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FULL ARTICLE

Networking and spatial interactions: What contributes most to increasing museums' attractiveness?

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Abstract

Given the relevance of museums in promoting cultural, tourism and economic development in local territories, we investigate the influence of both spatial and non-spatial interactions on museum attractiveness. In particular, we assess whether non-spatial collaborations such as partnerships and networking, contribute to enhancing their level of competitiveness and if spatial dependence occurs among neighbouring museums. Additionally, we differentiate the analysis by considering various location typologies, that is, sites located in highly attractive and remote areas. Findings from this study can assist policy-makers in designing ad hoc strategies to encourage the active role of museums in their local context.

KEYWORDS
agglomeration externalities, Italian museums, museum routes, partnership and networking, spatial models

JEL CLASSIFICATION
C21, R12, Z11

1 | INTRODUCTION

In recent decades, museums have undergone a significant evolution, leading to changes that have expanded their roles and their economic and social impact. In addition to their traditional functions of conserving, preserving and public displaying collections, museums are now recognized for their fundamental role in directly fostering the

economic and social development of regions thanks to awareness campaigns and cultural education (Backman & Nilsson, 2018). The cultural heritage held by museums is commonly acknowledged as a driver of sustainable local development and economic growth (European Commission, 2014; Frey & Meier, 2006), of intangible cultural capital accumulation (Quaglione et al., 2017) as well as of educational processes and social regeneration (Everingham, 2003). Nowadays, museums are expected to fulfil new and diverse missions: to be inclusive and participatory within the local community, to meet the needs and desires of different audiences, to act as urban flagships (Florida, 2002; Florida & Mellander, 2010; Gutierrez-Posada et al., 2023) capable of generating significant tourism and economic flows, to enhance the brand of the place, to support health and well-being and reduce income inequality (Tubadji et al., 2022) continuing education and the creation of social capital. In addition, cultural heritage can be viewed as an engine of development due to its ability to increase the attractiveness of an area as a place to visit, live, invest and work in (Cerisola & Panzera, 2022a; Kourtit & Nijkamp, 2019). The relevant role of museums has been remarked and well summarized in the new definition of a museum provided by the International Council of Museums approved in Prague on 24 August 2022 as "*not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing*."

Given the central function of museums in promoting the cultural, tourist and economic development of entire local areas, recent public policies have emphasized the importance of fostering networks and agreements among different museums to enhance their active role within their territorial context. The key role of cultural networking has been recognized since 1987 when the Council of Europe's Santiago di Compostela Declaration identified 30 cultural itineraries around Europe with the aim of revitalizing the collective memory of Europeans through cultural and educational exchanges for young Europeans, supporting contemporary artistic and cultural practices, promoting cultural tourism and fostering sustainable cultural development.

In this context, Italy is an interesting case study. Italy boasts an extraordinary wealth of cultural heritage with nearly 5000 museums, galleries, collections, archaeological sites and monuments open to the public in 2018. With more such institutions than any other country in the world, Italy has 58 sites on the UNESCO World Heritage List, and there is at least one cultural structure within every 50 km squared of the country. Data on museum demand and visitor flows confirm this importance: in 2018, Italian museums attracted over 128 million visitors (of which 58.6 million were foreigners), almost 10 million more (+8%) than in 2017, equalling the total number of tourist arrivals in Italian accommodation facilities in the same year (ISTAT, 2019). The top 10 Italian cities with the highest concentration of visitors (55.5%) and the most attractive Italian museums, archaeological sites and monuments (54.87%) are, in order: Rome, Florence, Naples, Venice, Milan, Turin, Pisa, Pompeii, Siena and Verona. Moreover, the top 10 and 20 Italian museums in terms of the number of visitors account for 28.87% and 37.59% of total visitors, respectively, further highlighting the significant disparities in attractiveness at the territorial level. The Italian museum system is indeed characterized by a large number of small and very small museums, constituting about three quarters of the total. These museums face several challenges since they rarely attract media attention, lack substantial architectural structures, are closely tied to their respective territories, have limited international significance and are mostly managed by regional governments, municipalities or private stakeholders. As a result, they are often overlooked in official guidelines and legislative decrees (Minucciani, 2017).

Recognizing the need to support Italian cultural institutions, in 2018, the Italian Ministry for Cultural Heritage and Activities and Tourism (MIBACT) established the Museum Networks and Territorial Systems Commission to study potential forms of cultural heritage management through the synergy of museums throughout the national territory. The main objective of the commission is to draft guidelines for developing collaboration and co-operation strategies between public and private cultural institutions and local production entities, with the aim of increasing the usability of all cultural sites in Italy. Indeed, museum networking is fundamental to attract new audiences, build a resilient organizational foundation, enhance museums' role within the academic community and secure new resources and funding (Yarrow et al., 2008).

Despite the recent attention from local and national institutions to support museum networking and leverage agglomeration externalities to boost tourism destinations' attractiveness and promote economic and social development, to our knowledge, there are no empirical works that have analysed the effectiveness of both networking practices and spatial interactions in favouring agglomeration externalities between Italian museums. Therefore, in this study, we investigate the determinants of museum attractiveness focusing in particular on spillover effects from neighbouring museums and other forms of non-spatial collaboration. Specifically, in addition to considering museum characteristics such as organizational structure, museum typology, services offered and visitor support available on site, we investigate whether being part of a formal system of relationships and partnerships contributes to the performance of Italian museums. Moreover, we evaluate the presence of spatial dependence among museums to understand if the beneficial effects of museums on local communities tend to accumulate across space thanks to spatial interactions, and whether there are differences based on museums' location within the territory.

Therefore, we pose the following research questions: (Q1) Does non-spatial networking such as partnership agreements and alliances contribute to boosting the level of competitiveness of Italian museums? (Q2) Are Italian museums positively or negatively affected by the level of attractiveness of neighbouring sites? Furthermore, we differentiate the analysis by considering separately museums located in highly visited areas and in more isolated territories to understand which strategies are most effective for each museum type. Therefore, we pose two additional research questions: (Q3) Does the effect of partnerships and alliances on museums' attractiveness change depending on museums' location? (Q4) How do spatial interactions vary depending on museums' position in space?

To address these goals, we take advantage of an unconventional and still unexplored data source that offers many research opportunities to spatial economic researchers in the fields of regional sciences and cultural economics. Indeed, we merge the 2018 census survey of Italian museums which collects the main museum characteristics with the dataset 'Museum routes in Italy in 2018' provided by the Italian National Institute of Statistics (ISTAT) obtaining a new, unique and comprehensive dataset. Since museums routes are defined as road itineraries connecting the most visited site in each province with all neighbouring museums within a distance of 30 min by car, we are able to differentiate the analysis between museums located in highly attractive areas (i.e., belonging to a museum route) and those more isolated in space (i.e., not located on a museum route). The underlying idea is that museums located on a museum route are capable to take advantage of the attractiveness of a main museum, while peripheral museums are distant and isolated from the main attractive sites, potentially suffering from accessibility issues.

This work contributes to the regional sciences literature in several ways. First, to our knowledge, there are no previous studies that evaluate spatial dependence occurring across neighbouring Italian museums in terms of visitor flows by using specific spatial econometrics techniques. Second, no currently available papers have empirically investigated whether alliances and networking play an effective role in boosting visitor flows. Finally, the novel information about museum routes enables us to identify two distinct museum typologies—those located in central and peripheral areas—in which different spatial and non-spatial co-operation effects may occur. In sum, this is the only work that empirically investigates the role of both spatial and non-spatial interactions in affecting museum attractiveness taking into account museums' location typology. Empirical results from this analysis can be of great interest to policy-makers when designing *ad hoc* place-based policies and plans exploiting museum networking and agglomeration externalities to encourage the active role of museums in their local context.

2 | NETWORKING AND SPATIAL INTERACTIONS AMONG MUSEUMS

As highlighted by Torre and Rallet (2005), synergies among entities can occur in two distinct ways: through geographical or organizational proximity. While the former channel exploits geographical closeness, the latter relies on social and economic relationships to establish connections. In particular, we can refer to agglomeration externalities and non-territorial networks when considering interactions arising from geographical proximity and organizational

proximity, respectively. In this paper, we adopt this distinction and thus, we separately consider spatial and non-spatial interactions affecting museum performance.

Considering non-spatial linkages, museums' networking can take place at different levels, namely minimal, selective and full integration (Dornseif, 2001). The first level refers to collaboration structures in which two cultural institutions co-operate but maintain their individual services (hereinafter, we will refer to this first level as a partnership). In particular, they can organize joint exhibition projects, develop combined digital resources and engage in collaborative training courses, workshops and lectures. On the other hand, selective integration involves a form of networking in which museums share specific facilities, projects and departments, while in full integration they share common facilities and are involved in the same mission. Moreover, as recognized by Scrofani and Ruggiero (2013), museums can engage in both real and virtual networks. Indeed, thanks to new electronic technologies, museums can also collaborate with cultural institutions located at great distances, removing physical barriers and increasing access to resources for the so-called "remote users." Among the expected positive outcomes expected from networking practices, we find cost savings, wider access to initiatives and resources and the possibility to adopt new services thanks to increased financial support, ultimately leading to a richer experience for visitors and mitigating the disadvantages stemming from their limited size (Tulliach, 2017). Possible risks instead include the chance that one partner dominates the other and a lack of resources, proper preparation and commitment from one of the partners (Walker & Manjarrez, 2004).

In the empirical literature investigating the role of networking on museum performance, Plaza and Haarich (2015) found that the Guggenheim Museum of Bilbao substantially improved its economic position as a result of its international art-driven networks. Moreover, Wilson and Boyle (2004) qualitatively assessed the relevance of partnerships for four local authorities in Northern Ireland that formed a regional museum service. Focusing on the Valencia region, Li and Ghirardi (2019) showed that inter-museum collaboration enhanced technological innovation. However, more research needs to be done to clearly evaluate the impact of networking practices on museum performance since current research is very scarce, qualitative in nature and mostly refers to case studies.

On the other hand, one of the most recent trends in museum collaboration practices concerns the creation of connections among museums in the same area to share knowledge and resources with cultural institutions serving the same local community. Interactions with neighbours may, on one hand, improve service quality, visibility and reputation, but they can also be a source of frictions due to conflicts of interests between co-localized actors and reduced access to resources. In this framework, the papers by De Graaf et al. (2009), Cellini et al. (2020) and Kim et al. (2022) are the only contributions investigating the presence of spatial effects across Dutch, Italian and London attractions, respectively. In particular, De Graaf et al. (2009) estimated different gravity models for 108 Dutch museums, proposing several modifications to capture museum heterogeneity and spatial relationships. Their findings reveal that agglomeration effects occur between neighbouring museum, thus suggesting that the presence of several museums in a city may strengthen each other's position. Concentrating on Italy, Cellini et al. (2020) analysed whether museums' choices for service delivery are influenced by the choices of neighbouring museums in Italy using a spatial autoregressive (SAR) model. The main results of the analysis showed that spatial dependence holds, but only for public museums. Finally, Kim et al. (2022) examined the determinants of the attractiveness of London attractions from the theoretical perspectives of tourism demand theory taking spillover effects and macro determinants such as income, weather and search query volume into consideration. Their findings indicate that bidirectional spillover effects significantly impact neighbouring attractions, with heterogenous intensities and asymmetric effects across different pairs of attractions.

In this work, we extend the current literature on museum collaboration practices by considering both networking and spatial interactions among Italian museums. First, we consider whether being part of a network or system of museums through formal relationships of collaboration and/or partnership with other cultural institutions helps to enhance a museum's attractiveness. Second, we investigate whether being located near an attractive museum in terms of the number of visitors has a positive or negative effect on neighbouring museums. In particular, positive spatial dependence may arise if museums located in more attractive areas benefit from a strong network (peer

effect), while negative spatial dependence can emerge if visitors tend to choose which museum to visit at the expense of nearby museums leading to a severe competition across neighbours (substitution effect). Finally, we differentiate the analysis by considering separately museums located in highly attractive and remote areas in order to identify which form of collaboration is best suited to each museum typology.

3 | DATA AND DESCRIPTIVE STATISTICS

The database used for this analysis was created by merging two different datasets: the 2018 census data on Italian museums and the dataset "Museum routes in Italy in 2018," both provided by ISTAT.

The census data on Italian museums were collected by ISTAT through online questionnaires in an electronic format. Specifically, the managers of each Italian museum institution open to the public with regulated use were asked to provide specific information on the different characteristics of their museum, such as the typology of the artefacts or goods housed and exhibited, their legal nature, details about the objects on exhibition, the personnel employed, the financial resources used, the support available for the visit and the cultural activities and services offered to the public. Of the 5236 eligible units, 4908 museums and similar institutions were open to the public in 2018, classified into 3882 museums, galleries or collections, 327 archaeological areas and parks, 630 monuments and monumental complexes and 69 eco-museums (eco-museums are museums created to collect, study and archive local testimonies and experiences to enhance the material, natural and intangible heritage of the reference area). To precisely identify the location of each museum needed to perform our spatial analysis, we geocoded all 4908 Italian museums using the Google Geocoding API service.

The second dataset at our disposal consists of road itineraries connecting the museums and similar institutions surveyed by the ISTAT 2018 census survey. In particular, for each Italian province (NUTS3 level), the museum routes have been defined as all the itineraries connecting the more attractive museum in terms of number of annual visitors in each province (i.e., the main museum) to the other museums within a maximum driving time of 30 min. The aim to identify museum routes is to encourage the cultural development of the territory as a whole, decongesting the "fashionable" tourist destinations and distributing visitors to the lesser known but interesting structures. It is important to note that the routes identified by the ISTAT classification do not necessarily correspond to the MIBACT's proposal previously introduced. However, the routes identified by ISTAT align well with aims of this study, allowing us to distinguish between central and attractive museums and isolated and less frequented museums. Thus, this classification enables us to investigate if non-spatial and spatial forms of collaboration between museums differently improve the visibility of central and peripheral cultural institutions. These are central aspects for supporting different typologies of museums by suggesting *ad hoc* policy actions.

Figure 1 shows the museum routes as identified by the ISTAT classification and the peripheral museums which are not included in any itinerary. The routes presented vary significantly from each other, some are particularly rich in museums and other types of cultural heritage, some are concentrated in a single centre, and others are distributed through the many kilometres in the territory, beyond the borders of the province and of the region of reference.

The 107 museum routes are composed of 3770 roads crossing 2470 municipalities (50.5% of routes cross municipalities with UNESCO World Heritage sites) and reaching 2749 museum institutions (56% of all Italian museums, with 62.7% of them being public and 37.3% private). On average, there are 34 museums on each route, but with extreme variability (from 3 to 140 museum institutions in each route). This depends on various factors such as the historical-cultural identity of each area which varies greatly across the country, the road networks and the geography of the various territories that influences the extent of a route that can be travelled by car in 30 min. In terms of visitors, the 107 museum routes identified attract about a third of the total number of visitors (31.4%) to the 107 most popular museums and 86.6% of visitors considering all the museums belonging to the routes. On the other hand, the 2159 museums not reached by the routes only welcome 13.4% of all visitors to Italian museums, totalling 17 million visitors.

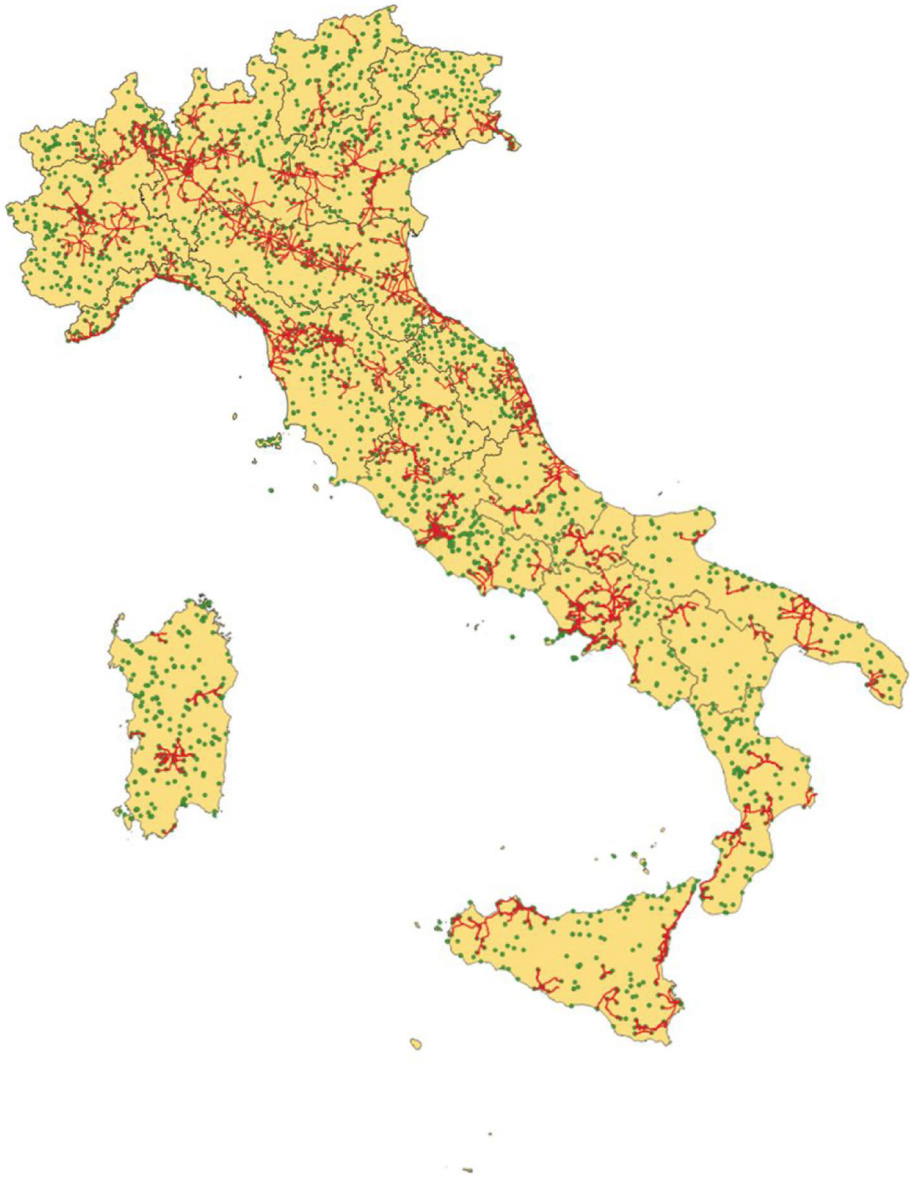

FIGURE 1 Museum routes across Italy. Red lines: Museum routes. Green dots: Remote Italian museums.

Table 1 shows some descriptive statistics on museums' characteristics differentiating among main museums (i.e., the starting point of the routes) and other museums located in highly attractive (i.e., belonging to a museums route) and remote (i.e., not in a museum route) areas. In particular, main museums are identified by ISTAT as the most visited museums in each province (a list of these cultural institutions with some descriptive statistics can be found in Table A2 in Appendix S1). Note that, since just one museum per province is recognized by ISTAT as the starting point of a route, only 14[1] main museums among 107 also belong to the top 30 mostly visited museums in Italy in 2018 (although the remaining 16 are reached by museums routes). Thus, despite main museums being highly visited by

[1]These museums are marked with an asterisk in Table A2 of Appendix S1.

TABLE 1 Descriptive statistics (mean values).

N	Overall 4908	Main museums 107	Attractive area 2642	Remote area 2159
Num. of visitors	26,210.25	382,692.7	27,999.22	8671.24
Num. paying visitors	15,096.61	188,530.7	16,729.78	5669.99
Num. foreign visitors	11,941.24	185,414	12,688.94	3550.25
Num. Italian visitors	15,953.86	200,500.3	16,957.01	5703.792
Num. of employees	11.80	58.49	13.04	7.82
Exposition area (*mq*)	1899.99	12,245.33	2098.86	1218.85
Revenues	48,139.3	377,752.8	53,656.0	27,397.3

definition, many top-ranked museums do not belong to this category. The descriptive statistics in Table 1 show that, as expected, the main museums host the largest number of visitors, both Italian and foreign, and have the largest exhibition area, number of employees and revenues. On the other hand, museums located in the surroundings of the main museums have intermediate sizes in terms of visitors and supply characteristics, while very small museums mainly belong to remote areas.

As a preliminary spatial analysis, we test the degree of association between spatial units in terms of the number of visitors using the global spatial autocorrelation index. By specifying an inverse distance matrix, the overall Moran's *I* index equals 0.08 ($z = 25.79$, p value $= 0.00$), indicating that Italian museums are affected by positive and significant global spatial dependence. However, differentiating between attractive and remote areas, the Moran's *I* computed on each of the two subsamples using again an inverse distance matrix reaches the level of 0.07 ($z = 15.49$, p value $= 0.00$) and 0.01 ($z = 1.62$, p value $= 0.11$) in the former and the latter case, respectively, indicating that only museums located in highly attractive areas benefit from significant agglomeration economies. A graphical representation of the index by areas is contained in Figure A1 in Appendix S1.

4 | THE MODEL

A SAR model (Elhorst, 2014) is used to capture and estimate the impact of non-spatial networking and agglomeration economies on museum attractiveness. The model includes the spatial lag of the dependent variable and is specified as follows:

$$Y_i = \rho WY_i + Partner_i\beta_1 + Network_i\beta_2 + \boldsymbol{V\zeta} + \varepsilon_i, \quad (1)$$

we define the dependent variable Y_i as the logarithm of the number of visitors to each museum, while the spatial lag WY_i accounts for the number of visitors to neighbouring museums, where the matrix W identifies the spatial structure of the data. In the general case, the spatial weight matrix is specified as an inverse distance matrix with elements equal to zero on the main diagonal and off-diagonal elements equal to $\frac{1}{d_{ij}}$, where d_{ij} is the distance in kilometres separating two spatial units i and j, with $i,j = 1,\ldots,N\ (i \neq j)$. Therefore, the parameter ρ captures global spatial dependence affecting Italian museums in terms of the number of visitors. The structure of the spatial weight matrix changes when we differentiate the analysis between the two location typologies. In particular, for highly attractive areas, we identify as neighbours those museums located on the same museum route and thus, the spatial weights equal the inverse of the distance between them. On the other hand, for remote areas, we build the spatial weight matrix as an inverse distance matrix based only on museums that do not belong to a museums route. The rationale is that, while cultural institutions located on a museum route may be able to exploit the attractiveness of a main museum located

in the neighbourhood, isolated museums cannot rely on visitor flows originating from main museums for accessibility reasons. Thus, they can only take advantage of spillover effects originating from similar small-sized museums in the surroundings.

In order to investigate the impact of non-spatial networking practices, we include two dummy variables in the model specification: *Partner* for museums with formal relationships of collaboration and/or partnership with other cultural institutions and *Network* for museums with a management structure integrated with one of the other museums or cultural institutions.[2] As controls, we consider a matrix $\boldsymbol{V}$, with associated parameter vector $\boldsymbol{\zeta}$, identifying museums' characteristics, services offered to visitors and support available for the visit. In particular, we take into account whether the museum is a main museum (i.e., most visited museum of the province) by including the dummy variable *MainMuseum* and we consider the presence of UNESCO sites in 30-min driving time by inserting the dummy variable *UNESCOsites*. Then, we include three dummy variables for museum managerial structure (*Public* for public museums and *ExclusiveDirector* and *CreativeDirector* for museums with, respectively, a director and a scientific curator exclusively assigned), a set of dummies for museum typology (*Monument*, *Eco-Museum*, *ArchaeologicalPark*, with *Gallery* as reference category), five dummy variables capturing museums that are open all year long (*AnnualOpening*), with a seasonal opening (*SeasonalOpening*), open for at least 24h a week (*OpeningHours*) and for at least 100 days a year (*OpeningDays*), and with completely free entrance (*FreeAccess*), and a dummy variable identifying museums that carried out communication and promotion campaigns (*Communication*). Moreover, we control for the logarithm of the surface area of the exhibition space (*Log_exhibition*) and the logarithm of the number of employees (*Log_employees*). We also include several dummy variables identifying the visitor supports provided by each museum (e.g., printed informative materials, audio and video guides, smartphone apps and interactive installations) and the services available onsite such as parking, cafés, bookshops, online catalogues and tickets, handicap facilities and social media accounts. Finally, a set of dummy variables for the Italian NUTS 1 regions (*North-West*, *North-East*, *South-Islands*, with *Centre* as reference group) is introduced in order to account for regional differences. The complete list of the variables considered in the analysis, along with their description, can be found in Table A1 in Appendix S1.

5 | EMPIRICAL FINDINGS

5.1 | Main results

In order to address the first and second research questions, we estimate both spatial and non-spatial models including *Partner* and *Network* as explanatory variables. Since the coefficients related to the explanatory variables included in spatial models are not directly interpretable due to the presence of the spatial lag of the dependent variable (LeSage & Pace, 2009), in the second and third columns of Table 2 we show the marginal direct effects. For this reason, for spatial models, the estimate of the constant is not reported.

To answer our first research question, we analyse the role of non-spatial networking practices in affecting the level of competitiveness of Italian museums. The estimation results in the first and third columns of Table 2 indicate that both networking practices contribute to increasing museums' attractiveness, with a slightly greater effect for *Network* (0.19) than for *Partner* (0.17). Thus, both integrated management structures and partnerships help increase visitor flows to museums. Indeed, partnerships among museums reduce costs and provide wider access to initiatives, projects and resources, resulting in an extended user base (Scrofani & Ruggiero, 2013). The positive effect of networking may depend on increased access to information, skills and experiences, all of which are valuable for

[2]The variable *Partner* corresponds to the question: "In the last three years (since 2015), the museum/institute has had formal collaborative and/or partnership relationships with other public or private cultural institutions present in the territory or has joined integrated cultural services networks/systems?" while *Network* relates to: "Is the management of the structure implemented in an integrated form with other museums/institutions through formal acts which involve the sharing of human, technological or financial resources?"

TABLE 2 Estimation results.

	Non-spatial networking		Spatial model		Both	
	Coeff.	SD	Coeff.	SD	Coeff.	SD
ρ	-	-	0.13***	0.04	0.13***	0.04
Partner	0.17***	0.06	-		0.17***	0.06
Network	0.19***	0.06	-		0.18***	0.06
MainMuseum	1.89***	0.19	1.92***	0.17	1.93***	0.17
UNESCOsites	0.22***	0.06	0.19***	0.05	0.18***	0.06
Public	0.76***	0.11	0.77***	0.10	0.75***	0.10
North-West	0.09	0.07	0.08	0.07	0.09	0.07
North-East	0.14**	0.07	0.12*	0.07	0.13*	0.07
South-Islands	−0.07	0.07	−0.04	0.07	−0.02	0.07
ArchaeologicalPark	−0.11	0.10	−0.10	0.10	−0.11	0.10
Monument	0.95***	0.09	0.95***	0.08	0.94***	0.08
Eco-museum	−0.05	0.19	−0.02	0.20	−0.04	0.20
AnnualOpening	1.91***	0.13	1.94***	0.11	1.90***	0.11
SeasonalOpening	1.78***	0.13	1.80***	0.11	1.77***	0.11
OpeningHours	0.79***	0.06	0.79***	0.06	0.79***	0.06
OpeningDays	0.39***	0.05	0.39***	0.06	0.38***	0.06
FreeAccess	0.28***	0.06	0.28***	0.06	0.28***	0.06
Log_exhibition	0.22***	0.02	0.22***	0.01	0.22***	0.01
Log_employees	0.33***	0.03	0.33***	0.03	0.33***	0.03
ExclusiveDirector	0.04	0.05	0.02	0.07	0.05	0.07
ScientificCurator	−0.02	0.07	−0.03	0.07	−0.04	0.07
Communication	−0.05	0.06	−0.00	0.06	−0.05	0.06
Constant	1.25	0.08	-	-	-	-
Services	Yes		Yes		Yes	
Supports to the visit	Yes		Yes		Yes	
N	4908		4908		4908	
LL	−9432.16		−9420.76		−9410.64	
AIC	18,944.31		18,921.51		18,905.28	

Note:
*p value ≤0.10, **p value ≤0.05, and ***p value ≤0.01.

improving museums' attractiveness and positioning at the international level. Social contacts, relationships, shared values and the commitment to common goals are other fundamental aspects of networking practices. Positive externalities of coordinated museums also arise from the development of intercultural skills that act as a catalyst for knowledge specialization and enhance museum levels of expertise.

Since institutional aspects and museums' typology may be strictly linked to museums' ability to co-operate (Bertacchini et al., 2018), we analyse weather museums' ownership structure and typology influence their ability to establish effective partnerships and networks. Regarding museums' ownership structure, we include in the model specification interactions between *Partner* and *Network* and a categorical variable identifying national, regional and municipal public museums as well as private museums managed either by a private body or a private subject. The

estimation results shown in Table B9 of Appendix S2 indicate that public national and regional museums as well as private museums managed by a private company are able to establish more effective partnerships compared to others. Meanwhile, municipal public museums and private museums owned by private subjects benefit more from networking practices. Concerning museums' typology, we evaluate weather different types of museums benefit differently from non-spatial networking practices by including in the model specification interaction terms between *Partner* and *Network* and a categorical variable identifying art, history and other museums, archaeological areas and monuments. The estimation results contained in Table B10 of Appendix S2 show that partnership agreements are more effective for museums (especially art museums and others) compared to monuments and archaeological areas, while networking mostly favour the attractiveness of history museums.

To respond to the second research question on the existence of spatial effects arising from neighbours, we estimate a SAR model as shown in the second and third columns of Table 2. The estimate of ρ, capturing the overall level of spatial dependence, is positive and significant (0.13), indicating that agglomeration effects exist among nearby museums rather than competition. Thus, the presence of multiple museums in an area strengthens the position of each, resulting in increased visitor flows. This result aligns with Pompili et al.'s (2019) finding on the existence of positive spatial effects between neighbouring Italian provinces in terms of tourism flows.

Regarding the control variables, as expected, main museums perform better than others in terms of number of visitors (i.e., almost doubling the number of visitors) and, in line with Panzera et al. (2021), the presence of UNESCO sites is significantly and positively correlated with the attractiveness of museums located nearby. Moreover, we find that public museums perform better than private ones in terms of number of visitors and that museums located in the North of Italy attract a larger number of visitors than those in the Centre, followed by museums located in the South and the Islands. Considering museum typology, Table 2 indicates that monuments and galleries are more attractive than archaeological parks and eco-museums. As expected, the total number of visitors shows a positive association with the number of opening days and hours, increasing for annual and seasonal openings compared to sporadic openings. Moreover, bigger museums (i.e., museums with larger exhibit spaces and number of employees) tend to host a greater number of visitors. We also find that offering a completely free admission has a positive and statistically significant effect, whereas communication and promotional campaigns do not exhibit a significant relationship with museum attractiveness. Similarly, having a director or a scientific curator exclusively assigned to the museum is not significantly correlated with the museum's performance. In terms of visitor support, we observe a positive and significant connection between the total number of visitors and the availability of signposts, informative materials, audio and video guides, virtual setups and time indication while smartphone apps and materials for disabled children are not significantly related to a museum's attractiveness. The services offered onsite, including restaurants, snack machines, bookshops, childcare, handicap facilities, websites, online tickets and catalogues and social media accounts are positively and significantly connected with the total number of visitors. Findings on the positive association between museum attractiveness and technological innovations (multimedia devices and smartphone and tablet apps) and digital services (websites, online catalogues, online ticket offices, social media accounts, etc.) are in line with those of Guccio et al. (2020) and Palumbo (2022). For further details on emerging patterns in museums' adoption of technological innovations, see Bertacchini and Morando (2013).

5.2 | Results by museum location typology

In this subsection, to address the third and fourth research questions, we differentiate the analysis between museums located in highly attractive and remote areas. First, to evaluate whether the role of non-spatial collaboration practices varies across different location typologies, we include in the non-spatial model the interaction of *Partner* and *Network* with a dummy variable (*Route*) which equals 1 for museums situated along a museum route and 0 otherwise. Then, we analyse whether spatial effects change according to the different location typologies (i.e., highly attractive and remote areas). To achieve this goal, we first consider spatial effects occurring across

museums located in the neighbourhood of a main museum by identifying neighbouring units as museums belonging to the same route. Then, we concentrate on spatial effects generating among museums located in isolated areas, defining neighbours as those museums that do not belong to a route based on the distance separating them. Moreover, when analysing highly attractive areas, in order to consider how the size of local attractive clusters influences museums' visitor flows, we include two variables in the model: the logarithm of the number of municipalities crossed by the routes (*Log_municipalities*) and the length of the routes (*Log_length*), where they take on non-zero values for museums on a route and 0 otherwise.

The results shown in the first, third and fifth columns of Table 3 indicate that the positive effect of partnerships is larger for remote museums while the opposite holds for *Network*. This may depend on the fact that through partnership agreements, smaller and more remote museums can enhance their visibility and reputation to a greater extent than museums located in highly attractive areas. For instance, by offering virtual reconstructions of collections that have been divided over time or works of an artist scattered across multiple museums, smaller museums can expand their offerings and compete on the same level as larger structures (Scrofani & Ruggiero, 2013). On the other hand, integrated management structures may lead museum managers to invest more in accessible, profitable and already visited structures, rather than focusing on smaller museums, resulting in positive yet diminished effects.

Considering spatial interactions occurring in highly visited areas, the results presented in the second and third columns of Table 3 indicate that positive spatial effects (0.10) are observed among neighbouring museums located on museum routes. Thus, Italian museums benefit from being situated in highly touristic territories, leading to increased visibility and accessibility, thus enhancing their capacity to attract visitors. However, the estimates of *Log_municipalities* (−0.10) and *Log_length* (−0.04) suggest that as the extent of local networks expands, museum attractiveness tends to decline. Thus, museums making the most of agglomeration economies are those located in close proximity to main museums, as spatial effects tend to diminish at greater distances. This insight may depend on dispersion issues caused by accessibility reasons and a decreased willingness among museum users to travel further away from the main sites. The strength of spillover effects in local and concentrated spatial clusters is further confirmed by comparing the previous estimate of ρ referring to all global interactions (0.13) with those for attractive clusters (0.10), since the level of spatial dependence is preserved concentrating on restricted areas around the main museums. On the other hand, museums situated in remote areas (fourth and fifth column of Table 3) do not benefit from spillover effects in terms of number of visitors from neighbouring museums, meaning that in less accessible areas, visitor flows tend to concentrate on specific points of interest and do not spread across the entire territory. In sum, spatial effects reach their highest magnitude within very local clusters and then tend to diminish and become non-significant as the distance from the main sites increases. Hence, policies aimed at exploiting spillover effects in terms of visitor flows should account for museums' location since spatial effects primarily generate from highly visited structures and vary across the territory.

5.3 | Robustness check

To validate our results, we provide several robustness checks, considering: (i) different measures for museums' output; (ii) the main characteristics of the territory where museums are located; (iii) alternative definitions for attractive areas; (iv) different modelling approaches for non-spatial collaboration; and (v) other possible spatial models.

First, we estimate the model in Equation (1) considering four alternative dependent variables as proxies for museums' performance and attractiveness. Specifically, we consider *Log_Revenues* and *Log_PayingVisitors* representing respectively the logarithm of the total revenues in the year generated from ticket sales (in euros) and the logarithm of the total number of paying visitors. Note that only 58% of total visitors paid a ticket; thus, we expect some differences from the results obtained by estimating the main model. We also consider as further possible outcomes the logarithm of the total number of Italian (*Log_Italians*) and foreign visitors (*Log_Foreign*). The estimation results are presented in Appendix S2 in Table B1 for *Log_Revenues* and *Log_PayingVisitors* and in Table B2 for

TABLE 3 Estimation results by location typology.

	Non-spatial networking	Attractive areas		Remote areas	
ρ	-	0.10*** (0.02)	0.10*** (0.02)	0.00 (0.01)	−0.01 (0.01)
Partner × Route = 0	0.21*** (0.07)	-	-	-	0.16** (0.08)
Partner × Route = 1	0.14* (0.07)	-	0.08 (0.08)	-	-
Network × Route = 0	0.16** (0.08)	-	-	-	0.15* (0.09)
Network × Route = 1	0.20*** (0.08)	-	0.17** (0.08)	-	-
Log_municipalities	-	−0.10** (0.04)	−0.08** (0.04)	-	-
Log_length	-	−0.04** (0.02)	−0.05*** (0.02)	-	-
MainMuseum	1.91*** (0.18)	1.93*** (0.18)	1.93*** (0.18)	1.89*** (0.18)	1.90*** (0.18)
UNESCOsites	0.25*** (0.06)	0.23*** (0.07)	0.22*** (0.07)	0.26*** (0.07)	0.27*** (0.07)
Public	0.76*** (0.10)	0.76*** (0.10)	0.75*** (0.10)	0.79*** (0.10)	0.78*** (0.10)
North-West	0.08 (0.07)	0.12* (0.07)	0.12* (0.07)	0.06 (0.07)	0.07 (0.07)
North-East	0.14** (0.05)	0.14** (0.07)	0.14** (0.07)	0.12** (0.07)	0.13** (0.07)
South-Islands	−0.07 (0.07)	−0.07 (0.07)	−0.07 (0.07)	−0.09 (0.07)	−0.08 (0.07)
ArchaeologicalPark	−0.11 (0.11)	−0.10 (0.10)	−0.11 (0.10)	−0.10 (0.11)	−0.11 (0.11)
Monument	0.95*** (0.08)	0.95*** (0.08)	0.95*** (0.08)	0.95*** (0.08)	0.95*** (0.08)
Eco-museum	−0.05 (0.20)	−0.06 (0.20)	−0.08 (0.20)	−0.04 (0.20)	−0.03 (0.20)
AnnualOpening	1.91*** (0.11)	1.93*** (0.10)	1.92*** (0.10)	1.94*** (0.11)	1.92*** (0.11)
SeasonalOpening	1.77*** (0.11)	1.80*** (0.11)	1.78*** (0.11)	1.80*** (0.11)	1.79*** (0.11)
OpeningHours	0.79*** (0.06)	0.78*** (0.06)	0.78*** (0.06)	0.79*** (0.06)	0.79*** (0.06)
OpeningDays	0.39*** (0.06)	0.39*** (0.06)	0.39*** (0.06)	0.39*** (0.06)	0.39*** (0.06)
FreeAccess	0.28*** (0.06)	0.28*** (0.06)	0.29*** (0.06)	0.28*** (0.06)	0.28*** (0.06)
Log_exhibition	0.22*** (0.01)	0.22*** (0.01)	0.22*** (0.01)	0.22*** (0.01)	0.22*** (0.01)
Log_employees	0.33*** (0.03)	0.33*** (0.03)	0.33*** (0.03)	0.34*** (0.03)	0.33*** (0.03)
ExclusiveDirector	0.05 (0.07)	0.02 (0.07)	0.04 (0.07)	0.02 (0.07)	0.04 (0.07)
ScientificCurator	−0.03 (0.07)	−0.03 (0.07)	−0.04 (0.07)	−0.01 (0.07)	−0.02 (0.07)
Communication	−0.05 (0.06)	−0.00 (0.06)	−0.05 (0.06)	−0.00 (0.06)	−0.05 (0.06)
Constant	1.24 (0.08)	-	-	-	-
Services	Yes	Yes	Yes	Yes	Yes
Supports to the visit	Yes	Yes	Yes	Yes	Yes
N	4908	4908	4908	4908	4908
LL	−9431.71	−8383.32	−8382.24	−9438.07	−9434.27
AIC	18,947.41	16,850.65	16,848.48	18,960.14	18,956.54

Notes: Standard error in brackets.
*p value ≤0.10, **p value ≤0.05, and ***p value ≤0.01.

Log_Italians and *Log_Foreign*. The estimates of ρ confirm the presence of positive and significant spatial dependence at the overall level and in highly attractive areas. In particular, the SAR parameter remains consistent in magnitude with previous estimates for revenues (0.13) as the outcome while is higher for paying visitors (0.19) and foreign visitors (0.27) and smaller for Italian ones (0.06). Moreover, we observe some differences with previous results for remote areas since ρ is very small in magnitude but significant for *Log_PayingVisitors* (0.04), *Log_Revenues* (0.05) and

Log_Foreigners (0.04) as dependent variables. This suggest that visitors who paid the ticket as well as foreigners are more willing to move across the territory regardless of the distance separating cultural institutions while Italians seem to be more selective in their choice of which museum to visit. Considering *Partner* and *Network*, we find positive effects for *Network* on the number of paying visitors while the impact of *Partner* is negative albeit negligible (significant at a 10% significance level). Differentiating between Italian and foreign visitors, we find that partnerships and networking practices are highly effective for Italian visitors, whereas the effect on foreigners is non-significant. This difference may primarily arise from communication issues with foreign visitors who may not be well-informed about the opportunities offered by museums. Moreover, it is common for cultural institutions to offer special packages or promotions to local residents to boost visitor numbers during low touristic seasons and periods of low attendance. Finally, we confirm previous findings on the higher effect of partnerships on museums located in isolated areas and of networking for museums in attractive clusters.

As a second robustness check, we verify whether different characteristics of the areas where museums are located could affect their level of attractiveness paying particular attention to tourism flows. For this purpose, we expand the set of control variables of the model to include additional information on: (i) tourism infrastructure (i.e., number of beds), as higher availability of tourism accommodations may positively influence tourists' length of stay and their propensity to visit multiple museums in the area; (ii) the urbanization degree of the area (i.e., population density), used as a proxy for local tourism competitiveness, assuming that higher urbanization leads to an increased number and variety of attractions; (iii) the economic conditions of the territory (i.e., employment rate), used as a proxy for the presence of infrastructures that may impact museum accessibility (Houston & Ong, 2013); and (iv) the distance to the nearest airport, as it can significantly affect the number of visitors, especially foreign ones. Concerning airports, we include in the model specification either the logarithm of the distance to the nearest international airport or the logarithm of the distance to the nearest airport with at least four million passengers based on 2022 data (a list of these airports can be found in Table A3 of Appendix S1). The estimation results reported in Table B3 of the Appendix S2 highlight that between the four additional variables included in the model, only municipal tourism offer (i.e., number of beds) and airport distance have a significant effect (positive for tourism offer and negative for distance from major airports) on museum attractiveness, albeit of relatively low intensity. Overall, the estimates of all other variables as well as of the level of global spatial dependence result to be stable in both models confirming previous findings.

Third, we check the robustness of our results to different definitions of attractive areas. As an alternative to museum routes identified by ISTAT, we consider municipal clusters. Museums belonging to municipal clusters are defined either as those museums located in the same municipality as a main museum or as museums in municipalities containing at least three cultural institutions with at least one hosting more than 100,000 visitors. Remote areas are then defined as all other areas except municipal clusters or, as an alternative, in the former case a three-group categorization is used where the middle category is given by cultural institutions belonging to a museum route but not located in the same municipality of a main museum. In this way, rather than considering as clusters large routes navigable by car, we restrict the analysis to smaller areas that could be managed locally by mayors and accessed by visitors through local public transport. The estimation results can be found in Table B4 of Appendix S2 for the definition of attractive areas based on the position of the main museums and in Table B5 of Appendix S2 for the categorization depending on the number of museums in the municipality and their size. The spatial weight matrices used in both robustness checks are inverse distance matrices applied to the different groups of neighbours considered. Using both definitions of clusters, we confirm the existence of positive and significant spatial effects in attractive areas in terms of the number of visitors, although with reduced intensity compared to the previous estimates, likely due to the lower number of neighbours identified using a municipal-based criterion.[3] Moreover, we detect significant

[3]Museums located in municipal clusters are 855 if clusters are built based on the location of main museums and 878 if clusters are defined by the number of museums in the municipality and their size. Thus, 4053 museums are defined as remote using the former approach (of which 1836 are in the middle category) and 4030 with the latter. Differently, following the museum route categorization, 2691 cultural institutions belong to attractive clusters and 2217 to remote areas.

competition effects (i.e., negative spatial dependence) in remote areas probably because several highly visited structures belonging to museums routes are classified as "remote" and considered neighbours to cultural institutions that are really isolated and poorly visited. Indeed, when we split the remote category between museums belonging to routes but not to municipal clusters and museums belonging neither to municipal clusters nor routes, we find no evidence of significant spatial dependence at the overall level in either category. Thus, this robustness check further strengthens the idea that museum routes should be considered as a relevant dimension for managing spatial interactions, even though most spatial effects occur in close proximity to the main museums.

Fourth, we check the robustness of our findings regarding the positive effect of non-spatial interactions using an alternative modelling approach to define museums involved in a partnership or network. Instead of using the *Partner* and *Network* dummy variables, which only indicate whether a museum is part of a network or partnership, we estimate the autoregressive model using a non-spatial weight matrix. In this matrix, all entries are set to zero except for museums involved in a partnership or network, which are set to one to account for the specifics of the interaction. The estimation results contained in Table B6 of Appendix S2 confirm the positive and significant effect of non-spatial interactions among museum, even by using this alternative modelling approach. However, we prefer the dummy variable approach since the AIC information criteria slightly increases from 18,944.31 to 18,952.04 passing from the ordinary least squares (OLS) to the SAR regression while the goodness of fit of the model remains unchanged ($R^2_{OLS} = R^2_{SAR} = 0.71$). Moreover, the simpler dummy variable specification allows to analyse how non-spatial co-operation practices differently impact the attractiveness of museums depending on their ownership structure and typology by including in the model some interaction terms as shown in Tables B9 and B10 of Appendix S2.

Finally, we estimate the model using alternative spatial specifications. In particular, rather than using a SAR specification, we estimate a spatial error model (SEM) and a comprehensive model that includes both the spatial lag of the dependent variable and of the error term (SARAR). When estimating a SEM specification, the estimates of the parameter related to the spatial lag of the error (λ) in Table B7 of Appendix S2 indicate the presence of positive and significant spatial dependence related to the residual component both at the overall level and for attractive areas. Similarly, when considering a SARAR spatial specification, we find positive and significant spatial effects related to both the dependent variable and the error, with a similar magnitude to the SAR estimates for ρ. Thus, our findings on the existence of global spatial dependence overall and for attractive areas in terms of number of visitors are confirmed by using different spatial specifications. Moreover, the estimated effects of the covariates included in the model are robust to the different modelling approaches. In Table B8 of Appendix S2, we compare the different spatial specifications using a Lagrange multiplier test. The results do not provide a clear indication of which spatial model better fits our data (we reject both the robust LM error and lag test). Nonetheless, in this work, we select the SAR specification because it provides a meaningful economic interpretation of spillovers in terms of visitors' diffusion in space, which is not possible estimating SEMs.

6 | CONCLUSIONS

In addition to the traditional activities of conservation and opening museum collections to the public, cultural heritage plays a crucial role in promoting tourism and economic development of local territories (Frey & Meier, 2006). In recent years, public policies have increasingly focused on encouraging co-operation between museums to strengthen their active role as drivers of economic and social development in their local context. Nevertheless, to date, the role of non-spatial co-operation and spatial interactions between museums remains a partially unexplored topic of research. Therefore, in this work, we investigate the role of spatial effects and networking practices in determining the attractiveness of Italian museums. To perform the analysis, we take advantage of spatial econometric techniques and use geolocated data on the main characteristics of Italian museums as well as information on museum routes merging two ISTAT datasets, the 2018 census survey of Italian museums and "Museum routes in Italy in 2018." In

particular, we employ information on museum routes to disentangle the differential impact of spatial and non-spatial forms of collaboration on museums located in highly attractive or remote areas.

Our results offer different interesting insights. First, we find that being part of a network through an integrated management structure as well as partnerships with other cultural institutions contributes to enhanced museum performance (Q1). In particular, while partnerships tend to benefit more remote museums, cultural institutions located in attractive areas tend to gain greater advantages from integrated management structures (Q3). Second, being located near attractive sites positively influences the performance of neighbouring museums from a global perspective (Q2). Nevertheless, differentiating the analysis considering the level of attractiveness of the local area, we find that instead of enhancing the attractiveness of remote museums, spatial effects appear to be more effective for structures situated in very attractive territories (Q4). Moreover, we also identify negative effects related to the extent of local attractive clusters, further highlighting the detrimental impact of distance on spillovers in terms of visitor flows. Thus, synergies among neighbouring Italian museums prevail in close proximity to the main museums, but their effectiveness tends to decrease with distance and becomes ineffective in isolated areas. These results are confirmed also considering alternative definitions of attractive area such as "municipal clusters" rather than using the museum routes categorization.

Additional results pertain to the relevance of onsite services available and visit support such as technological innovations and digital and accessibility services for museums' competitiveness. Moreover, larger exhibition areas, extended opening days and hours and free admission policies are closely associated with museum performance. On the other hand, we do not detect any significant effects related to communication campaigns or the presence of scientific curators or directors exclusively assigned to museums.

Our findings suggest several policy directions. First, given the relevant role of non-spatial networking in enhancing the competitiveness of Italian museums, public policies should focus on further promoting coordination among Italian museums. Local authorities should facilitate and support the creation of collaboration practices, in particular for museums in remote areas, as partnerships and alliances are the most effective strategies for this types of structures. In particular, to address the issues related to isolated locations, small size and distance from highly visited structures, policy-makers could implement measures aimed at equipping isolated museums with technological devices that can remotely connect them with larger institutions, thereby expanding their reach and competitive capabilities. Second, policies and plans aimed at supporting the role of museums as promoters of social and economic development should leverage existing positive spatial interactions between neighbouring museums to increase their effectiveness and achieve large scale results, especially in areas with high visitor flows. In particular, as suggested by Mizzau and Montanari (2008), successful cultural policies should strengthen the connection between a cultural cluster and its local context, enhancing its authenticity, uniqueness and distinctiveness, which are crucial factors in revitalizing the attractiveness of a particular geographic area. However, given the localized nature of agglomeration effects as indicated by our findings on the negative influence of the length of museum routes on museums' attractiveness, public governance should work on local mobility plans and improve transportation to facilitate visitors travel to museums that are not in close proximity to main institutions. Establishing efficient mobility solutions that integrate highly visited museums and more remote sites is essential to ensure easy access while preserving the local heritage and addressing potential risks related to over-tourism in highly visited areas (Cerisola & Panzera, 2022b). Marketing strategies should also focus on increasing the visibility of smaller sized museums and facilitating visitor movement between highly attractive local hubs and more isolated areas. In this context, connecting all the places of cultural interest and promoting lesser known sites, could allow: (i) distributing visitors facing issues related to overcrowded cultural sites; (ii) enhance the attractiveness of those museums which are unable to make the most of their potential for various reasons (size, type, accessibility, promotion or location); and (iii) insert museums that have more visitors into a cultural network linked to local places of culture or nature in the area to strengthen their local identity.

In sum, local stakeholders should invest in the creation of cultural districts to valorize their cultural heritage assets, ensure an equal distribution of tourists and achieve common development goals (Le Blanc, 2010). Cultural districts with integrated projects and shared objectives can sustain the cultural and environmental tourism supply chain

and benefit the entire local economy by increasing infrastructure investments, providing incentives for businesses and implementing labour market programmes that lead to long-term sustainable growth (Brandano & Crociata, 2023). However, territorial governance should be aware that spatial discontinuities and geographical heterogeneity can pose serious challenges, as shown by the disappearance of spatial effects outside the boundaries of municipal clusters. Thus, it is fundamental to face territorial fragmentation with an effective communication system concerning both transport infrastructures and marketing campaigns. Strong political support is required to reach large scale objectives and ensure long-lasting regional development, taking into account the diverse features and spatial patterns characterizing cultural districts (Dellisanti, 2023).

Despite this research has been carried out on the Italian museum system, it can provide a useful methodology for assessing the role of spatial and non-spatial interactions among museums also for other European countries. Indeed, in the last decades, a number of projects have been financed or supported by the Council of Europe with the aim of favouring the cultural, social and economic value of museums through the definition of cultural routes. In this framework, our study proposes a modelling approach for analysing the role of museum routes in their territorial context that may be of interest also outside Italy. We expect our results to be confirmed in other EU countries although with different intensities linked to the specific characteristics of the territory and current legislation. However, empirical applications to other countries or contexts could be helpful in confirming the relevance and magnitude of our findings.

For future extensions of this work, it would be also interesting to analyse the temporal dynamics using a panel dataset and estimate spatial panel data model. Merging 2018 data with more recent information would also allow us to analyse the effect of the pandemic on Italian cultural institutions and whether spillover effects contributed to mitigating the negative impact of Covid-19 on visitor flows. Moreover, using panel data, it would be possible to measure more precisely the effect of different museums characteristics such as services offered and supports for the visit on museums' performance by using time lagged variables.

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SUPPORTING INFORMATION

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Resumen. Dada la relevancia de los museos en la promoción del desarrollo cultural, turístico y económico de los territorios locales, se investigó la influencia de las interacciones espaciales y no espaciales en el atractivo de los museos. En concreto, se evaluó si las colaboraciones no espaciales, como las asociaciones y la creación de redes, contribuyen a mejorar su nivel de competitividad y si se produce una dependencia espacial entre museos vecinos. Además, se hicieron diferencias en el análisis considerando varias tipologías de ubicación, es decir, emplazamientos situados en zonas muy atractivas y en zonas remotas. Las conclusiones de este estudio pueden ayudar a los responsables políticos a diseñar estrategias *ad hoc* para fomentar el papel activo de los museos en su contexto local.

抄録: 地域における文化、観光及び経済発展の促進において博物館が重要であることを踏まえ、博物館の魅力に及ぼす空間的及び非空間的な相互作用の両方の影響を検討する。特に、パートナーシップやネットワークといった非空間的な協力が、それらの競争力のレベルを高めることに貢献しているかどうか、また、近隣の博物館どうしの間で空間的依存が発生しているかどうかを評価する。さらに、様々な立地類型、すなわち、非常に魅力的でありながら辺鄙な地域の場所を考慮することによって分析の差別化を行った。本知見は、地域の状況において博物館の有効な役割を奨励するためのアドホック戦略を立案する政策立案者を支援するものである。