this paper proposes the estimation of multivariate models, in which the possible effects of the different types of crises are included as additional explanatory variables. We chose a dynamic specification that included a lagged dependent variable to take into account possible changes in the preferences of tourists. Additionally, the data was broken down according to Spanish provinces for the 2005–2023 time period, thus taking full advantage of the panel data.

3.1. Data and variables

In empirical studies, the available statistical information conditions the specification of the models and the estimation procedures of said models [59]. The Spanish National Statistics Institute [44] was used as the main source of data. The database provided the number of overnight stays made by international tourists (international tourism) and those made by Spanish resident tourists

(domestic tourism). The data was further broken down according to the type of accommodation; hotels, apartments, campsites and rural tourism establishments and with respect to their locations i.e. in which of the 50 Spanish provinces they are to be found. The 2005–2023 period takes in the three crises under analysis. Organizing the data according to province (50), establishment (4) and year (19) produces 3800 panel data observations.

If we define tourism demand as the quantity of tourism goods and services that consumers are willing to purchase in a given destination over a specific period [62], the number of overnight stays purchased by tourists can be a good indicator of such demand. Rodríguez et al. [52] argue that the number of overnight stays is a good indicator of tourist demand because it reflects the total duration of the stay. Numerous authors agree with this methodology and use the number of overnight stays as a dependent variable in demand models [53,56,59]. The number of overnight stays recorded by the INE [48] was chosen as the dependent variable.

We consider the following variables as possible determinants of demand.

- a) The most commonly used explanatory variables in tourism demand models (e.g., Rodríguez et al., [52]; Falk et al., [53]):
 - The lagged dependent variable (Stays (-1)). This is included to take into account the possible persistence (preferences, words-of-mouth or habits) in tourism demand. Source: INE [44].
 - The price of tourist services (Prices). The provincial “Consumer Price Index” is used for the “Restaurants and Hotels” group, which is the group in which tourists spend most at their destination. Source: INE [63].
 - Consumer income. The per capita Gross Domestic Product (GDP) of Spain is used as a proxy for the income levels of domestic tourism (domestic tourism) and the per capita GDP of the European Union for international tourism. Sources: INE [43] and European Commission [64].
- b) Dummy variables to estimate the effects of the three types of crises:
 - A binary variable (Financial) is created to distinguish between the demand for tourism during the 2007/08 financial crisis period (time period in which the global financial crisis has had negative effects on the Spanish economy) and the rest of the time. Consequently, this variable takes the value one for the period 2008–2013 and zero for the rest of the years.
 - A binary variable (Spring) splits the period in which the effects of the Arab Spring on the demand for tourism are most salient and the rest of the time. The period between 2011 and 2016 was when Egypt and Tunisia, two of Spain’s closest competitors, were most severely impacted by the Arab Spring in terms of a decline in the arrival of international tourists. The latter period takes a value of 1 and the rest of the time a value of zero.
 - A binary variable (Covid) is created to differentiate between variations in the demand for tourism during the COVID-19 period (years 2020–2021) and the remaining years in the sample. The variable takes a value of one for the years 2020 and 2021 and zero for the remainder.
- c) Dummy variables to measure the differential behaviour of tourist demand according to the type of establishment. We create binary variables to reflect the number of overnight stays in hotels (Hotel), campsites (Camping), apartments (Apartment) or rural tourism establishments (Rural). When there is an overnight stay, the corresponding variable takes a value of 1 and the other variables a zero.
- d) Interactive dummy variables. These variables are constructed as products between the dummy variables described in sections (b) and (c). With this type of variables, we estimate the interaction effects between these two groups of variables [65]. In short, the aim is to analyse whether the different types of crises have a differential effect on tourism demand, depending on the type of tourist establishment.

Some descriptive statistics of the variables used for the estimation are shown in Table 1. Additionally, we present in Table 1 the Chow Breakpoint Test, which confirms that there is no significant structural change when relating the number of overnight stays to prices and GDP.

In order to validate the robustness of our results, we present below (Table 2) the tests for cross-sectional dependence, unit root, and cointegration applied to the 6 variables presented in Table 1.

To test the cross-sectional dependence of the variables, we have used the CD test proposed by Pesaran [66], which is commonly used in this type of empirical work to determine the most appropriate panel unit root test [67]. The results of this test are presented in Table 2. For all the variables, the null hypothesis of cross-sectional independence is rejected.

Since the Pesaran CD tests indicate that the cross-sections of the variables are dependent, applying unit root tests requires the use of second-generation tests. These tests account for cross-sectional dependence. Among them, the most general and flexible is the one proposed by Bai & Ng [68], as it allows testing for unit roots in both common factors and/or idiosyncratic factors [69,70].

Table 1
Descriptive statistics (2005–2023).

Variables (in logarithms)	Acron.	Mean	Max.	Min.	Std.
Total overnight stays (number)	Ln(TStays)	12.612	17.899	6.684	1.946
Domestic overnight stays (number)	Ln(DStays)	12.241	16.273	6.136	1.773
International overnight stays (number)	Ln(IStays)	10.817	17.809	1.386	2.580
Prices (Consumer Price Index)	Ln(Prices)	4.513	4.781	4.220	0.102
Per capita GDP of Spain (Euros)	Ln(GDPS)	10.088	10.320	9.964	0.089
Per capita GDP of EU (Euros)	Ln(GDPEU)	10.258	10.535	10.062	0.125
Chow Breakpoint Test	F-statistic	0.853			

Table 2
Tests for cross-sectional dependence, unit roots and cointegration.

Types of tests	Variables					
	Ln(TStays)	Ln(DStays)	Ln(ISTays)	Ln(Prices)	Ln(GDPS)	Ln(GDPEU)
Pesaran	316.096***	246.509***	377.155***	610.270***	614.898***	614.899***
CD						
Pesaran	-1.479	-1.644	-1.740	-1.858	-1.379	-1.378
CIPS						
ADF_F^C	-2.375	-1.638	-1.188	1.976	0.015	1.175
P_E^C	-3.581***	-3.865***	-2.757***	3.448***	-8.059***	-11.644***
Cointegration tests						
Types of tests	Variables: Ln(TStays), Ln(Prices), Ln(GDPEU)	Variables: Ln(DStays), Ln(Prices), Ln(GDPS)	Variables: Ln(ISTays), Ln(Prices), Ln(GDPEU)	Types of tests	Variables: Ln(TStays), Ln(Prices), Ln(GDPEU)	Variables: Ln(DStays), Ln(Prices), Ln(GDPS)
Pt	-14.026***	-21.258***	-18.113***	-14.026***	-21.258***	-18.113***
Pa	-9.898***	-14.104***	-12.863*	-9.898***	-14.104***	-12.863*

Notes: ***p < 0.01, **p < 0.05, *p < 0.1, indicate significance at 1, 5 and 10 %, respectively.

In this study, we use the Bai and Ng [68] test alongside the Pesaran [71] test, both of which can be implemented using the EViews 13 software. The results of the Pesaran [71] and Bai & Ng [68] tests are also presented in Table 2.

The Pesaran [71] tests (or Pesaran CIPS) fail to reject the unit root null for all variables. For the Bai & Ng [68] approach, we provide the ADF_F^C statistic used to test the null hypothesis of unit root in the common factors, and the P_E^C statistic used to test for the presence of unit root in the idiosyncratic factors. The Bai & Ng [68] tests reject the unit root for the idiosyncratic factors but not for the common factors. These results are consistent with those of the Pesaran [71] test, which indicates that the null hypothesis of unit root cannot be rejected. This occurs for all variables. Since there is evidence that the variables are not stationary (all of them exhibit unit root), it is necessary to analyse whether they are cointegrated. Given the presence of cross-sectional dependence in the variables, the Westerlund [72] test can be used for cointegration analysis. If the cross-sectional units are suspected to be correlated, the Westerlund [72] approach can provide robust critical values using the bootstrap option [73]. The Westerlund [72] approach offers the Pa and Pt test statistics. This test examines the null hypothesis that all cross-sectional units are not cointegrated against the alternative that all are cointegrated. The results of this test are presented in Table 2. In our case, the null hypothesis is rejected, providing evidence of cointegration for the panel as a whole. This rejection occurs across all three sets of variables. The results of these tests are important as they strengthen the robustness of the estimates presented below.

3.2. Econometric specification

In light of the above, the following generic specification is used as a basis for modelling the effects of the three types of crises on the demand for tourism in Spain:

$$\ln(\text{Stays}_{ijt}) = \alpha + \beta_1 \ln(\text{Stays}_{ijt-1}) + \beta_2 \ln(\text{Prices}_t) + \beta_3 \ln(\text{GDP}_t) + \sum_j \delta_j d_j + \sum_c \lambda_c d_c + \sum_j \sum_c \gamma_{jc} (d_j^* d_c) + \varepsilon_{ijt} \tag{1}$$

In Eq. (1), the dependent variable Stays_{ijt} represents the number of overnight stays that take place in establishments of type j , in province i and in year t . The lagged dependent variable Stays_{ijt-1} is included in the model to take into account the dynamic characteristics of the demand for tourism and the possible persistence of said demand. In line with the relevant literature, the variables for prices (Prices_t) and income (GDP_t) are included in the model. Additionally, the three groups of dummy variables described in the previous section are included as explanatory variables: the type of establishment d_j ($j = \text{hotels, apartments, campsites and rural tourism}$); the type of crisis d_c ($c = \text{financial, spring and covid}$); and the interaction between the two types of dummy variables ($d_j^* d_c$). Lastly, ε_{ijt} represents the error term. The model’s quantitative variables are given in logarithms to directly obtain elasticities as a result of the estimation of the parameters $\beta_1, \beta_2, \beta_3$. From the empirical point of view, to better estimate the model (1) the dimensions province (i) and type of establishment (j) have been grouped together, resulting in the economic unit k (province and type of establishment). Thus, instead of simply using provinces, of which there are 50, combining the province and the type of establishment provides us with 200 basic economic units. This allows us to formulate the following model (Eq. (2)):

$$\ln(\text{Stays}_{kt}) = \alpha + \beta_1 \ln(\text{Stays}_{kt-1}) + \beta_2 \ln(\text{Prices}_t) + \beta_3 \ln(\text{GDP}_t) + \sum_j \delta_j d_j + \sum_c \lambda_c d_c + \sum_j \sum_c \gamma_{jc} (d_j^* d_c) + \varepsilon_{kt} \tag{2}$$

$$\varepsilon_{kt} = \eta_k + \varnothing_t + \mu_{kt} \tag{3}$$

Eq. (3) contains the specification of the error term of model (2). It shows the two-way error component disturbance in which η_k denotes the unobservable individual effect. It is a component of each of the economic units and remains constant over time. \varnothing_t denotes the unobservable time effect and remains constant irrespective of the economic unit and, μ_{kt} is the remainder stochastic disturbance term. The correct way to proceed with the estimation and the properties of the resulting estimators will depend largely on the

characteristics of ε_{kt} and the explanatory variables as well as the relationship that exists between this error term and the model's explanatory [52].

Given the statistical information available and the dynamic characteristics of model 2, we decided to carry out the estimation using the Generalized Method of Moments (GMM) procedure, which is suitable for estimating dynamic panel data models and provides consistent and efficient estimators [61]. We adhere to the methodology established by Roodman [74] to obtain the GMM estimators, which involves using the “xtabond2” command, incorporated in the Stata software package. According to Roodman [74] the “xtabond2” command improves upon the proposals of Arellano & Bond [75], Arellano & Bover [76] and Blundell & Bond [77]. This command facilitates estimations in which the instruments are more flexible: it is possible to use these instruments alternatively in differences and levels, only in differences or only in levels.

Studies that have successfully used the GMM procedure to empirically estimate the demand for tourism using dynamic panel data models include those of Garín-Muñoz [56] and Rodríguez et al. [52].

4. Empirical results

Table 3 presents the results of estimating model 2 using the GMM procedure (via the “xtabond2” command), with the code provided below the table. These are a model for the total demand for tourism, another for domestic tourism, and finally, one for the demand for international tourism. The strategy of estimating alternative models may be of interest from the perspective of analysing whether the effects of crises may have differential impacts depending on the type of tourism demand (domestic or international).

The findings suggest that the results of the estimates are robust. The Wald test indicates the joint significance of the explanatory variables, most of which were also significant individually. Indeed, it is not possible to reject the null hypothesis of the specification tests (Arellano-Bond test for second-order autocorrelation and the Hansen test of over-identifying restrictions), which guarantees the consistency of the estimates [61,78].

The results presented in Table 2, show that the conventional variables used in the model (Stays (-1), Prices and GDP) are shown to be significant in explaining the behaviour of the demand for tourism, and they take the expected signs. The high value for the coefficient of the endogenous lagged variable reflects the importance of habits and preferences that create repetitive behavioural patterns among tourists. These patterns are also moulded by the reputation of the different markets and by the way they are promoted, including by word-of-mouth. This effect is more highly persistent in the case of domestic tourism.

On analysing the results for the income (GDP) and price (Prices) variables, one can see that the demand for tourism is more sensitive to the former, and this is true for all three models. There are higher elasticities in the case of international tourism, but the difference between elasticities is more pronounced in the case of domestic tourism, where changes in demand depend much more on income than on price.

Hotels are used as a benchmark when analysing changes in demand across different types of establishments. The three dummy

Table 3
Estimation results for model 2.

Variables	Total Tourism	International Tourism	Domestic Tourism
Ln(Stays (t-1))	0.908*** (84.82)	0.829*** (46.77)	0.933*** (94.15)
Ln(Prices)	-1.951*** (-8.20)	-4.265*** (-7.27)	-1.379*** (-13.60)
Ln(GDP)	2.196*** (10.58)	5.177*** (10.36)	2.255*** (17.37)
Rural	-0.261*** (-6.46)	-0.583*** (-6.21)	-0.158*** (-5.41)
Camping	-0.263*** (-5.64)	-0.423*** (-4.76)	-0.204*** (-5.88)
Apartment	-0.225*** (-5.02)	-0.472*** (-3.97)	-0.155*** (-5.18)
Financial	0.092*** (5.26)	0.329*** (8.29)	-0.006 (-0.73)
Spring	0.012** (2.05)	0.057*** (3.92)	0.170*** (14.04)
Covid	-0.345*** (-16.69)	-0.604*** (-15.77)	-0.060*** (-3.44)
Rural*Financial	-0.020 (-1.31)	-0.073** (-1.97)	-0.030* (-1.89)
Camping*Financial	0.035** (2.39)	0.015 (0.47)	0.045*** (3.02)
Apartment*Financial	0.039* (1.76)	-0.030 (-0.67)	0.060*** (2.59)
Rural*Spring	0.022* (1.83)	0.030 (0.68)	0.017 (1.13)
Camping*Spring	0.011 (0.96)	-0.022 (-1.21)	0.021 (1.34)
Apartment*Spring	0.049*** (2.93)	0.059 (1.44)	0.041** (2.28)
Rural*Covid	0.203*** (7.65)	0.106 (1.62)	0.138*** (5.78)
Camping*Covid	0.225*** (6.76)	-0.044 (-0.70)	0.252*** (11.01)
Apartment*Covid	0.145*** (4.05)	-0.029 (-0.43)	0.161*** (6.85)
Constant	-12.355*** (-11.13)	-31.653*** (-12.40)	-15.620*** (-16.70)
No. observations	3600	3600	3600
No. groups	200	200	200
No. instruments	195	195	195
Wald test (d.f)	4.3×10^6 (18)***	0.3×10^6 (18)***	7.7×10^6 (18)***
Hansen test (Prob)	198.63 (0.78)	199.07 (0.77)	197.79 (0.79)
Arellano-Bond AR(2)(Prob)	-0.13 (0.90)	0.22 (0.83)	0.36 (0.72)

Notes: ***p < 0.01, **p < 0.05, *p < 0.1, indicate significance at 1.5 and 10 %, respectively. Z-statistics are reported in the parentheses. The estimations were carried out using Stata 18 software. Code used in the estimate: “xtabond2 depvar varlist, gmm (lagged dependent variable, lag(1.) collapse) gmm (predetermined variables) iv(exogenous variables) robust twostep”.

variables give significant values, indicating that there are relevant differences in demand depending on the type of establishment chosen. Rural, Camping and Apartment coefficients all take a negative sign, indicating that, for the overall period analysed, the demand for these types of establishments was impacted more severely than that for hotels. This was true for both domestic and international tourism.

The crisis variables, (Financial, Spring and Covid), are also seen to be statistically significant in explaining the behaviour of demand in all three models, except for the Financial variable, which has not been found significant for domestic tourism. However, the effects of the crises were not uniform and reflected the specific characteristics of each. The financial crisis of 2007/08 did not have a negative impact on the demand for tourism. Although Spanish GDP fell during the 2007–2013 period, the demand for tourism remained positive, cushioning the overall decline in the economy during this period. During the global financial crisis, international tourism outperformed its domestic counterpart, at least in terms of demand. On the one hand, the crisis was shorter in some of the other European countries than in Spain, while on the other, for many European residents, a “main” holiday has gone from being a luxury good to a basic necessity. Within this context, Spain is perceived to be an attractive, competitive destination, perhaps more so in times of crisis. In the case of domestic tourism, the financial restrictions resulting from the crisis constricted domestic demand, which fared worse than international tourism. Given the high-income elasticity of demand for tourism, the higher average income levels of foreign tourists can go a long way to explaining the differences between the two segments.

The results show that the Arab Spring had a significant positive effect on the demand for Spanish tourism. This is evident from all three models, but the effect is more intense in the case of the domestic market. This is probably because Spanish tourists tended to avoid the countries affected by conflict and decided to remain in Spain. Similarly, the crisis had a positive effect on international tourism. Foreign tourists probably viewed Spain as a safe, alternative destination and as a good substitute for destinations such as Tunisia and Egypt.

Finally, the COVID-19 pandemic had a very negative, statistically significant effect on the demand for Spanish tourism, particularly in the case of international tourism, almost certainly due to the stringent restrictions on international mobility in place at the time. The overall demand for domestic tourism, however, while constrained by the pandemic, was less harshly affected than the demand for international tourism. Further, the impacts on domestic demand were more varied and tended to depend on the type of establishment, as explained below.

For the variables that reflect the interaction between the types of crisis and types of establishments, hotels were also used as a reference group. These variables prove to be more significant in the case of domestic tourism. They indicate that these types of crises affect different types of establishments in different ways. In contrast, when looking at international tourism, there were no significant differences in the way the different crises affected the different types of establishments. For international tourism, a statistically significant effect (with a negative sign) is observed only in the interaction between the variables Rural tourism establishments and financial crisis. This indicates that these types of accommodations performed worse than hotels in terms of overnight stays during the global financial crisis.

On analysing the domestic tourism segment, we find that the global financial crisis produced significant positive signs in the interaction with campsites and apartments when compared to hotels. This interaction was negative for rural tourism establishments compared to hotels. These results show that during the global financial crisis, the establishments that performed best were campsites and apartments, while those that performed worst were rural tourism establishments. In the case of the Arab Spring, significant results were only obtained in the interaction with apartments. This indicates that this type of establishment benefited from the crisis to a greater extent than hotels.

Significant results were obtained in the case of the interaction between the COVID-19 pandemic and the different types of establishments. During the two years of the pandemic, rural tourism establishments, apartments and campsites all performed much

Table 4
Estimation of the impacts (%)*.

	Total Tourism	International Tourism	Domestic Tourism
<i>Effects depending on the type of establishment</i>			
Rural	-22.97	-44.18	-14.62
Camping	-23.13	-34.49	-18.45
Apartment	-20.15	-37.62	-14.36
<i>Effects according to type of crisis</i>			
Financial	9.64	38.96	-
Spring	1.21	5.87	18.53
Covid	-29.18	-45.34	-5.82
<i>Effects of the crisis on different types of establishment</i>			
Financial on Rural	-	29.18	-
Financial on Camping	13.54	-	-
Financial on Apartments	14.00	-	-
Spring on Rural	3.46	-	-
Spring on Camping	-	-	-
Spring on Apartment	6.29	-	23.49
Covid on Rural	-13.24	-	8.11
Covid on Camping	-11.31	-	21.17
Covid on Apartment	-18.13	-	10.63

Note: (*) Only impacts with all statistically significant coefficients are presented.

better than hotels, in terms of overnight stays.

One of the main objectives of this research is to uncover the differential effects of the various types of crises on the demand for tourism while specifying the variations in this demand depending on the type of establishment. Therefore, it would seem logical to focus on the interpretation of the coefficients of the dummy variables. Indeed, the dummy variables included in the models are intended to capture the behaviour of the different types of crises and establishments. Given that the dependent variable of model 2 is presented in logarithms, the coefficients of these dummy variables do not have a direct interpretation. According to Hill et al. [67], to interpret these coefficients in terms of effects or impacts it is necessary to carry out the transformation $100(\exp(\hat{\theta}) - 1)\%$, where $\hat{\theta}$ is the estimated value of the coefficient corresponding to the crisis dummies, the establishments and of the interaction between the crises and the establishments. Table 4 offers the results of the impacts or estimated effects on the demand for tourism while taking into consideration the interaction between the type of crisis and the type of establishment. These estimates are carried out based on the contents of Table 3.

Some interesting considerations can be drawn from the results offered in Table 4, which we present below. The demand for hotels was greater than for the other types of establishments for the entire period analysed. Hotels outperformed the other types of establishments by about 20 %, and this figure was much greater in the case of international tourism. This result confirms that foreign tourists prefer hotel accommodation.

This analysis verifies that the financial crisis did not have a negative impact on the Spanish tourism market. Quite the reverse in fact, during the period of the financial crisis, demand grew by more than 10 %, growth based on a significant increase in international demand. The results are consistent with those of Cellini and Cuccia [35] who found that, in the case of Italy, the good performance of international demand helped compensate for the adverse domestic shock. We can hypothesize that, in times of global economic-financial crisis, the most competitive tourism markets can absorb excess international demand by offering services that are attractive to tourists who, on average, have greater purchasing power. For domestic tourism demand, the impact was not significant during the same crisis.

The Arab Spring crisis had a positive effect on the demand for Spanish tourism. The results are consistent with those of other works [15,79] and indicate that the regional nature of the crisis helped to boost this demand and, in particular, the demand for domestic tourism. In this case, we can conclude that Spanish tourists turned their backs on destinations that they felt to be unsafe in favour of domestic tourist destinations.

The COVID-19 pandemic, which affected practically the whole world, had a severely negative impact on the demand for Spanish tourism during the 2020-21 period. International tourism fell by an estimated 45 % compared to the entire previous period. Travel restrictions provide the logical, intuitive reason for this fall in demand.

In summary, the global effects of the three types of crises are clearly significant in the three types of models analysed (total tourism, international tourism, and domestic tourism), with the exception of the non-significant impact of the financial crisis on domestic tourism demand. If we analyse the relative impacts of the crises by type of establishment, the results vary considerably. When variations in demand are analysed through the lens of international tourism, however, there would appear to be little or no difference in terms of establishment type. In fact, the only significant result when cross-referencing for international tourism was the positive performance of rural tourism when compared to hotels during the global financial crisis.

In contrast to the demand behaviour for international tourism, there were significant results for variations in demand in domestic tourism. This indicates that, in the case of the latter, there were significant differential impacts. During the Arab Spring, apartment-based accommodation benefited most from the perceived insecurity derived from the political and social upheaval taking place within the borders of some of Spain's main competitors. During the COVID-19 pandemic, rural tourism establishments, campsites, and apartments all outperformed hotels in terms of variations in demand. These results are consistent with those obtained in other studies, e.g Della Corte et al. [80].

5. Conclusions and policy implications

This study confirms the high sensitivity of the tourism sector to external shocks or crises. This confirmation is achieved by jointly analysing the impacts of three types of crises, which are very different in nature, on the behaviour of tourism demand. Additionally, these impacts are studied by differentiating between domestic and foreign demand segments and analysing the response of various types of tourism establishments to the effects of the three types of crises. The level of detail in this study makes it a novel contribution, from which interesting theoretical and practical implications can be drawn.

The study focuses on the demand for tourism because this indicator directly reflects the possible effects of external shocks or crises. In addition, tourism demand studies can be an important tool for proposing possible sectoral policies. Given that the demand for tourism is dynamic by nature, dynamic panel data models were used for the modelling.

The results of the estimations of these models reveal high significance levels for the variables that represent the persistence, price levels and income levels. High levels of persistence in the demand for tourism in Spain may be interpreted as a clear manifestation of the high reputation of the Spanish tourism market and its intensely competitive nature. It is also worth noting that this market is much more sensitive to income levels than to price. This persistence and the difference in elasticities between income and prices is more intense in the case of domestic tourism.

On considering the entire period of the analysis (2005–2023), it can be seen that the demand for hotels has performed better than other types of tourist establishments, both in the case of domestic and international tourism. However, when analysing according to sub-periods, while taking into account the effects of the three types of crises, the results are very heterogeneous reflecting the

characteristics of the three crises.

The financial crisis of 2007/08 did not have a negative impact on the demand for tourism during the sub-period considered. Quite the reverse, demand remained buoyant, particularly in the case of international tourism (in the case of domestic tourism, no statistically significant effect has been found). This was probably due to the perception of Spain as an attractive, economical destination against a backdrop of global financial instability. On analysing how the different types of establishments performed during the financial crisis, it has been estimated that, in the case of domestic tourism, campsites and apartments performed best, and rural tourism establishments the worst. Campsites and apartments are generally the cheapest establishments and almost certainly acted as a refuge for those still wanting to go on holiday despite household budgetary constraints. Rural tourism establishments are, in the main, patronized by domestic holiday-makers, looking for a weekend break or short “second” holiday, arrangements that tend to be cancelled in the face of economic difficulties such as those associated with an economic slump. In the case of international tourism, there were no significant differences in behaviour with respect to establishment-specific demand.

The results illustrate that the Arab Spring had a significant positive effect on the demand for Spanish tourism. The effect is detectable for both international and domestic tourism but is more intense in the case of the latter. This was probably due to domestic tourists staying in Spain rather than risking potential problems in countries in the throes of political and social turmoil. The results reveal that apartments were the establishments that most benefited from this crisis.

Lastly, the COVID-19 pandemic had a very negative, statistically significant effect on the demand for Spanish tourism. This was particularly harsh in the case of international tourism because of the severe restrictions on international mobility. Rural tourism establishments, campsites and apartments performed best during the pandemic in the case of domestic tourism. For international tourism, no significant impacts were found based on the types of establishments.

The methodology used and the results obtained also have theoretical implications. On the one hand, these results, at such a disaggregated level, are only possible through the use of generic and flexible models, such as panel data models, which allow for the combination of the temporal and cross-sectional dimensions of statistical information. On the other hand, the dynamic specifications of the models make it possible to account for the effects of past behaviours on present behaviours.

The above results should prove useful in creating policies designed to protect the tourism sector against the impacts of future crises. The last global financial crisis, for example, illustrated that the extent of its impact depended on the competitive capacity of the markets. Therefore, policymakers should improve infrastructure, environmental conditions, and management with the aim of improving the competitiveness of destinations during non-crisis periods to better withstand periods of instability and perhaps even to take advantage of the realignment of international tourism markets. In order to configure competitive tourist destinations, it is very important to take into account that tourist demand is very sensitive to the price level, but even more so to the income level of potential tourists.

In the case of regional crises, like the Arab Spring, there is a process of substitution via which some tourist destinations are changed for others that are perceived to be less problematic. From this perspective, it is important to be competitive in the international market segment, but it is also very important to prepare the domestic (internal) market so that potential tourists from markets affected by this type of crisis have the necessary incentives to stay in the domestic market.

In the case of pandemic crises, such as COVID-19, the results show that certain types of establishments are preferred to others. Therefore, while making sure both international and domestic tourism markets are attractive and competitive, it is also essential to design a strategy that is diversified, sustainable and based on the characteristics of each type of establishment and their capacity to react to the vicissitudes of different kinds of health crisis.

Several limitations of the study can be cited. On the one hand, the research focuses exclusively on Spanish provinces, and therefore its conclusions are limited to this context. On the other hand, due to the lack of more comprehensive statistical information, the study uses dummy variables to differentiate the behaviour associated with different types of crises and various types of tourism establishments. Consequently, for future research, it would be of interest to expand this study to include other types of external shocks, such as significant episodes of climate crises. Additionally, it would be interesting to broaden the scope of the study to other countries, such as those in the European Union, which share a common statistical information system. At the methodological level, future research could explore the possibility of considering potential spatial effects in models with the economic unit province-type of establishment.

CRedit authorship contribution statement

Xosé A. Rodríguez: Validation, Supervision, Software, Resources, Investigation, Formal analysis, Conceptualization. **Fidel Martínez-Roget:** Validation, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Maria L. Loureiro:** Validation, Supervision, Methodology, Investigation, Formal analysis, Conceptualization.

Data availability statement

Data will be made available on request.

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