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Analysis of the factors determining the distribution of heritage sites in Portugal

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Abstract. While all places have their own historical and cultural wealth, not all areas have the same number of points of tourist interest. Classified objects of heritage are a case in point: some places have a high concentration of classified heritage objects, while others do not. This article discusses the heterogeneity of objects classified as heritage of public interest in Portugal. In addition to a descriptive analysis, we estimated models for explaining this heterogeneity. The dimensions most responsible for such a phenomenon are those related to the centrality of places, their economic dynamism, and their touristic vocation. We found that variables like the centrality of a place, being close to the Spanish border, or having decentralised delegations of certain ministries impact the number of tangible and intangible cultural heritage objects. We further explore these outcomes by considering their serious challenges for less dense areas.

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1. Introduction

In economic decision-making processes, particularly in the design of local and regional development initiatives, we know that geography matters. Each space and each location, with their specificities, require different decisions on the part of economic agents. The same economic agents who make one set of decisions in one location would likely make different decisions in a neighbouring location.

As a consequence, different locations have had different productive uses and heterogeneous tourism dynamics. Different locations develop different agricultural cultures, promote different sectors of economic activity and receive different tourist flows. However, when we consider cultural or monumental heritage issues, we must question why specific spaces and locations have many more heritage objects than others.

We also consider that all places have their history, richness and beauty. However, using the example of heritage in Portugal, we can verify that certain regions have many more heritage objects classified as being of public interest and that, within each region, certain localities have a concentrated number of items classified as cultural or historical heritage.

In one sense, classifying a heritage object as public heritage is a process that results from the promotion of local agents or associative promoters who have identified and taken care of said object. These agents then trigger a set of official procedures, requesting public authorities to classify the heritage object as important for the community. These public authorities can include various public agents (from municipal councils and regional or national governments to, at the most demanding international level, the United Nations Educational, Scientific and Cultural Organisation UNESCO).

Therefore, it is important to understand why certain municipalities have a large number of classified heritage objects while others do not. A major reason highlighted in the literature is the division between the existence of either local promoters (tourist agents, cultural associations, or community curators, for example) or decentralised and responsible public figures.

Thus, currently, we find ourselves in a multifaceted universe regarding heritage. We have tangible heritage (like a palace, a castle, or even a book), intangible heritage (like a popular celebration or festival), and "living" heritage (with trees of public interest, boulevards, protected areas, parks, etc.). Each classified/certified heritage can be of municipal, regional, national, or even world interest, and the major motivation for each heritage valuation can be cultural, historical, industrial, or religious, among other motivations. It is also important to mention that communities have heritage even if they lack certain objects being officially recognised as heritage of public interest (either due to devaluation of the concept by promoters or curators or because official recognition entails costs that outweigh the expected profits).

The relationship between the pattern of economic development and the care of heritage by the community has received increasing attention in academic analysis (Jones & Munday, 2001; Snowball & Courtney, 2010; Oh & Kim, 2016; Amado & Rodrigues, 2016). Central places such as administrative headquarters are also places with built heritage – namely historical buildings – that also cement this symbolic capital, accumulating heritage over the period during which they have been central (Csurgo & Boldizsár, 2016; Rivero, 2017). Spaces with a tourist vocation also have tour operators interested in attracting the incoming flow of tourists, who bring additional revenue to local businesses. The tourist comes for an experience of expected comfort in consideration of the existing tourist offer, namely the offer of cultural heritage (Johnstone & Brice, 2023).

This research will, therefore, analyse an emerging topic that presents three important research gaps. The first research gap concerns the integrated discussion of which socio-economic dimensions explain the very heterogeneous distribution of objects classified as tangible or intangible heritage. This research is necessary for policies in this area in Portugal but also at the European level. The second research gap relates to the need to conduct this discussion in such a way as to separate the influential dimensions of tangible heritage (deeply linked to castles, palaces, or buildings with military functions or exhibiting family wealth) from the influential dimensions of intangible heritage (connected to popular traditions). Finally, the third research gap concerns the need to reveal whether classified heritage responds to stimuli from specific sectors, namely tourism (which presents a symbiotic association with the existence of classified heritage).

This article, a pioneer for the Portuguese case, discusses determinants for the heterogeneous distribution of classified objects of tangible and intangible heritage. It is structured into the following sections. Section 2 reviews the literature and describes the phenomenon of distribution of tangible and intangible heritage across the 308 municipalities in the country. Section 3 presents the methodology for estimating a model capable of explaining the heterogeneity described in section 2. In section 3, we use estimation methods such as Poisson, generalised Poisson, or negative binomial for this empirical objective. We discuss additional statistics for more robust inference and explore the possibility of zero-inflated Poisson or zero-inflated negative binomial models. Section 3 also discusses the results of the regressions in light of the literature, as well as the controversy surrounding the distribution of heritage in Portugal. Finally, section 4 offers concluding remarks.

2. Heritage in Portugal: between regional development and tourism dynamics

2.1. General framework

We consider heritage to be the expression of any legacy considered relevant to a community, a country or humanity. As Moreira (2006) states, "patrimony" (the Latin root of heritage) is reminiscent of the Latin idea of paternal inheritance.

The evolution of the concept of heritage has not been linear. The current framework in Portugal (and in most European countries) depends largely on the international discussion that took place around UNESCO documents, emanating more intensely and frequently from the 1950s onwards, and, obviously, on stimuli from the European community.

Until 1945, heritage preservation in Portugal was closely linked to the religious framework (especially until the 19th century) and family capitalisation (wherein wealthy families "accumulated" heritage as a mark of social presence). Even small heritage objects or those more exposed to temporal erosion (such as books or other personal objects) survived because they were considered valuable in three dimensions: as timeless communion with the past (very typical of religious or idiosyncratic communities), as an appreciation of the family community and as sources of their own charisma (e.g., personal or sacred relics bequeathed by charismatic figures). Apart from that, the randomness of the processes, the contagious zeal of certain local or regional figures and an endogenous spirit of "cultural respect" help to explain the remainder of the heritage surviving until the 19th century. At that point, the expansion of knowledge, the discussion conducted by civil society groups and academics, the democratised educational level, and the growing interventionism of the state on the subject helped to identify and value heritage objects.

In 1945, after the Second World War, new interpretations of heritage were also considered. The Venice Charter appeared in 1964, revolutionising the area. There was the development of a complex institutional network with organisations such as UNESCO, ICOM (International Council of Museums), ICCROM (International Center for the Study of the Preservation and Restoration of Cultural Property) and ICOMOS (International Council on Monuments and Sites) (Moreira, 2006).

There are four stages related to the identification, certification and management of heritage: "preexistence", revelation, valuation and conservation/ restoration. For pre-existence, we perceive the construction, building and broad production of heritage objects. At this stage, the object is created. Be it a castle, a palace, a book, or a dagger, someone (individually or in a community) wanted the object to exist, gathered resources, designed it, and created it. Motivated by specific needs and contingent on a more immediate deadline, at this stage the object appeared in order to respond mainly to the needs of individuals and surrounding communities.

In the second stage, the surviving object is "revealed": it is identified as a surviving object, as something valuable, and it is studied and disseminated among individuals who attribute a special appreciation to it.

In the third stage, we have valuation: here, curators promote the exhibition of the heritage object as well as its valuation by the enlarged public. Finally, in the fourth stage, we have moments of conservation and restoration by the "heir" communities, as well as their projection/delegation to future communities, making the object fit into a context of multidimensional sustainability (be it cultural, historical, environmental or economic). It is worth remembering that, at all these stages, there are costs and benefits – assessable both monetarily and non-monetarily.

2.2. Heritage, economic development and tourism dynamics: our research hypotheses

We understand economic development to be the process of changing the quality of life of the community, which is a result not only of economic growth but also of the good functioning of institutions, as well as a consequence of processes of social cohesion, namely the redistribution of income, the inclusion of individuals in processes of collective choice and the benefit of the production result (Galbraith, 1979).

As several authors have demonstrated (Stipanovic, 2018; Creigh-Tyte, 1997), more development leads to community innovation in valuing the assets it holds, but also in identifying new assets. Communities with higher development levels regard historical ruins as a source of knowledge but also as an element of communion with past communities (e.g., Loulanski & Loulanski, 2016). The ruin stops being a ruin and becomes heritage for these developed communities.

It is not surprising that the central places of the community tend to have a greater concentration of inventoried heritage. Even so, communities associated with a higher standard of economic development show a greater capacity to identify heritage and value it in alternative spaces beyond central places (Grimshaw & Mates, 2022; Ashworth & Kavaratzis, 2011).

In this set of processes, some literature has shown that the presence of technicians or public officials associated with decentralised units of certain ministries increases the probability of there being a public classification of the community's heritage (Mourao & Martinho, 2022). For example, decentralised delegations from the Ministries of the Environment or Agriculture tend to result in the surrounding locations having a greater number of trees of public interest, just as delegations from the Ministries of Tourism or Culture are associated with a greater number of points of tourist interest.

Within the role of public promotion, we cannot forget the dynamics of specific programmes or territorial incidence. In particular, cross-border heritage programmes have been a relevant source of preservation and appreciation of heritage objects, not only in Europe but on other continents as well (Liberato et al., 2018; Freire-Lista et al., 2022).

Finally, literature also proves that, in certain places, the influence of regional action groups and civic associations significantly helps the preservation of existing heritage – whether tangible or intangible – and the identification of new heritage objects (Maslov, 2019).

But the dynamics of historical and cultural heritage are also dependent on the dynamics of tourism. In addition to the structural influence coming from economic development outlined above, several works (e.g., Bhandari, 2019; Biseko, 2018) show that regions with a tourist vocation have a special interest in both preserving the existing heritage and identifying new heritage objects.

Additionally, new sources of heritage interest entail a renewal of previous tourist flows (Bhandari, 2019). Therefore, places with a tourist vocation have a reinforced interest in promoting the identification and officialisation of heritage objects.

Locations with higher values in variables such as cashouts (Euros per capita from ATMs), tourists (% residents), available beds (for tourism) or beds for tourism (% available) tend to have higher tourist flows and a greater expected number of heritage objects. In Portugal, being a municipality on the coast additionally indicates a reinforced tourist vocation (Pinto et al., 2011) while the variable of ATM per resident tends to signal problems of demographic density and low tourist attractiveness.

Therefore, we formulate the following as our research hypothesis:

"The number of objects classified as tangible or intangible heritage of a municipality in Portugal depends on the level of development of the space, the centrality of the region, as well as the quality of the tourism sector."

2.3. The current debate in Portugal

In the literature, it is worth highlighting the importance of this moment for the debate on the distribution of heritage objects in Portugal.

First, prior to this work, there has been no study to identify the causes of the profound heterogeneity in the distribution of heritage located throughout the country. As the next section shows, some municipalities and regions have a significant number of classified heritage objects while others do not. Understanding the driving factors of the former spaces and the blocking factors of the latter spaces is, in our opinion, an essential step towards better management, conservation and enhancement of heritage throughout the country.

Second, a profound change in the management of cultural heritage in Portugal is underway. Changes in the attribution of responsibility for public facilities such as museums and in the organisational structure of the decentralised departments of the Ministry of Culture require detailed analysis to contribute to the moment of open discussion.

Finally, the heritage of communities is an important source of both economic development and tourist stimulation. As Portugal's economy is based on tourism, there is an urgent need to expand the discussion of the country's tourism management, which involves the sustainability and preservation of its existing cultural heritage.

As an Appendix, we describe the current distribution of heritage in Portugal. So, we easily

understand how this research is relevant for contributing to this current debate.

3. Methodology

To assess the number of heritage objects identified in each Portuguese municipality – whether of a tangible or intangible nature – we model our regression as follows:

$$y_i = x_i'\beta + e_i$$

Our dependent variable (y_i) is discrete; it can take on integer values, including 0, with the value generally representing the most significant number of observations. Thus, the appropriate regression models for an initial assessment are the Poisson, negative binomial and generalised Poisson models (King, 1988; Gujarati, 2004; Hausman et al., 1984). There is abundant literature on various aspects of these models, including the probability mass function, the probability density function of each distribution, and the associated expectation of Y and of the variance of Y. However, in the following, we focus on the respective regression of each model to study the probability that a given Portuguese municipality has an observed number of heritage objects.

In the case of Poisson modelling, we take Yi to refer to the number of heritage objects in municipality *i* observed on the date of our data collection (June 30, 2023). Assuming that they follow a Poisson distribution with an average value of λ_p then the probability of finding a value of *y* in *i* is given by:

$$P(Yi = y) = \frac{e^{-\lambda_{\lambda}y}}{y!}, y \ge 0, \dots, \lambda i > 0,$$
(1)

In this model, we have a very important assumption:

$$E(Y) = var(Y) = \lambda \tag{2}$$

Using the vector X_i of m exogenous variables (vector of dimension $1 \times m$) and the vector β (of dimension $m \times 1$), we estimate the probability of observing y heritage objects in municipality *i* in the following model:

$$P(Yi = y, Xi) = \frac{e^{-\exp(Xi\beta)}\exp(Xi\beta)^{y}}{y!},$$
(3)

The generalised Poisson model allows modelling without restriction (2); that is, it allows there to be a level of variance of the dependent variable significantly different from the mean (Hoef & Boyeng, 2007). In this case:

$$P(y;\mu;\phi) = \left(\frac{\mu}{1+\mu\phi}\right)^{y} \frac{(1+\mu\phi)^{y-1}}{y!} \exp\left(\frac{-\mu(1+\phi y)}{1+\mu\phi}\right); y=0,1,2,\dots$$
 (4)

It is worth mentioning that, in the generalised Poisson model, the average value is μ and the variance is given by $\mu(1+\phi \mu)2$. Finally, the negative binomial model is based on the following model of the probability distribution:

$$P(Yi = y) = \frac{\Gamma(y+v)}{\Gamma(y+1)\Gamma(v)} \left(\frac{v}{v+\lambda i}\right)^{v} \left(\frac{\lambda i}{v+\lambda i}\right)^{yi} , y \ge 0, \dots, \lambda i > 0$$
(5)

and λi

It is important to note that Γ refers to the gamma function just as v equals $1/\alpha$, with α being a parameter of the overdispersion observed in the data. Thus, the expected value for Y_i is given by:

$$E(Yi) = \lambda i = \exp(Xi\beta) \tag{6}$$

$$var(Yi) = \lambda i(1 + \alpha \lambda i)$$

To estimate these regressions, maximum likelihood methods are used (Cameron & Trivedi, 2013). If α is positive, this indicates the existence of overdispersion, and so the model based upon the negative binomial distribution must be preferred over the Poisson model. This assessment must be complemented with information criteria (like the Akaike information criterion (AIC) or Bayesian information criterion (BIC)), as Cameron and Trivedi (2013) suggest.

3.1. Results

To analyse the distribution of heritage in Portugal, we carried out an official survey based on the following sources, under the responsibility of the General Directorate of Cultural Heritage:

- Cultural Heritage/General Directorate of Cultural Heritage: http://www.monumentos.gov.pt/Site/ APP_PagesUser/SIPA.aspx?id=25163
- Property Heritage Search: https://www. patrimoniocultural.gov.pt/pt/patrimonio/ patrimonio-imovel/
- Intangible Heritage Research: https://www. patrimoniocultural.gov.pt/pt/patrimonio/ patrimonio-imaterial/

We therefore carried out a survey regarding all tangible and intangible heritage objects identified in each Portuguese municipality (as of June 30, 2023). For each municipality, using the PORDATA Portal (https://www.pordata.pt/), we also collected data on the socio-economic variables for the same 308 municipalities as has been proposed by the literature.

We collected variables related to administrative centrality:

- Being an administrative headquarter (of a district)
- Having decentralised delegations (Ministries of Culture, Economy or Tourism)
- Year of municipal creation
- Being a frontier municipality (bordering Spain)

We also studied variables related to the economic dynamism of the municipality:

- Density (residents/km²)
- Municipal cultural expenditures (euros *per capita*)
- Municipal capital expenditures (euros per capita)

Finally, we also included variables related to tourism dynamics:

- Number of trees of public interest
- Residents
- Cashouts (euros per capita from ATMs)
- ATMs per resident
- Tourists (% residents)
- Available beds (for tourism)
- Beds for tourism (% available)
- Being a seaside municipality

Below are the main stages of our empirical analysis:

- 1. Discussion of the distribution of variables, using descriptive statistics.
- 2. Assessment of the possibility of multicollinearity between the explanatory variables, either by using correlation matrices or by discussing measures such as variance inflation factor.
- 3. Data modelling, as well as evaluation of the quality of the Poisson, negative binomial and generalised Poisson regressions.

Table 1 shows the descriptive statistics of our variables. As a brief comment, we highlight that the highest value for many of the variables is located in the municipality of Lisbon. Such is the case with tangible cultural heritage, capital expenditures, number of trees of public interest, residents and cashouts. Albufeira (a municipality in the region of Algarve) has the highest value for available beds for tourism (as a proportion of available beds). Trofa and Amadora are the youngest municipalities (both created in 1998), and the municipality of Mogadouro has the highest value of objects considered as intangible cultural heritage.

Table 2 presents the matrix of correlation coefficients involving the variables analysed in our study. In combination with Table 3, the risk of multicollinearity problems in our estimations is significantly reduced (Cramer, 1992). Specifically, most correlation coefficients have values below 0.6, and the VIF score associated with each variable is below 10.0.

In order to lay the foundations for a more exhaustive debate, in the following we present the most significant correlation coefficients, involving the variables "Number of immovable heritage objects" and "Number of intangible heritage objects".

The correlation coefficient between these two variables is 0.254, which demonstrates that the identification of intangible heritage is still a process that affects a small number of municipalities (as opposed to material heritage). It is also not surprising that few variables show significant correlation coefficients with the number of intangible heritage objects, with only the number of residents in the municipality (0.160) and being a border municipality (0.199) yielding significant correlations.

Regarding objects of tangible heritage, the variables with the most significant correlation coefficients are guests in hotels (0.699), gross value added per employee (0.747) and municipal expenditure on capital items (0.708). Also significant are the correlation coefficients between the number of material heritage objects and the following variables: current municipal expenses (0.506), number of trees of public interest (0.732), whether the municipality is a district capital (0.504) and number of residents (0.677).

Table 3 only reveals the VIF scores of the variables included in our modelling (scores below 10.0). The remaining two variables ("Companies' turnout" and "Added value per employee"), whose VIF scores were calculated as greater than 10.0, were excluded.

Table 4 exhibits the outcomes for intangible cultural heritage in Portuguese municipalities.

Next, to discuss our inferences from the estimations in Table 4, we would only infer from the Poisson regression model whether the overdispersion assumption is fulfilled. We can confirm that the p-value from the t-test is below the significance level, thus rejecting the null hypothesis. Additionally, we confirm that the value of deviance when divided by the degree of freedom is greater than one, which is a further evidence

Table 1. Descriptive Statistics (n = 308, year 2023)

	Mean	Standard deviation	Minimum	Maximum	
Administrative headquarter	0.0611	0.2400	0	1	
Decentralised delegations					
(Ministries of Culture, Economy	0.0179	0.1331	0	1	
or Tourism)					
Year of municipal creation	1406.414	244.994	1055	1998	
Frontier municipalities	0.1402	0.3479	0	1	
Density (residents/km ²)	880.622	5156.967	4.4	45268	
Municipal cultural expenditures	3065.011	7842 211	27.4	109271 4	
(Euros per capita)	5005.011	/042.211	27.4	107271.4	
Municipal capital expendtures	3997 /36	5807 831	1 1553	69059.4	
(Euros per capita)	5777.450	3007.051	1.1555	0,00,00	
Number of trees of public interest	1.9604	5.9463	0	84	
Residents	35689.42	57238.1	1763	518494.7	
Cashouts (Euros per capita from	2012 925	599 579	850 222	4015 667	
ATMs)	2012.035	377.375	050.555	4713.007	
ATMs per resident	11.4383	3.6615	3.633	27.8	
Tourists (% residents)	47.102	22.793	0	328.415	
Available beds (for tourism)	269.2917	1174.245	0	16576.77	
Beds for tourism (% available)	18.6185	16.4936	0	62.3667	
Seaside	0.2230	0.4170	0	1	
Intangible cultural heritage	0.2458	0.6354	0	6	
Tangible cultural heritage	16.8701	24.5804	0	298	

Source: own study

of overdispersion, as abundantly documented in the literature.

Empirical literature also suggests that the issue of overdispersion can be fixed by modelling with the negative binomial regression and generalised Poisson regression because, as we have already noted, these methods do not neglect the dispersion parameter in the estimation process.

By referring to the measures of regression quality in Table 4 (namely, information criteria and log-likelihood), we observe that the negative binomial estimation provides better values (lower AIC and BIC and higher log-likelihood). Table 4 also provides the incidence rate ratios (IRRs) and the respective standard errors estimated for the models. (The related base coefficients can be shared upon request to the authors.) An IRR higher than 1 suggests that increased values of the variable also increase the expected number of objects classified as intangible cultural heritage; conversely, an IRR lower than 1 suggests that increased values of the variable tend to diminish the expected number of objects classified as intangible cultural heritage.

Focusing on the inference from the negative binomial estimation, we can reach the following conclusions.

The dimensions that increase the number of intangible heritage inscriptions are those related to centrality (being an administrative headquarter), being a border municipality and the dynamics of tourism. Thus, we found that Portuguese municipalities that are the headquarters of traditional administrative districts tend to have an IRR greater than 3. Municipalities that were identified as close to the border with Spain also had a significant IRR. Finally, with an IRR slightly above 1.0, we have the variables associated with tourism dynamics, namely cashouts, tourists as the percentage of residents and the percentage of beds available for tourism.

In turn, the dimensions with an IRR that significantly tends to reduce the number of intangible heritage objects are those related to being on the coast (IRR 0.46), having more trees of public interest (IIR 0.90) and having a decentralised delegation from one of the ministries considered (Ministries of Culture, Tourism or Economy; IRR 0.46).

Based upon these original results, we can discuss the distribution of intangible heritage in Portugal. This type of classified heritage aims to conserve community practices and knowledge. Our results confirm, once again, that communities around central places (namely, in administrative district headquarters) have a greater possibility of seeing their ancestral practices and knowledge classified as intangible heritage. Moreover, the application of community funds in cross-border areas was found to be very stimulating for this purpose as well. These results agree with the findings of Freire-Lista et al. (2022), Pardellas and Padin (2004), Lopez-Villuendas and del Campo (2022), Ranf and Dumitrascu (2011) and Kopvak and Lebid

Table 2. Correlation matrix

	а	b	с	d	e	f	g	h	i
a	1.000								
b	0.254	1.000							
с	0.441	0.074	1.000						
d	0.506	0.071	0.966	1.000					
e	0.708	0.155	0.465	0.493	1.000				
f	0.359	0.045	0.776	0.821	0.375	1.000			
g	0.722	0.083	0.467	0.546	0.710	0.414	1.000		
h	0.210	0.030	0.194	0.186	0.242	0.179	0.286	1.000	
i	0.503	0.172	0.211	0.206	0.395	0.101	0.374	0.161	1.000
j	-0.005	0.199	-0.076	-0.087	-0.132	-0.113	-0.082	-0.173	0.011
k	0.196	-0.007	0.131	0.193	0.360	0.199	0.228	0.160	0.101
1	-0.206	-0.123	0.096	0.086	-0.110	0.239	-0.076	-0.033	-0.200
m	0.154	0.074	0.019	0.017	0.008	-0.021	0.025	0.139	0.459
n	0.355	0.042	0.779	0.823	0.371	0.994	0.410	0.180	0.099
0	0.747	0.091	0.559	0.652	0.737	0.559	0.870	0.135	0.289
р	0.677	0.161	0.607	0.694	0.680	0.701	0.669	0.313	0.338
q	0.447	0.076	0.323	0.357	0.484	0.290	0.377	0.094	0.369
r	0.257	-0.124	0.161	0.193	0.276	0.077	0.244	-0.054	0.314
s	0.699	0.077	0.486	0.582	0.772	0.429	0.794	0.092	0.288
t	0.032	-0.042	0.031	0.089	0.242	0.019	0.029	-0.041	-0.007
u	0.254	0.173	0.118	0.135	0.245	0.057	0.134	0.203	0.155
v	0.285	0.092	0.167	0.217	0.356	0.122	0.208	0.166	0.140

	j	k	1	m	n	0	р	q	r
j	1.000								
k	-0.164	1.000							
1	-0.171	0.078	1.000						
m	-0.060	-0.022	-0.066	1.000					
n	-0.112	0.192	0.244	-0.020	1.000				
0	-0.066	0.214	-0.036	-0.003	0.555	1.000			
р	-0.160	0.390	-0.013	0.073	0.696	0.745	1.000		
q	-0.019	0.498	0.058	0.120	0.287	0.427	0.436	1.000	
r	0.007	0.232	-0.071	0.100	0.075	0.308	0.134	0.670	1.000
s	-0.055	0.257	-0.064	0.015	0.424	0.884	0.622	0.532	0.429
t	0.012	0.313	0.062	-0.011	0.016	0.056	0.041	0.415	0.373
u	0.0118	0.603	-0.007	0.094	0.055	0.071	0.227	0.488	0.227
v	-0.034	0.638	0.031	0.112	0.118	0.187	0.294	0.542	0.326

	s	t	u	v
s	1.000			
t	0.435	1.000		
u	0.177	0.345	1.000	
v	0.337	0.527	0.809	1.000

Legend – a: Tangible cultural heritage; b: Intangible cultural heritage; c: Municipal cultural expenditures (euros per capita); d: Municipal current expenditures (Euros); e: Municipal capital expenditures (euros per capita); f: Density; g: Trees of public interest; h: Existence of trees of public interest; i: Administrative headquarter; j: Frontier municipalities; k: Seaside; l: Date of creation; m: Decentralised delegations; n: Tourists (% residents); o: Added value per employee; p: Residents; q: Cashouts (euros per capita from ATMs); r: ATMs per capita; s: % available beds occupied; t: Beds for tourism; u: Hotels; v: Companies' turnout

Variable	VIF	1/VIF
Hotels	6.65	0.150
Number of Trees of public interest	4.39	0.227
Tourists (% residents)	4.12	0.242
Residents	3.72	0.269
Cashouts	3.49	0.286
Culture expenditures	2.82	0.354
Capital expenditures	2.66	0.376
ATMs per capita	2.56	0.390
Beds for tourism	2.25	0.445
Seaside	1.94	0.514
% available beds occupied	1.85	0.540
Administrative headquarter	1.79	0.559
Decentralised delegation	1.28	0.779
Date of creation	1.27	0.788
Frontier municipality	1.20	0.830
Density	1.08	0.922
Mean VIF	2.69	

Table 3. VIF Scores

Notes: Standard errors in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *. Dispersion parameter analysis for Poisson regression: (1/df) Deviance = 6.916767; (1/df) Pearson =12.78865

(2022). In sum, our results prove that the dynamics of increased tourism are associated with a higher number of intangible heritage objects within a given municipality.

The results relating to coastal municipalities also deserve reflection. It seems that coastal municipalities generally do not focus on intangible heritage, which leads to a lower concentration of such heritage objects in these municipalities. Instead, such municipalities have a relatively high concentration of other heritage objects, namely trees of public interest (Mourao & Martinho, 2017). Finally, the very presence of certain decentralised delegations can divert the attention of communities and local agents to other priorities, namely monumental heritage (Table 5).

Next, let us examine the results obtained for the distribution of tangible heritage objects (Table 5).

The results displayed in Table 5 confirm that the Poisson estimation presents overdispersion also in the regression related to tangible objects. Additionally, based on the AIC, BIC and loglikelihood criteria, the negative binomial estimation outperforms the generalised Poisson estimation. Therefore, for inference purposes, we highlight the following.

Central municipalities, as district headquarters, tend to have a higher number of monuments and other heritage objects of a material nature (IRR 2.2). Here, contrary to what is observed in Table 4, the presence of decentralised delegations of the Ministries of Economy, Tourism or Culture increases the number of classified heritage objects (IRR 1.14). Being a municipality that borders Spain also increases the number of objects classified as material heritage (IRR 1.14). Variables associated with tourism dynamics also show a positive effect on the number of classified heritage objects, namely residents, density and beds for tourism. Municipalities with a higher volume of capital expenditure are also associated with a greater number of tangible heritage objects.

However, other dimensions are important to consider, as they are associated with a lower number of tangible heritage objects. The first such variable is being bordered by the ocean (IRR 0.75). Additionally, municipalities with lower density, also suggested by the variable ATM per resident (IRR 0.95), are likely to have fewer classified material heritage objects. The year of municipal creation (IRR 0.99) deserves a complementary comment, as older municipalities have had a greater chance

	Poisson	Generalised Poisson	Negative binomial
Administrative headquarter	3.284**	3.431**	3.387**
	(1.817)	(1.964)	(1.899)
Decentralised delegations	0.767	0.752	0.459*
(Ministries of Culture,	(0.325)	(0.323)	(0.213)
Economy or Tourism)	(0.525)		(0.213)
Year of municipal creation	0.9992	0.9993	0.9994
	(0.0008)	(0.0007)	(7e-4)
Frontier municipalities	2.772***	2.562**	2.122**
	(0.961)	(0.977)	(0.768)
Density	1.0053	1.0055	1.0057
	(0.0038)	(0.0040)	(0.004)
Cultural expenditures	0.9999	0.9999	0.9991
-	(0.00006)	(0.00006)	(5e-5)
Capital expenditures	1.00003	1.00003	1.000026
	(0.00004)	(0.00004)	(4e-5)
Number of trees of public	0.898*	0.891*	0.904*
interest	(0.052)	(0.054)	(0.053)
Residents	1.00034	1.00053	1.00003
	(4e-6)	(4e-6)	(4e-6)
Cashouts (from ATMs)	1.0018***	1.0019***	1.0014**
	(0.0005)	(0.0006)	(0.0006)
ATMs per resident	0.6616***	0.656***	0.682***
I I I I I I I I I I I I I I I I I I I	(0.059)	(0.063)	(0.062)
Tourists (% residents)	1.000003*	1.000003*	1.000003*
	(2e-6)	(1.8e-6)	(2e-6)
Available beds (for tourism)	0.9995	0.9994	0.9992
	(0,0004)	(0,0004)	(0.0005)
Beds for tourism (%	1 033***	1 035***	1 036***
available)	(0.012)	(0.014)	(0.013)
Seaside	0.767	0.752	0.459*
ocubide	(0.325)	(0.323)	(0.213)
AIC	(0.525)	(0.525)	(0.213)
BIC	207.177	377.66	314 606
LogLikelihood	517.751	322.00	514.000
LogLikelihood	-116.0885	-115.8779	-111.803

Table 4. Intangible cultural heritage (estimated values: Incidence Rate Ratios)

to accumulate material heritage than newer municipalities.

These results validate the findings of Heath and Wall (1992), Provenzano (2014) and Pavlovich (2014) that highlighted the concentration of points of heritage in central spaces, through either supply movements (namely, historical accumulation) or demand movements (due to a greater density of people, tourists and other observing agents and promoters of the classification). This concentration of agents or promoting communities exerts a leveraging effect in the development of processes leading to the final classification of an object as a heritage site of public interest. In this regard, a large number of decentralised delegations from various ministries competes within these processes. However, our results express an additional concern: less dense spaces run the risk of having a smaller number of classified heritage objects, since it may be easier to neglect those objects already classified as heritage (Mourao, 2020).

	Poisson	Generalised Poisson	Negative binomial
Administrative headquarter	2.171***	2.059***	2.292***
	(0.119)	(0.342)	(0.528)
Decentralised delegations	1.146*	1.264	1.265
(Ministries of Culture,	(0.093)	(0.284)	(0.464)
Economy or Tourism)			
Year of municipal creation	0.9999***	0.9994***	0.9993***
	(0.00007)	(0.0002)	(0.0002)
Frontier municipalities	1.141***	1.150**	1.454***
	(0.051)	(0.136)	(0.196)
Density	1.00001***	1.00001	1.000004
	(3e-6)	(7e-6)	(8e-6)
Cultural expenditures	0.9999	1.00002	1.000004
-	(3e-4)	(3e-6)	(9e-6)
Capital expendtures	1.00002***	1.00001	1.00003**
	(3e-6)	(8e-6)	(0.00001)
Number of trees of public	0.989**	0.983***	0.977*
interest	(0.005)	(0.012)	(0.013)
Residents	1.000007***	1.000004***	1.00004 ***
	(2e-6)	(3e-7)	(9e-7)
Cashouts (from ATMs)	1.00035 ***	1.0002	1.00016
	(0.00005)	(0.0001)	(0.00014)
ATMs per resident	0.9456***	0.9651**	0.9585**
	(0.0072)	(0.017)	(0.0183)
Tourists (% residents)	1.0001	1.0001	e-6
	(e-7)	(4e-7)	85e-6)
Available beds (for tourism)	0.9999***	0.9999	0.9998*
	(2e-5)	(0.00005)	(0.00006)
Beds for tourism (%	1.019***	1.013***	1.018***
available)	(0.0013)	(0.003)	(0.0036)
Seaside	0.748***	0.784**	0.993
	(0.034)	(0.094)	(0.120)
AIC	3179.02	2024.98	2001.70
BIC	3240.69	2090.28	2067.21
Log-likelihood	-1571.51	-944.489	-982.85

Table 5. Tangible cultural heritage (estimated values: Incidence Rate Ratio)

Notes: Standard errors in parentheses. Significance level: $1\%^{***}$; $5\%^{**}$; $10\%^{*}$. Dispersion parameter analysis for Poisson regression: (1/df) Deviance = 8.396963; (1/df) Pearson = 9.132988

3.2. Zero-inflated Poisson and Zero-inflated Negative Binomial Models

Depending on the frequency of observations with an excess of values of 0 in the dependent variables, other models are also usually considered, namely zero-inflated Poisson or zeroinflated negative binomial models (Cameron & Trivedi, 2005; Desmarais & Harden, 2013). The relevance of these models compared to the previously estimated (Poisson, generalised Poisson or negative binomial) models can be assessed using information criteria. Tables 6 and 7 provide these statistics for tangible and intangible heritage across Portuguese municipalities using the entire set of explicative variables as before. (Additional details can be shared upon request to the authors.).

Tables 6 and 7 show that the zero-inflated versions of the Poisson model and negative

binomial model do not provide significant gain over the original specifications. Therefore, we do not discuss them further here (although all related tables are available upon request).

4. Discussion

Within the context of Portuguese classified heritage objects, our results validate previous research that suggests the relevance of central places. Our findings further demonstrate that the central spaces of each region/district have a greater probability of having more heritage objects. Whether due to historical accumulation or administrative prestige, these spaces tend to have a greater number of completed heritage classification processes. Our results were similar for tangible and intangible heritage.

On the other hand, these central places tend to be the populationally densest areas of Portugal. The concentration of services and jobs leads to a greater density of resident families. This dynamic contributes to the emergence of communities that are more aware of their heritage (Chen et al., 2017; Rakitovac et al., 2021; Leeuwen et al., 2013; Riganti & Nijkamp, 2008). This awareness will support the identification and, eventually, classification of heritage – whether tangible or intangible – as being of public interest. Additionally, our results confirm that cross-border projects or programmes influence the possibility of inventorying and classifying heritage. For both dimensions, especially in the case of intangible heritage, it was found that municipalities that share borders with Spain are likely to have more tangible and intangible heritage objects.

Whether due to community funds eligible for cross-border communities or to efforts to locate heritage in these spaces, the evidence in Tables 4 and 5 is clear: proximity to Spain has a positive effect on the identification and classification of heritage of public interest (Freire-Lista et al., 2022; Pardellas & Padin, 2004; Lopez-Villuendas & del Campo, 2022; Ranf & Dumitrascu, 2011; or Kopvak & Lebid, 2022).

In our discussion, the diffuse role of tourism dynamics also has a place. As previously pointed out by Johnstone et al. (2013), Corá et al. (2019) and Arbresha et al. (2020), places with greater tourism dynamics can trigger two vectors of action, promoting the inventorying and classification of heritage of public interest.

On the one hand, places with strong tourism dynamics have tour operators who have a special interest in promoting new points of cultural and heritage interest. There is a widespread perception among these operators (Yang & Lin, 2011) that both well-publicised heritage and new heritage elements attract more tourists and, with them, more

Table 6. Intangible cultural heritage (AIC, BIC and likelihood statistics for Poisson, generalised Poisson, negative binomial, zero-inflated Poisson and zero-inflated negative Binomial)

	Poisson	Generalised	Negative	Zero-inflated	Zero-inflated
		Poisson	binomial	Poisson	negative binomial
AIC	264.177	265.76	257.606	271.148	284.103
BIC	317.731	322.66	314.606	331.3959	343.102
Log-likelihood	-116.0885	-115.8779	-111.803	138.5652	-117.574

 Table 7. Tangible cultural heritage (AIC, BIC and likelihood statistics for Poisson, generalised Poisson, negative binomial, zero-inflated Poisson and zero-inflated negative binomial)

	Poisson	Generalised	Negative	Zero-inflated	Zero-inflated
		Poisson	binomial	Poisson	negative binomial
AIC	3179.02	2024.98	2001.70	3891.365	2031.425
BIC	3240.69	2090.28	2067.21	3956.662	2096.722
Log-likelihood	-1571.51	-944.489	-982.85	-3083.15	-1927.682

revenue for local businesses (Johnstone et al., 2013). Therefore, beyond specialised associations and public promoters, communities that live under this dynamic have a special predisposition to identify and seek the official classification of new heritage sites.

On the other hand, places with strong tourism dynamics bring in many visitors, thus increasing the observation of heritage points that are not yet considered to be of public interest. Thus, these flows also make it possible to increase interest in inventorying and classifying heritage objects.

However, as our results demonstrate, places with a greater hotel vocation (higher percentage of beds available for tourism) receive positive effects on the number of heritage objects catalogued. On the other hand, the scale of hotel capacity does not allow the same conclusion. This means that our results may indicate non-linear effects in this respect, relating tourism dynamics and effects on heritage conditioned to other dimensions that could be analysed in later work.

5. Conclusion

When we observe the distribution of classified heritage throughout a region or country, we see that it is distributed neither randomly nor in a balanced way. The present study provides evidence of this phenomenon in the case of classified heritage in Portugal.

When observing the distribution of classified heritage in Portugal, we see that many municipalities have a significant number of classified heritage objects (whether of municipal, national or even world interest). However, other municipalities, including even neighbouring ones, do not have such concentrations of heritage objects. On the one hand, this imbalance implies differences in the dynamics of associated cultural and tourist activities; on the other hand, it shows that different economic agents achieve different results in the promotion, classification and dynamisation of actions linked to the heritage of spaces.

The literature shows that most localities and regions have significant potential for heritage. However, some localities emerge with very successful dynamics – either because local promoters are more effective in identifying, inventorying and officially classifying or because the specific characteristics of the locations facilitate this success.

This original study tested all these insights in Portugal. After an exhaustive survey of all heritage objects classified in the 308 municipalities of Portugal, empirical models were estimated using Poisson, generalised Poisson and negative binomial regressions.

5.1. Practical recommendations

These estimations allow us to conclude that classified heritage clearly tends towards being concentrated in central locations. This result implies the need for additional attention to be paid to non-central locations. These non-central locations have a special potential to increase the number of classified heritage objects. However, if such objects are in locations with sub-optimal tourism dynamics, these non-central places run the risk of neglecting both the heritage already classified and the heritage that is in the process of being classified. Therefore, if Portuguese authorities and surrounding communities do not pay special attention on these objects, they may be lost.

5.2. Theoretical implications

Especially in the case of intangible heritage, it was found that the role of economic and cultural dynamisation programmes involving Euroregions and Eurocities is important. These programmes involve promoting actions with the participation of public and/or private agents on both sides of administrative borders (in this case, agents from Portugal and Spain).

Finally, our estimates highlight the role of tourism dynamics. Overall, our estimations confirmed that there is a positive relationship between tourist inflows and the dynamics of appreciation of classified heritage. This evidence, once again, has relevant implications. On the one hand, it shows that the management of classified heritage is a relevant element in generating tourist revenue in Portuguese spaces. On the other hand, spaces with weaker tourism dynamics need complementary stimuli to leverage their potential in the management of classified heritage.

5.3. Limitations

A first limitation of this work is related to the static nature of the database. These data (as well as the derived models) report on the country's situation in 2022 and 2023, but do not describe how classified heritage has been recognised over the years. A second limitation concerns the fact that the focus is on Portugal, requiring more countries to be observed for more generalised readings. Finally, there were dimensions endogenous to each municipality that may be relevant in explaining the heterogeneous distribution of classified heritage and that were not considered here – we refer, for example, to political leaders and civic movements associated with local heritage.

5.4. Future research

The present study allows for three primary lines of further investigation. First, we intend to detail the temporal evolution of the number of heritage objects classified in each territory. Second, we intend to extend this analysis to other European countries, to observe the robustness of the present conclusions. Third, we intend to detail the differentiated role of endogenous institutions in the heterogeneous distribution of classified heritage, namely party leadership in the municipal executive, the role of cultural associations and associative dynamics in the region, and the educational level of the resident population.

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Appendix - Current Situation of Heritage in Portugal

In this section, we present a brief analysis of the distribution of classified heritage objects in Portugal's NUTS2 and NUTS3.

<u>NUTS2 Norte (including NUTS3—Alto Minho,</u> <u>Cávado, Ave, Porto Metropolitan Area, Alto Tâmega,</u> Tâmega e Sousa, Douro, Terras de Trás-os-Montes)

The NUTS3 Alto Minho has a total of 223 classified tangible heritage objects, including 63 national monuments and 125 properties of public interest (in Portuguese, Imóveis de Interesse Público, or IIPs). Alto Minho ranks third among subregions in terms of amount of real estate heritage, following Porto Metropolitan Area and Douro. In relation to intangible heritage, it ranks second in the northern region, with a total of 13 intangible heritage designations, three of which are already classified: fishing in the fisheries of the River Minho (Caminha, Melgaço, Monção, Valença and Vila Nova de Cerveira), Festa das Rosas of Vila Franca (Viana do Castelo) and traditional knowledge and construction practices of 'cavaquinho', a small guitar (shared among several municipalities throughout the region). Ponte de Lima is the municipality in this NUTS3 with the largest number of classified monuments, with 52, 39 of which are IIPs, followed by Viana do Castelo, with 43. The municipality of Caminha has the largest number of national monuments, with 18. Vila Nova de Cerveira is the municipality with the lowest number of classified objects in this NUTS3, totaling seven.

The NUTS3 Cávado stands out for the number of classified immovable heritage objects, with a total of 149. In the Cávado sub-region, Braga stands out as the municipality with the highest number of classified heritage objects. It has 80 classified properties, including 18 national monuments and 33 IIPs. However, Cávado has only nine objects listed as intangible heritage, two of which have completed their classification: Lent and Solemnities of Holy Week in Braga, and traditional knowledge and construction practices of 'cavaquinho' in the municipalities of Amares, Braga and Vila Verde and other regions.

The NUTS3 Ave has a significant number of tangible heritage objects, totaling 130, with its highest concentration in Guimarães, with 58.

Like Cávado, Ave has nine identified intangible heritage objects, two of which have completed the classification process: the Festas Antoninas in Vila Nova de Famalicão, and the abovementioned traditional knowledge and construction practices of cavaquinho, extending to the municipalities of Guimarães, Vila Nova de Famalicão and other regions.

The Porto Metropolitan Area is the NUTS3 with the highest average population density in NUTS2 Norte and the second highest number of tangible assets classified or in the process of being classified, with 324 records, behind only the NUTS3 Douro.

In the Porto Metropolitan Area, the municipality of Porto has, in absolute numbers, the largest number of tangible heritage objects classified or in the process of being classified, with 136 records, and also has the largest number of IIPs and national monuments, with 51 and 24 records, respectively.

On the other hand, the municipalities that have fewer tangible heritage objects classified or in the process of being classified, both in absolute numbers and proportionally, are Espinho and São João da Madeira, both with only one registration in this category and no registration of IIPs and national monuments.

With regard to intangible heritage, the Porto Metropolitan Area sub-region has nine records, with only two having completed the classification process: traditional knowledge and practices of cavaquinho construction, which has local manifestations in the municipalities of Gondomar, Porto, Valongo, Vila Nova de Gaia and other sub-regions of the Norte, and wooden shipbuilding and repair techniques in Vila do Conde.

The NUTS3 Alto Tâmega stands out for having the smallest number of tangible heritage objects classified or in the process of being classified, with 93 records. The highest concentration is in the municipality of Chaves, which has a total of 27 properties classified or in the process of being classified, 16 estates of public interest and 6 national monuments.

It is important to note that the municipalities of Boticas and Ribeira de Pena have a common set of monuments jointly classified as an IIP, which is the Castro de Lesanho. Valpaços shares with Mirandela, which is part of the Douro sub-region, the heritage called "Set of Archaeological Sites of Serra de Santa Comba (Serra de Passos)", which is in the process of being classified. In turn, the municipality of Montalegre shares with the municipality of Vieira do Minho the Ponte de Mizarela, a heritage site classified as an IIP. As for intangible heritage, none of the municipalities in Alto Tâmega has records of this type.

The NUTS3 Tâmega e Sousa has five total registered intangible objects, two of which are

completed and three in the process of being classified. In relation to monuments, the region has 157 records, placing the sub-region as having the fourth most records in NUTS2 North.

The municipalities of Amarante, Penafiel and Marco de Canaveses have the highest number of registered monuments (26, 26 and 25 records, respectively). In relation to registered intangible heritage objects, the municipality of Amarante has the largest number of records in the NUTS3 Tâmega e Sousa, with three intangible objects registered.

The NUTS3 Douro has the highest number of classified properties in the northern region, with 327 registered properties, the majority of which are IIPs. However, in relation to registered intangible heritage, this sub-region stands out negatively, being the second smallest in quantity in the North, with only two records, both located in Vila Real.

The municipality of Vila Real thus stands out in this sub-region due to its two registered intangible heritage items: the process of making the black dinnerware of Bisalhães and the construction and collective traditional practices of Bombo in Portugal. In addition, Vila Real is the municipality with the highest number of records of tangible heritage in the NUTS3 Douro (44 in total, including 31 estates of public interest and 6 national monuments). Following Vila Real, we have the municipalities of Lamego, with a total of 35 registered objects, and Peso da Régua, with 32.

The NUTS3 Terras de Trás-os-Montes stands as having the largest number of classified intangible heritage objects, totaling 38, in addition to 121 tangible heritage objects. This difference may be due to the initiatives of the entity ZASNET-AECT (European Group for Territorial Cooperation), which has as one of its objectives to promote the region's cultural heritage. The association has been responsible for inscribing several cultural manifestations from Terra de Trás-os-Montes in the National Inventory of Intangible Cultural Heritage.

It is important to highlight that the headquarter of ZASNET-AECT is located in the municipality of Bragança, where there is a greater concentration of identified intangible and tangible heritage objects. The diversity of intangible heritage objects officially classified in Terras de Trás-os-Montes is evident: traditional knowledge and construction practices of cavaquinho in Bragança (and other municipalities in other regions), Carnival party of Caretos de Podence in Macedo de Cavaleiros, the process of making honor capes in Mirando do Douro and the Festa dos Caretos, dos Rapazes e de Santo Estevão de Torre de Dona Chama in Mirandela. NUTS2 CENTRO (including NUTS3 Oeste, Aveiro Region, Coimbra Region, Leiria Region, Viseu Dão-Lafões, Beira Baixa, Médio Tejo, Beiras and Serra da Estrela)

The NUTS3 Oeste has 152 records of tangible heritage objects, including 87 IIPs and 31 national monuments. Regarding the municipalities belonging to this NUTS3, Torres Vedras is the municipality with the largest number of both heritage records (31) and national monuments (9). However, the largest number of estates of public interest are located in the municipality of Alenquer. On the other hand, the municipalities with the lowest number of heritage records are Arruda dos Vinhos and Sobral de Monte Agraço, both with only two inscriptions. The latter, along with the municipality of Cadaval, has the lowest number of registrations with regard to IIPs (each with just one registration). With regard to intangible heritage objects, meanwhile, the numbers are quite different. NUTS3 Oeste presents only two records referring to intangible heritage: painting and singing the kings in the municipality of Alenquer and Festivals in honor of Our Lady of Nazaré in the municipality of Nazaré.

On the other hand, the NUTS3 of Aveiro presents 76 heritage records, including 36 IIPs and 6 national monuments. With regard to tangible heritage, the municipality of Aveiro has the highest number of both IIPs (10) and national monuments (4) in this NUTS3. In short, it is the municipality with the highest number of heritage registrations (22). Regarding intangible heritage objects, we note that with the exception of the municipalities of Aveiro (Cult of Saint Joana and Festivals of S. Gonçalinho), Ílhavo (Festivals in honor of Nossa Senhora da Penha de França) and Ovar (singing the kings), the remaining municipalities of the Aveiro region do not yet have any records relating to this type of heritage.

The NUTS3 Coimbra has more heritage records than Aveiro, with 220 total records, including 104 IIPs and 48 national monuments. The municipality of Coimbra stands out from the others. Besides having the largest number of heritage records (62), in this municipality the number of national monuments exceeds the total number of IIPs. The disparity between the municipality of Coimbra and other municipalities in this NUTS3 is significant, especially with regard to the total number of national monuments. As for intangible heritage, we can see that the municipality of Cantanhede only has one record of this type of heritage (Festival and pilgrimage of S. Tomé de Ançã).

The results obtained in the NUTS3 Leiria Region differ slightly from those obtained for other regions. Namely, there is a more homogeneous distribution among the municipalities in this NUTS3. This region has a total of 75 classified heritage records, including 38 IIPs and 14 national monuments. Three municipalities (Batalha, Leiria and Pombal) show very similar values in terms of the number of tangible heritage objects.

Regarding the NUTS3 of Viseu Dão Lafões, this NUTS3 presents 189 records of tangible heritage, of which 99 are IIPs and 25 are national monuments. The municipality of Viseu has the largest number of records, both in terms of IIPs (15) and national monuments (6). It is also the only municipality in this NUTS3 to have a record of intangible heritage (Flôr de Outubro de Fragosela).

The NUTS3 Beira Baixa has a total of 56 heritage registrations, including 31 estates of public interest and 6 national monuments. The municipality of Castelo Branco holds the highest number of tangible heritage objects, despite Idanha a Nova having a higher number of IIPs. These two municipalities are the only ones that have records of intangible heritage (traditional dances of Lousã in Castelo Branco and Bodo of Nossa Senhora da Consolação in Idanha-a-Nova).

Regarding the last NUTS3 of NUTS2 Centro, the NUTS3 Beiras and Serra da Estrela has 223 records of classified immovable heritage, including 122 IIPs and 36 national monuments. The municipalities with the largest number of heritage objects are Covilhã, Fundão and Guarda. Only two municipalities, Fundão and Sabugal, have records of intangible heritage, each with one record (construction of Bombos and Caixas and Capeia Arraiana, respectively).

NUTS2 Lisbon Metropolitan Area, Alentejo, Algarve, Açores and Madeira (including NUTS3 Algarve, Lisbon Metropolitan Area, Alentejo Litoral, Baixo Alentejo, Lezíria do Tejo, Alto Alentejo, Central Alentejo, Azores, Madeira)

The NUTS3 Lisbon Metropolitan Area is composed of 18 municipalities. This NUTS3 has a significant amount of classified heritage, with the highest number in the municipality of Lisbon, with a total of 298 records (144 of them being IIPs). Within this NUTS3, we also highlight Sintra, which has a total of 73 records. The remaining municipalities in this NUTS3 have lower numbers of IIPs and national monuments. In the municipalities of Loures, Mafra, Moita, Montijo and Odivelas, the total number of records exceeds 100. The municipalities of Alcochete, Almada and Amadora each have seven classified heritage objects. The municipality of Barreiro has 14 records, two of which are IIPs: the portico of the old church (florid Gothic) of Palhais (in the religious architecture category and church typology) and the Real glass factory of Coina (in the civil architecture category and factory typology). The municipality of Cascais has 60 examples of classified property heritage, 30 of them recognized as IIPs (in the military architecture and archaeology categories). In this NUTS3, there are five records of intangible heritage spread across five municipalities: Lisbon, Cascais, Amadora, Almada and Vila Franca de Xira.

Regarding the NUTS3 of the Alentejo Litoral, the municipality of Santiago de Cacém has the largest number of classified tangible heritage objects, with 32 records. Four of these are IIPs: Castelo Velho, with the ruins of the adjacent Roman city (in the archaeology/village category and archaeological itineraries of Alentejo and Algarve typology), Pelourinho de Alvalade, Pelourinho de Santiago do Cacém and the Pousada de Santiago do Cacém.

This municipality also has two monuments classified as national monuments (the castle and the main church of Santiago do Cacém, the first of which is registered in the military architecture category and castle typology, and the second in the religious architecture category and church typology). In the NUTS3 Alentejo Litoral, the municipality of Grândola has the second largest number of classified heritage objects, with a total of 15, six of which are IIPs: Necropolis of Cistas das Casas Velhas (in the necropolis typology), the Pedra Branca Dolmen (dolmen typology), the Megalithic Monument of Pata do Cavalo (tholos typology), the Lousal Megalithic Monument (tholos typology), the Roman dam of Pego da Moura (dams typology) and, finally, the Roman archaeological site of Cerrado do Castelo (spas typology). Grândola has one national monument, the Ruins of Troia (classified within the archeology category and ensemble typology). The municipality of Odemira ranks third, with nine examples of tangible heritage, including one IIP (Milfontes Fort, classified in the military architecture category and fort typology). Sines has seven records of classified tangible heritage, three of which are classified as IIPs: the Castle of Sines, the Fort of Nossa Senhora das Salas and the Fort of Pessegueiro, including the island with the same name, which also entails the fort from the Island of Dentro.

In the NUTS3 of Baixo Alentejo, the total number of elements classified or in the process of being classified as tangible heritage is 184. Most of the classifications are concentrated in Beja, Moura and Ferreira do Alentejo. There are two records of intangible heritage in this NUTS3—the baskets from Esteira de Ferreira do Alentejo and the intangible heritage of Canto Alentejano.

In the NUTS3 Lezíria do Tejo, IIPs and national monuments have a significant frequency in Santarém. With regard to the number of national monuments and IIPs, there is a clear predominance of IIPs. The municipalities with intangible heritage are Coruche, Salvaterra de Magos and Santarém.

The NUTS3 Alto Alentejo is a sub-region with a considerable area, made up of 15 municipalities. The total number of elements classified as material heritage in this sub-region is 139. The District capital (Portalegre) has 15 classified heritage records, while Elvas has 18 and Castelo de Vide has 27 classified monuments. Of the 15 municipalities, only two have records of intangible heritage: Nisa, with the production of stone pottery, and Campo Maior, with the Festas do Povo.

There are 14 municipalities composing the NUTS3 Alentejo Central. The municipality of Évora has the largest number of tangible heritage inscriptions, totaling 85 (27 of which are IIPs and 46 are national monuments). Estremoz stands out with the second largest number of records. Évora has also been awarded the title of UNESCO World Heritage Site.

In this entire NUTS3, only Arraiolos and Estremoz have records of intangible heritage, with the art of carpets in Arraiolos and clay figures in Estremoz.

Finally, regarding the NUTS2 Algarve, the NUTS2 Autonomous Region of Madeira and the NUTS2 Autonomous Region of the Azores, the records of tangible and intangible heritage are distributed unevenly in the municipalities of these regions. As for the municipalities with the largest number of registered heritage objects, the following municipalities stand out: São Miguel (with 82 records), Horta (67), Silves (64) and Faro (61). The municipalities with the smallest number of tangible heritage objects are Porto Santo (6), Calheta (6), Albufeira (5), Castro Marim (3), Corvo (3) and Nordeste on the island of São Miguel (2) in the Autonomous Region of the Azores. On average, in the Algarve there are 18.3 records of tangible heritage per municipality. In the Autonomous Region of Madeira, the average is 8.81, while in the Azores it is 14.21.

In these regions, intangible heritage has significantly fewer records than tangible heritage. Only five municipalities have records of intangible heritage: Faro, Loulé, Monchique, Angra do Heroismo and Praia da Vitoria. In Faro, the Festival in Honor of Nossa Senhora dos Navegantes - Ilha da Culatra is an intangible heritage, a festival whose greatest singularity is the holding of a river procession in the Ria Formosa. In the municipality of Loulé, the registered cultural manifestation is the cult of Nossa Senhora da Piedade de Loulé and is characterized by a set of religious practices within the scope of the Catholic church. The municipality of Monchique has as its intangible heritage a gastronomic dish, Bolo de Tacho, a typical sweet from the region. Finally, on Terceira Island (municipalities of Angra do Heroismo and Praia da Vitoria), the set of dances and comedies from the Carnival of Terceira Island have been classified as intangible cultural heritage.

In summary, we confirm a significant heterogeneity in the distribution of heritage objects throughout the country. Additionally, even within each region (whether NUTS2 or NUTS3), we observe a significant concentration of classified heritage objects in some municipalities compared to others, even among neighboring municipalities.

In the next section, based on the literature, we seek to identify the regional socio-economic dimensions, including tourist dimensions, which are associated with this distribution of Portugal's classified heritage.

