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Territorial tourism resilience in the COVID-19 summer

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ABSTRACT

This paper quantitatively analyzes the resilience of tourism to COVID-19 and its territorial distribution in Spain, a global tourism power and one of the countries most affected by the pandemic. A first descriptive analysis of data from the summer of 2020 shows that: i) resilience was not homogeneously distributed across Spanish provinces; ii) the territorial concentration of tourism demand decreased due to the pandemic crisis; iii) the distribution of resilience was not consistent with standard indicators of tourism competitiveness. Econometric modeling shows that pre-pandemic domestic market specialization and population density explain most observed variability. Therefore, resilience was largely predetermined, so that the different policies adopted by some territories to attract domestic demand played a minor explanatory role.

1. Introduction

The COVID-19 pandemic has dramatically impacted global tourism. Mobility-limiting restrictions aimed at mitigating the spread of the virus have seriously damaged the leisure and travel industries around the world. According to the UNWTO (2020a), international flows dropped by an estimated 70% during the first eight months of 2020, resulting in a $730 billion loss: a figure eight times larger than the fall in revenue observed during the 2009 global financial crisis.

Tourism is one of the most vulnerable sectors of the economy because it is especially sensitive to external shocks (Ritchie, 2004; Williams & Bálaz, 2015). To date, studies have analyzed the vulnerability of tourism to environmental shocks related to climate change (Moreno & Becken, 2009; Dogru, Marchio, & Bulut, 2019; Scott, Hall, & Gossling, 2019) and natural disasters (Kim & Marcouiller, 2015; Roselló-Nadal, Becken, & Santana-Gallego, 2020). Studies have also investigated the impacts of political instability, conflict, and terrorism (e.g., Enders & Sandler, 1992; Fourie, Rosselló-Nadal, & Santana-Gallego, 2019; Liu & Pratt, 2017; Pizam & Smith, 2000; Saha & Yap, 2013; Santana-Gallego & Fourie, 2020). However, the shocks examined in these studies were primarily local, whereas the current pandemic represents a global shock, although its effects were not distributed homogeneously across regions.

The concept of vulnerability is usually associated with resilience. Although resilience can be defined in several ways (see, e.g., Twigger-Ross et al., 2014), this paper focused prominently on the meaning of resilience in a short-term operational context. Thus, we defined tourism resilience as the ability of a destination to absorb shocks and continue to operate (i.e., its degree of resistance to reductions in activity and tourism flow), as in Clark et al. (1998). This notion of resilience is based on the ability to maintain demand, representing a change from historical approaches to tourism analysis, which typically relied on infinite demand growth (Prideaux, Thompson, & Pabel, 2020; Williams, 2009). The COVID-19 pandemic has made such approaches impossible, necessitating a short-term return to defensive strategies. The pandemic is also expected to influence the formulation of long-term tourism strategies, as such strategies must consider the need for adaptation to a continuously changing environment.

In this context, the value of some strategic factors, such as market proximity, has changed substantially. Domestic markets have emerged as safe sources of tourism activity ahead of international markets, which may have a more significant economic impact but come with greater risk. Thus, the mobility restrictions imposed by the pandemic have increased the strategic value of the domestic tourism market, which is less affected by such restrictions. Domestic tourism has proven to be more resistant than international tourism to the COVID-19 pandemic and has been identified by several studies as a critical element of the post-COVID economic recovery (Arbulú, Razumova, Rey-Maquieira, & Sastre, 2021; Gossling, Scott, & Hall, 2021; Hall, Scott, & Gössling, 2020; Kreiner & Ram, 2021; Moreno-Luna, Robina-Ramírez, Sánchez-Oro Sánchez, & Castro-Serrano, 2021; Navarro, Ortega, & Torres, 2020; OECD, 2020; OECD, 2020b; UNWTO, 2020b, 2020c; Woyo, 2021).

Although the COVID-19 pandemic has had an overall negative

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impact on tourism, its effects have not been distributed homogeneously across territories (WTTC, 2020). Destinations within countries have competed to attract domestic tourism, as international mobility was drastically reduced in 2020. In Spain, for example, many destinations focused their summer 2020 campaigns on the domestic market, as widely reported by the press. However, the pandemic impacted different Spanish destinations in different ways, leading to a shift in historical dynamics (Donaire, Galí, & Camprubi, 2021; Moreno-Luna et al., 2021).

This study analyzes tourism resilience across Spanish territories. Spain is highly dependent on its tourism sector, with tourism accounting for 14.3% of Spain's GDP, compared to the EU average of 9.5% (WTTC, 2020). The pandemic also affected Spain; its tourism GDP was expected to fall by around 70% in 2020 (Exceltur, 2020). Therefore, we took the Spanish provinces as territorial units of analysis and adopted hotel demand as an indicator of resilience due to its higher impact and the availability of detailed territorial data.

The objectives of this study are twofold. First, it assesses the 2020 summer hotel overnight resilience at the provincial level. Secondly, it investigates the factors contributing to the observed differences across provinces, including external dependency, population density, the tourism products on offer, and the pandemic's incidence in each province. The results suggest that most differences across territories are explained by these factors rather than by short-term adaptations in response to the pandemic. Resilience is explained mainly by each region's population density and pre-pandemic focus on domestic tourism, which indicates a persistent dynamic component in domestic demand. Interestingly, the incidence of COVID-19 does not play a significant role in explaining resilience.

Most of the literature investigating the impact of COVID-19 on tourism has been done at a global scale, analyzing major world regions, or has evaluated its effects at a national aggregated level. For example, Gil-Alana and Poza (2020) study the impact of the COVID-19 on Spanish tourism using a strong-dependence model. While there are also studies using data at lower levels of aggregation, these focus on specific regions or cities (e.g., Arabadzhyan, Figini, & Zirulia, 2021; McCartney, 2021; Provenzano & Volo, 2021). This paper contributes to this literature by analyzing the impact of COVID-19 on the different destinations within a country. Further, it assesses the factors that might explain the observed heterogeneity across territories, quantifying their contribution to resilience.

Following this introduction, the rest of the paper is organized as follows. Section 2 describes the conceptual framework and poses the research questions, while section 3 discusses the methodology and data collection. Section 4 presents the results, and, finally, Section 5 identifies the implications of the results and makes some concluding remarks.

2. Conceptual framework and research questions

The existing literature on tourism shocks has noted the roles of resilience and vulnerability in these contexts (e.g., Calgaro, Lloyd, & Dominey-Howes, 2014; Liu & Pratt, 2017; Scott, Munrey, & Sin, 2012; Tsao & Ni, 2016). However, the definitions of these terms, and the relationship between them, have not been agreed upon in the literature.[1]

Vulnerability is difficult to define due to the multidimensional nature of threats.[2] For example, the United Nations (UN) has defined resilience as "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to transform and recover from the effects of a hazard in a timely and efficient manner" (UNISDR, 2009). Thus, resilience concerns the responses to the impacts of a hazardous event, including both resistance and adaptation. On the other hand, vulnerability is defined as "the conditions determined by physical, social, economic, and environmental factors or processes which increase the susceptibility of a system to the impacts of hazards" (UNDRR, 2021). This definition encompasses two components of risk: resilience (i.e., response) and exposure to a threat.

Thus, vulnerability concerns the properties of a system that lead to negative consequences in response to a hazardous event (Cannon, 1994). Turner et al. (2003) gave a similar definition, integrating the concepts of exposure, response, and impact, consistently with Risk-Hazard models (Kates, 1985). Clark et al. (1998) followed this approach. They defined vulnerability as a function of two main components: the degree of exposure to the threat (i.e., the risk of experiencing a dangerous event) and the ability to respond to it. The latter component includes resistance (i.e., the ability to absorb shocks and continue functioning) and resilience (i.e., the ability to recover from loss after a shock). Pelling (2003) followed the same framework.

The previous two components relate to response capacity, which represents the combination of system attributes (in this case, the characteristics of a tourism destination) that can reduce the impact of a shock (Noy & Yonson, 2018). These include pre-mediated responses to hazards and spontaneous adjustments (Gaillard, 2010). Thus, the concepts of resistance and resilience in Clark et al. (1998) are consistent with the definition of resilience given by UNDRR (2020), which includes adaptation, resistance, and, therefore, the capacity to respond differently in the short and long term. From this perspective, multiple economic, social, and environmental factors contribute to destinations' resistance and resilience, including objective indicators such as physical and natural features and other aspects such as governance, tourism supply and demand, and social cohesion (Turner et al., 2003; World Bank, 2020.

Fig. 1 synthesizes these concepts. Vulnerability is affected by the degree of exposure, resilience (consisting of short-term resistance and medium- and long-term adaptive capacity), and the final impacts. This diagram is also consistent with the impact chain approach used by Arabadzhyan et al. (2021).

The ongoing spread of COVID-19 is an example of a pandemic considered a global shock (OECD, 2011). Pandemics are health crises with significant negative economic consequences (Wilson, Barnard, & Baker, 2020). Consistent with the UN definition described above (UNDRR, 2021), this study focused on short-term resilience, including a destination's capacity to protect its tourism activity from mobility limitations and changes in health regulations (Novelli, Gussing Burgess, Jones, & Ritchie, 2018). In terms of medium- and long-term responses, resilience could include a destination's capacity to adapt to the new paradigm caused by the pandemic. However, such adaptive responses require years or decades to develop (Martin & Sunley, 2020) and were therefore not considered in this work.

This study investigates the impact of various factors on the short-term resilience of Spanish provinces. It also examines whether the observed differences across territories resulted from short-term reactive adaptations or inherent characteristics. We investigate the following research questions:

[1] Thywissen (2006) listed up to 35 different definitions, whereas Nelson et al. (2009a, b) highlighted the lack of agreement on how to turn the concept of vulnerability into analytical measures.

[2] Although many studies have acknowledged the multidimensional nature of vulnerability, few have approached this term from more than one perspective. One exception is Scheyvens and Momsen (2008), who examined the case of small island tourist states and defined as vulnerability as the economic dependence and environmental fragility of a tourism destination. Bramwell and Lane (2009) also argued that tourism is vulnerable to both economic recessions and climate change.

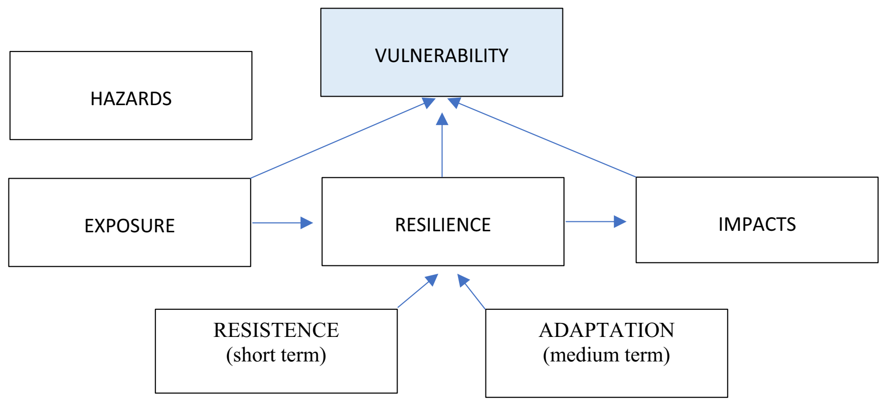

Fig. 1. Tourism vulnerability and tourism resilience concepts.
Source: own elaboration adapted from UNDRR (2020) and Clark et al. (1998)

i) Were there geographical differences in Spanish provinces' levels of resilience during summer 2020?
ii) Were provinces that were already specialized in domestic tourism more resistant to the effects of the pandemic?
iii) Were highly populated provinces (i.e., those with large cities) and less accessible provinces (i.e., those situated on islands) less resilient than other provinces?
iv) Did the type of tourism offered (e.g., nature or sun and sand) have a significant impact on a province's resilience?
v) Did provinces with a high incidence of COVID-19 have lower levels of resilience?

The following section details the steps taken to answer these questions.

3. Methods and data

This paper uses the 50 Spanish provinces (NUTS 3) as the territorial unit for the analysis, with the African autonomous cities of Ceuta and Melilla being excluded because of their unique characteristics. This enables the investigation of the impact of the pandemic at a territorial level. The chosen indicator of short-term resilience is the ratio of hotel demand in July and August 2020 to its corresponding average value between 2015 and 2019. Thus, short-term resilience is defined as the percentage of the average market in 2015–19 that was retained in 2020. Therefore, our focus is on the province's ability to minimize the seasonal damage of the pandemic. Hotel demand is used because it was the most critical component of overall tourism demand in all provinces. It has a considerably more significant economic impact than other components and is available at the province level, while other data, such as camping demand, is not.

Beyond assessing the distribution of resilience across Spanish territories, this paper also examines the factors that led to the observed heterogeneity. First, the relative importance of the domestic market in each province before the pandemic is identified as a crucial factor. Territories specialized in domestic tourism before the Pandemic can be considerably less vulnerable to the shock because of the inertial component of domestic demand, which accounts for the largest share of total demand in 2020 (UNWTO, 2020b). Second, we hypothesize that tourists in 2020 might have placed more value on open spaces and lower density to enable social distancing, making crowded destinations, such as urban tourism, more vulnerable to the COVID-19 shock (Rahman, Gazi, Bhuiyan, & Rahaman, 2021). Additionally, the degree of exposure to the pandemic and their tourism offering (e.g., beach or nature tourism) might have also affected the vulnerability of the different provinces.

Finally, we consider that geographically more remote provinces (e.g., island provinces) were also more vulnerable to the shock because of access limitations and a dependency on air transportation. These factors are not necessarily unrelated. For example, beach tourism is typically linked to social activities. Other studies have also identified such connections (Duro, Perez-Laborda, Turrion-Prats, & Fernandez-Fernandez, 2021; Gong, Hassink, Tan, & Huang, 2020; Gossling, Scott, & Hall, 2021; Ma, Chiu, Tian, Zhang, & Guo, 2020). Fig. 2 summarizes the dimensions impacting vulnerability in this paper's framework.

We employ reasonably consistent indicators for the different dimensions in Fig. 2. First, we group the provinces into the following mutually exclusive categories:

i) non-peninsular provinces (i.e., those located on the Balearic and Canary Islands);
ii) provinces situated in northern Spain, typically associated with nature and known under the Green Spain tourism brand;
iii) other coastal provinces, mainly located on the Mediterranean coast;
iv) the remaining interior provinces not belonging to any of the previous three groups.

As shown in Section 4, this classification emerges naturally from the data using clustering methods. Therefore, it captures most differences in tourism products and access limitations, with all the necessary caveats.

We complement the categorical variables with continuous variables

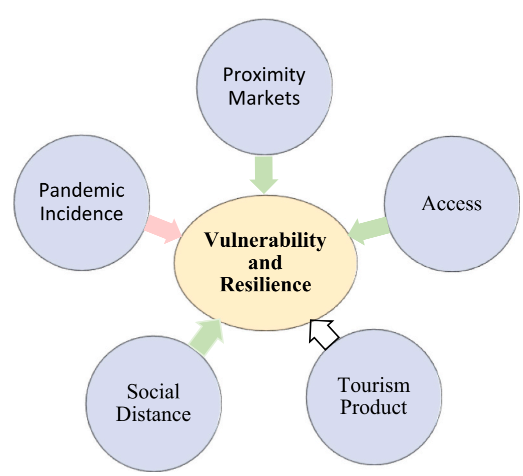

Fig. 2. Tourism resilience and COVID-19 vulnerability: relevant dimensions.
Notes: Green and red arrows indicate positive and negative associations with vulnerability, respectively. The white arrow for the tourism offering indicates that its sign depends on the product offered. Source: own elaboration.

linked to the other dimensions. We evaluate the incidence of the pandemic, the population density, and the domestic market's relative importance before the pandemic. A more precise definition of tourism resilience and the explanatory variables used in the paper is set out below[3]:

- **Resilience (denoted as RES)**: Resilience to the COVID-19 pandemic is defined as the demand attracted by the province in 2020 as a proportion of the average yearly tourism demand between 2015 and 2019. We focus on hotel establishments, as they constitute most of Spain's tourism accommodation. Specifically, resilience is defined as the total number of overnight stays in July and August 2020 compared to the average number of overnight stays in the summers of 2015 to 2019. We use overnight stays as they have a more significant economic impact on destinations than travelers.
- **Weight of the domestic market before the pandemic (denoted as DOM):** We define the pre-pandemic weight of the domestic market as the number of stays by Spanish residents as a proportion of total overnight stays in July and August 2019. This predetermined variable is related to the domestic markets dimension in Fig. 2.[4]
- **Population density (denoted as DENS):** Population density is measured as the number of inhabitants in each province divided by the total area in square kilometers. This variable signals provinces with highly populated cities and is related to the social distancing dimension in Fig. 2.
- **Incidence (denoted as INCID):** Pandemic incidence (cases/population) at the province level is measured based on the average incidence from June 28 to August 30. This variable quantifies the contagion risk; we hypothesize that the higher the incidence in the province, the less willing tourists would be to travel to the destination and the more vulnerable the province is to the COVID-19.
- **Island (denoted as ISL)**: This dummy variable is set to one for provinces situated in the Balearic or Canary Islands (Tenerife and Las Palmas). This indicator is related to the accessibility dimension in Fig. 2.
- **Northern (denoted as NOR)**: This dummy variable is set to one for provinces in regions stretching along the Atlantic coast, between the borders of Portugal and France. It is related to the product specialization dimension in Fig. 2, as provinces in the northernmost part of Spain are known under the tourism brand Green Spain and typically specialize in nature tourism. The northern provinces in this group included A Coruña, Lugo, Ourense, Pontevedra, Asturias, Cantabria, Araba, Bizkaia, and Gipuzkoa, as well as Navarra as it is considered part of the Green Spain brand.
- **Mediterranean (denoted as MED):** This dummy variable is set to one for the remaining coastal provinces situated on the Mediterranean shore. This variable is linked to the product specialization dimension in Fig. 2, as such provinces typically offer beach tourism, which was likely less valued during 2020.[5]
- **Interior (denoted as INT):** This dummy variable is set to one for provinces not in the Island, North, or Mediterranean categories.

The data on resilience, the weight of the domestic market, and population density were taken from Spain's National Statistical Institute (INE). The incidence data were collected using the National Epidemiological Surveillance Network from the Carlos III Institute of Health (ISCIII).

Notably, all variables above except for incidence are predetermined, as their values were fixed before the pandemic. Thus, beyond the importance of each variable in explaining resilience, our research tests whether the provinces had succeeded in implementing policies that shifted the dynamics in place before the pandemic started. Thus, for example, we assess whether destinations traditionally specialized in international tourism could adapt to the new situation and compensate for this dynamic by differentially attracting relatively more domestic tourism in 2020 (i.e., whether they display a short-term adaptative capacity).

A summary of all variables, together with descriptive statistics, may be found in Table 1. The last column of the table reports the correlation of each variable with resilience. As the table shows, correlations always have the expected sign, positive for the domestic market share and the North and Interior dummies. Interestingly, we do not find a significant association of persistence with COVID-19 incidence, indicating that tourists could not have paid much attention to this magnitude deciding upon destination.[6]

The following section (Section 4) investigates the factors behind the observed heterogeneity using a linear econometric model. The estimation of this model allows us to measure the contribution of each explanatory variable *contingent* on the value of the other explanatory factors. This way, we can control potential spurious correlations between resilience and the proposed indicators that may arise in bivariate correlations in Table 1. Specifically, we consider several linear specifications of the type:

$$lnRES = \alpha + \sum \delta_j D_j + \sum \beta_k lnX_k + \varepsilon \quad (1)$$

where $\{D_j\}$and $\{X_k\}$ are (maybe subsets of) the explanatory variables, α is an intercept, $\{\delta_j\}$ and $\{\beta_k\}$ are sets of parameters measuring the influence of the explanatory variables on resilience, and ε is a stochastic zero mean and constant variance disturbance error term.

In addition to econometric modeling, we employed a standard K-mean clustering method (Arthur & Vassilvitskii, 2007; Lloyd, 1982) to detect common patterns in resilience across provinces. The K-mean clustering is a data-driven method that groups similar non-labeled data into a predetermined number of clusters. Data is assigned to clusters so that each observation belongs to the cluster with the nearest mean.[7] The results of the clustering method were employed to justify the geographical dummy classification.

4. Results

4.1. Characterization of resilience across Spanish territories

This section presents a preliminary analysis describing the resilience of tourism demand in the summer of 2020 in the Spanish provinces. The evaluation of the factors behind the heterogeneous distribution is carried out in the next section (Section 4.2).

The first row of Table 2 shows the resilience of hotel demand in the summer of 2020 in Spain. The table highlights the significant decline in activity caused by the COVID-19 crisis. The retention of activity in 2020 is only 31.9% of the average 2015–19 overnight stays. However, the retention of the domestic market is considerably larger (61%), while that of the international market was only 15.6%. As a result, the 2020 summer season can be viewed as a competition among Spanish

[3] More details on the construction of the continuous variables can be found in Duro et al. (2021).

[4] The results in the paper were robust to using the average 2015–2019 domestic market share.

[5] Cadiz and Huelva are in the south of Spain, but on the Atlantic coast. However, they are climatically classified as hot-summer Mediterranean (Csa) Köppen climate types.

[6] During the summer, only two provinces observed an average incidence of more than 250, indicating extreme risk. Most (45 provinces) were placed at values below-average risk. In any case, the values were much lower than those observed in the previous months or those existing in the second wave, wherein November only the Canary Islands is in an AI 14 day below extreme risk values.

[7] As standard procedure, we employ squared Euclidean distance metric and the k-means++ algorithm for cluster center initialization.

Table 1
Summary of all variables: selected descriptive statistics.

Variable	Acron.	Mean	Std	Max	Min	%	Correl.
Resilience	RES	0.51	0.17	0.83	0.14		
Domestic share	DOM	0.68	0.26	0.94	0.08		0.81
Density	DENS	130.6	172.9	833.9	8.6		−0.58
Incidence	INCID	83.45	73.72	367.9	10.42		−0.01
Mediterranean	MED					24%	−0.38
North	NOR					20%	0.27
Interior	INT					50%	0.34
Island	ISL					6%	−0.47

Notes: Two tail 5% critical value for correlation is 0.26. Source: own elaboration based on Spanish National Statistics Institute (INE) database.

Table 2
COVID-19 tourism resilience in Spain: regions and markets.

	Total	Domestic	International
SPAIN	**31,9%**	**61,0%**	**15,6%**
MED	34.7%	59.9%	15.0%
NORTH	63.4%	73.6%	31.0%
INT	42.2%	57.0%	18.6%
ISL	19.5%	56.4%	14.6%

Notes: Resilience is the ratio of hotel demand in July and August 2020 to the 2015–2019 same period average. Hotel demand is measured by overnights stays. Source: *Own elaboration* based on Spain's National Statistics Institute (INE) data.

destinations for domestic tourism.

To obtain an overall view of the territorial distribution of resilience, we cluster the Spanish provinces into four groups according to their relative resilience level: minimal, low, moderate, and high resilience. We employ a standard K-mean clustering methodology (Arthur & Vassilvitskii, 2007; Lloyd, 1982) to avoid a subjective classification of the provinces. Results are depicted in Fig. 3, which maps the provinces and their resilience groups.

The distribution of tourism resilience across Spanish provinces is far from being homogenous. Average resilience in the four clusters is 22%, 40%, 54%, and 70%. Thus, on average, a province in the top resilience group has protected its summer market around three times more than a province in the lowest resilience group. As Fig. 3 shows, provinces clustered in the lower resilience groups are characterized by large capitals or islands. The provinces located along the Mediterranean shore are also classified in low resilience groups. On the contrary, the Interior and Northernmost provinces usually belong to moderate and high resilience groups.

Based on the results above, we segment provinces exogenously in the four geographical regions defined in Section 3 (i.e., Island, North, Mediterranean, and Interior). As Table 2 shows, geographical regions present substantial disparities, despite the overall reduction of the tourism demand. Thus, the northern part of Spain, characterized by lower population densities and a tourism product typically linked to nature, presents higher resilience than the overall territory. As a result, northern provinces have protected around 63.4% of the 2015–2019 average demand. The percentage rises to 73.6% if one only concentrates on the domestic market. At the opposite end, provinces in the Balearic and Canary Islands, highly dependent on international tourism and airplane transportation, have protected a tiny fraction of the previous demand (19.5%). However, if we concentrate on the domestic market, resilience levels are also notably higher, yet still smaller than the percentages reached by other provinces. Finally, provinces situated along the Mediterranean, typically specialized in the sun and sand product, and Interior provinces, which offer a mixture of natural and sociocultural tourism products, place closer to the Spanish average.

Since most of the summer tourism was concentrated in the Mediterranean and the islands, the results in Fig. 3 seem to indicate that the COVID-19 may have led to a lower concentration of activity, distributing the hotel demand more equally across provinces, yet in the context of the overall fall. To study this issue, we compute a Herfindahl Index of concentration in hotel overnight stays to investigate potential changes in the concentration.[8] We found that the index decreased by almost 50% in 2020, falling from 0.098 to 0.05.

4.2. *Factors behind the observed heterogeneity*

This section employs an econometric model to assess the factors behind the heterogeneous distribution of resilience. We run regressions of resilience on the different variables, as in Eq. (1). We consider first a baseline specification that includes all the explanatory variables listed in Table 1.

Some caveats must be made concerning the specification in (1). First, the dependent variable (resilience) and the other continuous explanatory variables are specified in natural logarithms. The objective is to linearize their relationships and obtain residuals (approximately) symmetric and homoscedastic. As a result, the parameters governing the influence of continuous variables have the usual elasticity interpretation, i.e., the percentage change in resilience for a unitary percentage change increase in the variable, keeping all other variables constant. Second, as the model includes an intercept, the joint inclusion of the four geographical dummy variables would result in perfect multicollinearity. To overcome this problem, we leave the Mediterranean dummy out. Consequently, the parameters for the dummy variables can be interpreted as the average percentage difference in resilience to a province of the Mediterranean.

The econometric models are estimated by Ordinary Least Squares given the strong linear dependency of the variables with resilience. Notice, however, that although the considered specifications and the estimation procedure are simple, the relatively short dataset is a potential concern, as they are only 50 provinces in Spain.[9] Selected estimation results are provided in Table 3. The table presents the estimated parameters with heteroskedasticity-consistent standard errors to account for potential heteroskedasticity (MacKinnon & White, 1985). As the table shows, the baseline model can explain a large part of the (log) resilience variance (80%). This percentage is especially relevant as the R-squared in cross-section studies is typically modest, at least when considering the number of explanatory variables (adjusted R-squared).

As for the explanatory variables, all have the expected sign. However, statistical significance can only be established for the northern dummy, density, and, most importantly, the domestic market share in 2019. A 100% larger domestic market share in the 2019 summer implies 45% more resilience in 2020. Population density is also significant

[8] The Herfindahl index is a widely used index of market concentration, especially in industrial economics, and is defined as the squared summation of each province's relative weights.

[9] Nevertheless, we have performed a small Monte-Carlo study around the estimated values to assess the magnitude of this concern and the estimated values and the OLS estimators appears to perform good at $N = 50$ for a tiny model as considered in the paper: there is virtually no small-sample bias, and the small-sample uncertainty is properly covered by the standard errors reported in table 4.

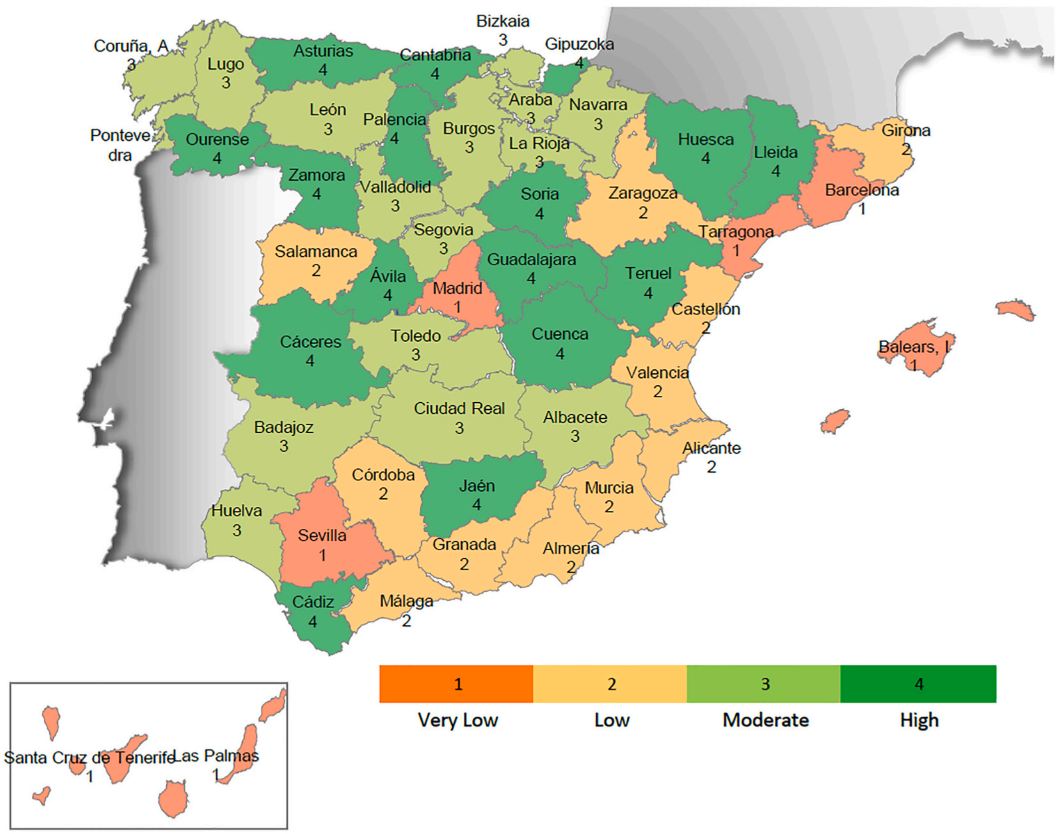

Fig. 3. Resilience across Spanish Provinces: resilience clusters.
Notes: Very-Low, Low, Moderate, and High resilience aggrupation are defined based on a k-means cluster method. Source: *Own elaboration* based on Spain's National Statistics Institute (INE) data.

Table 3
Factors behind observed resilience.

	Baseline		Restricted	
Const.	0.003	(0.250)	−0.050	(0.112)
NOR	0.256	(0.112)**	0.241	(0.099)**
INT	0.023	(0.096)		
ISL	−0.031	(0.228)		
Log DOM	0.453	(0.140)***	0.475	(0.084)***
Log DENS	−0.117	(0.048)**	−0.118	(0.036)***
Log INCID	−0.019	(0.037)		
R^2	0.795		0.793	
$Adj.R^2$	0.767		0.780	
AIC	−14.531		−20.172	
HQ	−9.434		−17.260	
BIC	−0.019		−12.524	

Notes: Heteroskedasticity-consistent (HC1) standard errors in parenthesis. *, **, *** indicate significance at 10, 5 and 1%. Source: Own elaboration. Dependent is log resilience.

(though only at the 5% level). A 100% greater density reduces resilience by about 11%. Finally, we also document that a province in the northernmost part of Spain (Green Spain) has 26% higher resilience than an otherwise identical one located on the Mediterranean coast, all other things being equal.

In addition to the baseline, we consider a restricted specification to exclude the non-significant variables from the model.[10] The exclusion of these variables finds strong support in the data. There is no evidence to reject the null hypothesis that the regression parameters for the interior, island, and capital dummies and pandemic incidence are zero (the *p*-value for the corresponding F-test is 0.952). Therefore, excluding the variables practically does not reduce the explanatory power and improves the information criteria. As Table 3 shows, it is surprising how well such small models fit the data and explain almost 80% of the variability in resilience. The excellent fit of the constrained specifications can also be observed in Fig. 4, which plots the observed against the fitted values. As the figure shows, the model provides reasonable predicted values of resilience for most of the provinces.

The central message from the regression analysis is that the distribution of resilience was written mainly from the beginning. The variables that signal crowded destinations (population density) and, most importantly, the earlier importance of the domestic market explain most of the observed heterogeneity in the distribution of resilience across provinces. These two variables alone explain 75% of the variance. All other characteristics become virtually irrelevant when these variables are considered, even the "insular" attribute that signals the four provinces with the lowest resilience ratios. Therefore, our results give a minor role to policies undertaken to compete for the domestic market.

Exceptionally, the provinces in the northernmost part, the so-called 'Green Spain,' performed better than the others, even after accounting for the value of the other explanatory variables. Interestingly, the four regions that make up the tourism brand 'Green Spain' (Galicia, Asturias, Cantabria, and Euskadi) have unanimously declared to suspend international promotion until the health emergency and focus on positioning

[10] Notice that the coefficient for the North dummy changes in the restricted version and measures average differences with respect all other provinces, not only Mediterranean.

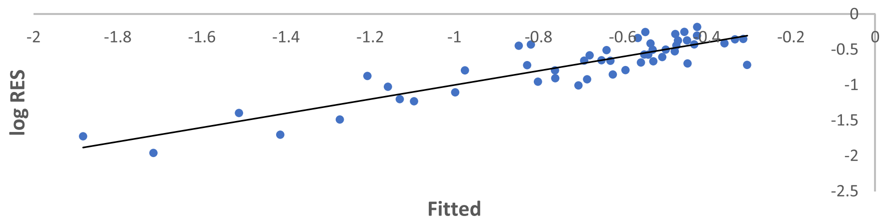

Fig. 4. Observed vs. fitted: restricted specification.
Notes: The line represents perfect model adjustment—source: Own elaboration.

the brand within Spain.[11]

4.3. Robustness analysis

We re-estimated the baseline specification using alternative resilience measures, population density, and COVID -19 incidence. A description of these alternative measures follows. First, we considered a version of resilience in terms of travelers instead of overnight stays. Second, we used a definition of density that adds the average number of tourists per day in July and August 2019 to residents as a proxy for the seasonal summer population.[12] Finally, we measured COVID -19 incidence using the level on June 30. In this way, the variable becomes predetermined in the regression (as are all other variables), thus being more robust to simultaneity concerns.

Estimation results for the three robustness checks are reported in Table 4. Considering resilience in travelers, the most significant difference between Tables 3 and 4 is that the North dummy is no longer significant. Also, the Interior dummy became negative and significant. Differences can be explained by the fact that Mediterranean provinces faced a decline in travelers (have retained 46% of travelers) and a considerable drop in the average stay (25% less). On the contrary, Northern and Interior provinces have maintained a 63 and 40% of travelers, but the average stay has remained constant (or even increased for Interior). However, the key results remain. The most critical variable is the domestic market share in 2019 and density, the latter to a considerably lower extent. As for the other two robustness checks, the results in Table 4 are virtually identical to those reported in Table 3.

Table 4
Robustness results: baseline specification.

	➔ RESB		➔ DENSB		➔ INCIDB	
Const.	−0.201	(0.329)	0.003	(0.251)	−0.025	0.223
NOR	0.044	(0.116)	0.255	(0.112)**	0.270	(0.107)**
INT	−0.260	(0.114)**	0.022	(0.095)	0.035	0.098
ISL	−0.081	(0.214)	−0.030	(0.228)	−0.054	0.221
Log DOM	0.499	(0.170)***	0.452	(0.140)***	0.460	(0.130)***
Log DENS	−0.106	(0.061)*	−0.116	(0.048)**	−0.127	(0.050)**
Log INCID	−0.015	(0.037)	−0.019	(0.037)	−0.017	(0.023)
R^2	0.647		0.795			
$Adj.R^2$	0.598		0.766		0.797	
AIC	0.773		−14.454		−15.049	
HQIC	−6.682		−9.358		−9.952	
BIC	−1.585		−1.070		−1.665	

Notes: RESB, DENSB, and INCIDB, indicate the alternative measures of resilience, density, and incidence, respectively. Heteroskedasticity-consistent (HC1) standard errors in parenthesis. *, **, *** indicate significance at 10, 5 and 1%. Source: Own elaboration.
Dependent is log resilience.

5. Conclusions and implications

Research on the resilience and vulnerability of tourist destinations dominated the specialized literature in 2020 due to the enormous shock caused by the COVID-19 pandemic on the tourism sector, and they continue to be a focus of research. The reduction in international tourism activity experienced since the pandemic has been unprecedented in recent history. The tourism crisis caused by COVID-19 began abruptly and is global in nature, affecting all destinations in one way or another.

This paper examined tourism resilience in Spain, a leading global tourist destination severely affected by the COVID-19 pandemic. Given the heterogeneity of the tourism products offered within Spain, it is interesting to study the observed differences in resilience across destinations. In this study, we investigated the resilience of hotel demand in the summer of 2020 by comparing the 2020 summer overnights to the average summer number in 2015–2019. Beyond the enormous overall decline in tourism activity, we found significant territorial differences in the distribution of resilience. Resilience was higher in northern areas, which typically specialize in nature tourism, and lower in those that usually experience high tourism demand: the Mediterranean coast and the two archipelagos. Thus, the crisis led to the decentralization of hotel demand in Spain, which might be perceived as a positive development if it did not occur in the context of an overall decline in tourist activity.

We estimated an econometric model to identify the main factors influencing the observed heterogeneity in tourism resilience across Spanish provinces. Our findings concerning these factors have implications for designing appropriate tourism policies to increase resilience and reduce vulnerability. Our results suggest that three key factors explained the bulk of the summer 2020 tourism outcomes.

First, we found that previous specialization in the domestic market was responsible for a large share of the variance in resilience. Despite the fierce competition among provinces to capture domestic tourism, the 2020 summer season resilience was partly predetermined. Provinces that already specialized in the domestic market performed better. In contrast, the provinces that had not previously relied on this market did not successfully change this dynamic in the short term. The implication is that destination managers must set strategic objectives related to their dimensioning in the global demand structure, including minimum levels for domestic markets. Focusing on the domestic market ensures self-sufficiency and, therefore, a kind of tourism independence.

Second, the population density was also relevant to explaining territorial differences in tourism resilience. Thus, less dense territories performed relatively better despite the overall reduction in activity. Significantly, this variable, like the focus on domestic tourism, was related to the pre-pandemic context in each province. As an exception,

[11] See, e.g., https://www.eldiario.es/economia/espana-verde-nacional-campanas-sociales_1_5872603.html; https://www.turismo.gal/espazoinstitucional/actualidade/detallenova?langId=es_ES&content=nova_2135.html&ordRs=4.

[12] Estimates of the summer seasonal population are not available at the province level. Therefore, the measure employed must be taken with caution, as it omits important factors that might introduce noise. For example, the measure neglects the percentage of the resident population leaving the province for holidays, which might not distribute equally across territories.

the Green Spain group, which comprises the northernmost provinces of Spain and focuses on nature tourism, performed better than the others, yet only in overnight stays. One potential explanation is that the northern provinces captured part of the domestic market from other destinations (i.e., the Mediterranean coast or island provinces). Tourism in the provinces of the north is typically characterized by a relatively extended stay, which explains these provinces' greater overnight resilience relative to the Mediterranean.

The results suggest that the pandemic caused Spanish residents who typically divide their summer holidays between the north of Spain and the Mediterranean, which is a typical pattern for residents in Northern provinces, to lengthen their stays in northern destinations at the expense of the Mediterranean. This interpretation is consistent with the fact that the dummy signaling northern destinations was significant in computing resilience in terms of overnight stays but not travelers. Future research could investigate whether this trend has continued in 2021. In any case, despite the intensity of provincial strategies for attracting the domestic market, the provinces could not significantly change their previous trajectories.

Third, we found that the incidence of the pandemic did not significantly influence resilience after controlling for other factors. These results indicate that travelers did not consider infection levels in selecting their destinations within Spain in summer 2020.

Finally, it must be highlighted that our results also indicate that 2020 resilience has not conformed to the orthodox notion of tourism competitiveness considered, for example, in the reports of the World Economic Forum (WEF, 2019). Unfortunately, there are no competitiveness indices available at the province level in Spain to investigate this conjecture. However, they are available at the higher aggregated region level (NUTS 2), periodically reported by Exceltur in its Tourism Competitiveness Monitor (Exceltur, 2019)(). We compute the correlation coefficient between the (logs) of hotel summer overnight resilience evaluated at the regional level and the tourism competitiveness index provided by Eceltur, finding a clear negative relationship between the two variables. The correlation coefficient is −0.71, making it clear that the 2020 resilience of the different territories has had little to do with the standard notion of tourism competitiveness. Thus, our results suggest the need to revise competitiveness indicators, considering multidimensional destination risk.

It is difficult to predict whether the trends identified in this paper will continue into the near future. Nevertheless, academics and policymakers must consider the different dimensions of tourism vulnerability (i.e., risk exposure, resistance, and adaptation), just as they do for natural systems. In this sense, the results of this paper indicate the need for a reevaluation of the main strategic objectives of tourism destinations. Decision-makers should consider adopting a sufficient focus on domestic and other short-distance markets, seeking to reduce the density and seasonality, and specializing in products other than sun and sand (e.g., nature tourism). Such consideration will enable appropriate risk reduction and lead to optimal levels of resilience, at least in the short term.

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